15th EuCornea Annual Congress

24-26 May 2024

ABSTRACTS

Corneal Transplantation
&
Keratoprosthesis

Abstract #001

Outcome of endothelial keratoplasties for the indication of bullous keratopathy using overseas donor cornea

M. Ahad*[a]

[a] *KING KHALED EYE SPECIALIST HOSPITAL, Riyadh, SAUDI ARABIA*

** Presenting author (ahad.muhammad@gmail.com)*

Purpose

The purpose of this study was to compare the clinical outcomes of preloaded DMEK (Descemet's membrane endothelial keratoplasty) with that of preloaded DSAEK (Descemets's stripping automated endothelial keratoplasty) and standard surgeon-cut and pre-cut DSAEKs

Setting

Tertiary eye care centre in the Middle East

Methods

Retrospective study of all cases of endothelial keratoplasty (EK) performed by a single surgeon for the indication of bullous keratopathy. Exclusion criteria were a follow-up of fewer than 3 months and an indication of EK other than bullous keratopathy. The main outcome measures were primary failure and long-term failure rates. All the donor cornea were acquired from USA eye banks. In case of preloaded or pre-cut tissue, the processing was done in the USA and the tissues were shipped to Saudi Arabia There were four categories
1) Preloaded DMEK, 2) Preloaded DSAEK, 3) Pre-cut DSAEK and 4) Surgeon-cut DSAEK

Results

There were total of 144 cases of EK performed for bullous keratopathy. 40 underwent DMEK, 38 preloaded DSAEK, 24 pre-cut DSAEK, and 42 surgeon cut DSAEK. Primary failure rate was 2.5%, 5.2%, 50% and 9.5% respectively. There was a strong correlation between primary failure and the duration of the interval between tissue processing and transplantation in pre-cut DSAEK. No such correlation was seen in the preloaded DMEK group. Other risk factors for primary failure were previously failed graft, presence of fibrotic membranes in the anterior chamber. Risk factors for long-term failure were non-DMEK EK, presence of glaucoma, and drainage tubes.

Conclusions

Compared to all types of DSAEKs, preloaded DMEK has a very good outcome in cases of bullous keratopathy. DMEK with longer preservation and processing-to-transplant time has no effect on clinical outcome, unlike pre-cut DSAEK.

Financial Disclosure of all authors

None

Abstract #002

BEVACIZUMAB “BIG BUBBLE”

L. Alcalde Blanco*[a], P. Alonso Barrientos[b], M. Puchol Rizo[a], MC. De Uña Iglesias[a], D. Burón Pérez[c], MJ. Suárez Fernández[a]

[a] HOSPITAL UNIVERSITARIO 12 DE OCTUBRE, Madrid, SPAIN ; [b] Hospital Central de la Cruz Roja San José y Santa Adela, Madrid, SPAIN ; [c] HOSPITAL UNIVERSITARIO DE LEÓN, León, SPAIN

** Presenting author (luisalcaldeblanco93@gmail.com)*

Purpose

To describe a complication during intraestromal corneal bevacizumab injection for neovascularization treatment in a patient with deep anterior lamellar keratoplasty (DALK).

Setting

Hospital Universitario 12 de Octubre, Madrid, Spain.

Report of case

Our patient is a 65-year-old male who underwent a DALK surgery secondary to corneal chemical injury with sodium hidroxyde. He developed corneal neovascularization, which is being treated with periodical intraestromal bevacizumab injections. In one of these procedures the drug created a “big bubble” detaching the pre-existing cleavage plane of the lamellar keratoplasty. An air bubble was placed in the anterior chamber to promote reattachment. The following day the bubble remained without changes, but after 8 days, it had totally reabsorbed itself. Corneal neovessels partially reduced, but recurred in the follow-up.

Conclusion/Take home message

Although bevacizumab intrastromal injections are a useful and usually safe procedure to treat corneal neovascularization, they are not free of complications. Eyes with prior surgeries, particularly lamellar keratoplasties, are at a higher risk for complications, and injection site selection and injection should be carefully performed.

Abstract #003

Corneal intrastromal AAV8 delivery of human SLC4A11 gene rescues corneal edema in *Slc4a11*$^{-/-}$ mouse model of Congenital Hereditary Endothelial Dystrophy

A. Aldave*[a], W. Zhang[a], D. Chung[a], M. Hirsch[a]

[a] *THE UNIVERSITY OF CALIFORNIA, LOS ANGELES, Los Angeles, UNITED STATES*

** Presenting author (aldave@jsei.ucla.edu)*

Purpose

Congenital Hereditary Endothelial Dystrophy (CHED) is caused by biallelic mutations in *SLC4A11*. The *Slc4a11*$^{-/-}$ mouse model recapitulates the clinical phenotype of CHED, characterized as progressive corneal edema and corneal endothelial dysfunction. We evaluated the efficacy of intrastromal delivery of a recombinant AAV8 vector encoding human SLC4A11 cDNA under transcriptional control of human elongation factor-1 alpha promoter - rAAV8-EF1a-hSLC4A11.

Setting

Slc4a11$^{-/-}$ mouse model of Congenital Hereditary Endothelial Dystrophy (CHED)

Methods

A single corneal intrastromal injection of 3 µL rAAV8-EF1a-hSLC4A11 vector was performed in one eye of *Slc4a11*$^{-/-}$ mice at 4 weeks of age. Three dosages 10e9 (n=13), 10e8 (n=10), 10e7 vg/eye (n=9) were tested. For each mouse, the eye receiving the AAV injection was randomized, and the contralateral eye served as the control. Anterior segment OCT was performed in both eyes before injection to measure baseline central corneal thickness (CCT, mean ± SEM) and bi-weekly after injection until post-injection week 8. Slit-lamp examination of the anterior ocular segment and retinal OCT were also performed bi-weekly post-injection.

Results

AAV injected eyes showed a sustained reduction of CCT from baseline in a dose-dependent manner. For 10e9 vg/eye group, CCT at baseline and post-injection week 8 were 161.1 ± 3.3 µm and 144.8 ± 6.5 µm (p=0.02) in AAV injected eyes and 160.2 ± 2.7 µm and 197.2 ± 6.6 µm (p<0.0001) in contralateral control eyes. For 10e8 vg/eye group, the CCT at baseline and post-injection week 8 were 162.5 ± 3.2 µm and 153.6 ± 1.9 µm (p=0.03) in AAV injected eyes and 166.7 ± 5.2 µm and 177.3 ± 4.2 µm (p=0.20) in contralateral control eyes.

Conclusions

Intrastromal delivery of rAAV8-EF1a-hSLC4A11 effectively rescues corneal edema in *Slc4a11*$^{-/-}$ mice, indicating a functional recovery of corneal endothelial pump function. These results provide in vivo evidence of the utility of AAV gene therapy for treating CHED associated with *SLC4A11* mutations.

Financial Disclosure of all authors

Research funding provided by the California Institute for Regenerative Medicine

Abstract #004

Pseudochamber Protected Keratoplasty (PPK) with EndoK® implant

JF. Alfonso Sanchez*[a], B. Alfonso-Bartolozzi[a], L. Fernandez-Vega Cueto[a], C. Lisa Fernandez[a]

[a] *IOFV, Oviedo, SPAIN*

** Presenting author (j.alfonso@fernandez-vega.com)*

Purpose

To present the Pseudochamber-Protected Keratoplasty (PPK) with the new Endo-K Pro ® implant technique and report the clinical outcomes in patients at high risk for penetrating keratoplasty (PK).

Setting

Prospective study

Methods

A prospective non-comparative study was performed in patients with full-thickness corneal diseases with or without previous intraocular surgery, including those secondary to chemical/thermal or physical trauma or with failed corneal graft. Only cases with no history of PK and with at least 12 months of follow-up were included.

Graft survival was the primary outcome (defined as a clear graft with an endothelial cell density (ECD) >500 cel/mm 2). Central corneal thickness (CCT), corrected distance visual acuity (CDVA), intraocular pressure (IOP), and complication rate were the secondary outcomes.

Results

Twenty-five eyes were included. Most were male (68%), with a mean age of 67.5±12.9 years, and a mean follow-up of 23.64±8.2 months. At the last follow-up, 92% of patients achieved a clear graft. The cumulative survival probability was 0.85 (CI95% 0.52-0.96) at 36 months. More than half of cases (56.5%) achieved an ECD ≥1000 cells/mm 2. CCT reduced significantly at 6 months postoperative and remained unchanged until the last assessment, while CDVA increased significantly during the follow-up period. No significant changes were found in IOP. No intra- or post-operative complications were reported.

Conclusions

PPK with the Endo-K Pro ® implant seems to be an effective and safe surgical approach as an alternative in high-risk patients for PK, allowing a full-thickness corneal transplantation without performing an open-sky procedure.

Financial Disclosure of all authors

The Fernández-Vega Institute receives an economic contribution for research, in relation to the product EndoK.

Abstract #005

Modified Deep Anterior Lamellar Keratoplasty Technique to Rescue a Failed Penetrating Keratoplasty

B. Alfonso-Bartolozzi*[a], C. Lisa Fernández[a], L. Fernandez-Vega Cueto[a], JF. Alfonso Sanchez[a]

[a] *IOFV, Oviedo, SPAIN*

** Presenting author (alfonso.bartolozzi.b@gmail.com)*

Purpose

To describe a modified deep anterior lamellar keratoplasty (DALK) technique to rescue failed penetrating keratoplasty (PK) grafts

Setting

Introduction
Case description
Results and discussion
Conclusions

Report of case

This is a patient who underwent a PK in the left eye more than 30 years ago. Then was treated with intracorneal ring segments (ICRS) for the correction of astigmatism secondary to a ectasia recurrence (2012). The refractive astigmatism after ICRS improved from -9.00 to -3.50 D, remaining stable for 8 years.
Ten years later, it was decided to perform a new surgical intervention. The PK was small, centered on the pupil, with ectatic progression in the scar. Due to that, we decided to perform a DALK. In these cases, the trepanation is performed outside the previous scar, centered on the corneal limbus and the pupil. Then, we continue with the pre-descemetic manual dissection described by Anwar in 1974, starting from the edge of the trepanation, the goal is to reach a pre-descemetic plane between 50 and 70 microns in the central part of the cornea, measured with intraoperative OCT or ultrasonic pachymetry, and then continue the dissection towards the periphery. Dissection movements in the deep planes must be careful, to avoid tractions at the level of the scar. Once the appropriate plane is reached at a central level, we must go beyond the scar from the PK to reach the edge of the new trephination, preventing the scar from opening and causing a perforation. Once the appropriate plane has been obtained, the donor cornea is prepared and it is sutured.

Conclusion/Take home message

This DALK technique in patients with previous PK, when the endothelium is viable, is a possible procedure, and could avoid having to perform another penetrating keratoplasty.

Abstract #006

A New Pre-descemetic Corneal Ring (Neoring) in Deep Anterior Lamellar Keratoplasty for Moderate-Advanced Keratoconus: 5-Year Long-Term Follow-Up

B. Alfonso-Bartolozzi*[a], JF. Alfonso Sanchez[a], L. Fernandez-Vega Cueto[a], C. Lisa Fernandez[a]

[a] *IOFV, Oviedo, SPAIN*

** Presenting author (alfonso.bartolozzi.b@gmail.com)*

Purpose

To assess the outcomes of implanting a new polymethylmethacrylate (PMMA) ring (Neoring; AJL Ophthalmic) in pre-descemet deep anterior lamellar keratoplasty (PD-DALK) procedure for moderate-advanced keratoconus

Setting

Prospective study

Methods

This prospective study included 40 eyes of 40 patients with moderate-advanced keratoconus who underwent PD-DALK with Neoring implantation. Neoring was implanted in a pre-descemetic pocket. The post-operative examination included refraction, corrected distance visual acuity (CDVA), corneal tomography, and endothelial cell density (ECD). The root mean squares (RMSs) for coma-like aberrations and spherical aberration were evaluated for a pupil size of 4.5 mm. The junctional graft (Tg) and host (Th) thicknesses were measured. The post-operative follow-up was 24 months.

Results

Post-operative CDVA was 0.77 ± 0.18 (decimal scale), 100% of the eyes achieved a CDVA of 0.7 (decimal scale). The refractive cylinder was -3.05 ± 2.41 5-years after surgery. No eyes had a post-operative refractive cylinder ≥5.00 D. At the last visit, the mean keratometry was 45.12 ± 2.14 D. The mean ECD remains without changes over the follow-up (P = 0.07).

Conclusions

The results of this study suggest that PD-DALK along Neoring implantation is a viable, effective, and safe option to optimize the post-operative results for moderate-severe keratoconus.

Financial Disclosure of all authors

Nothing to disclose

Abstract #007

Intrastromal Corneal Ring Segments Implantation After Deep Anterior Lamellar Keratoplasty for Astigmatism Correction: Mid-term and Long-term Follow-up

B. Alfonso-Bartolozzi*[a], L. Fernandez-Vega Cueto[a], C. Lisa Fernández[a], JF. Alfonso Sanchez[a]

[a] *IOFV, Oviedo, SPAIN*

** Presenting author (alfonso.bartolozzi.b@gmail.com)*

Purpose

The aim of this study was to assess the long-term outcomes of implanting intrastromal corneal ring segments (ICRSs) using a femtosecond laser for correcting astigmatism in patients who had previous deep anterior lamellar keratoplasty (DALK) throughout a 5-year follow-up period.

Setting

Retrospective study.

Methods

This retrospective study included 40 eyes of 40 patients with previous DALK and astigmatism ≥3.00 D who underwent Ferrara-type ICRS implantation. The manifest refraction, uncorrected (UDVA) and corrected (CDVA) distance visual acuity (logMAR), and corneal topography were recorded preoperatively and at 6, 12, 36, and 60 months postoperatively.

Results

The mean UDVA (logMAR scale) improved to 0.71 ± 0.37 at 6 months postoperatively. The mean CDVA (logMAR) significantly improved from 0.36 ± 0.17 to 0.22 ± 0.12 at 6 months after surgery. Both UDVA and CDVA remained unchanged throughout the follow-up. Postoperatively, no eyes lost lines of CDVA, and around 80% of the eyes gained lines of CDVA. The safety index was 1.4. The refractive cylinder decreased from -6.86 ± 2.62 D to -2.33 ± 1.09D at 6 months postoperatively, and subsequently, it was stable over the postoperative period. The maximum and minimum keratometry measurements significantly decreased after surgery.

Conclusions

This study shows the long-term viability of Ferrara-type ICRS implantation using a femtosecond laser as a surgical alternative for astigmatism correction in post-DALK eyes.

Financial Disclosure of all authors

Nothing to disclose

Abstract #008

Success rate of primary cultures of corneal endothelial cells from donors over 55 years old

I. Aouimeur*[a], Z. He[a], C. Perrache[a], T. Sagnial[a], JY. Thuret[b], G. Thuret[a], P. Gain[a]

[a] *UNIVERSITY JEAN MONNET, Saint-Etienne, FRANCE ;* [b] *CEA Saclay, Gif-Sur-Yvette, FRANCE*

** Presenting author (ines-aouimeur@gmx.fr)*

Purpose

Due to the global shortage of donors, alternatives to corneal donation are being developed. Cell injection therapy and tissue-engineered endothelial keratoplasty are the most realistic but require mass production of corneal endothelial cells (CECs). This constitutes a major challenge especially if corneas from "regular" donors (aged 70 on average in Europe) are used. It should be remembered that the first clinical successes reported by Kinoshita et al. used corneas from donors under the age of 29, which are by definition very rare. Aim: to investigate the success rate and specific challenges of primary cultures of CECs from old donors.

Setting

Statistical analysis on the primary culture of CECs performed at the “Biology, engineering and imaging for Ophthalmology laboratory” (BiiO, University of Saint-Étienne, France.)

Methods

Analysis was conducted on 233 individual culture wells obtained from 44 organ-cultured (OC) corneas. The average age was 71±14 (55, 93) years, with a postmortem (PM) duration of 15±7 (1, 25) hours, initial endothelial cell density (ECD) of 2273+/- 465 (1287, 3167) cell/mm^2, and OC time of 27+/-14 (4, 56) days. The cell cultures were classified based on cell morphology and ECD into failure and success. In the failure category, two subgroups were identified: endothelial-mesenchymal transition (EndMT) and senescence with low ECD. Successful culture required meeting three conditions: analysis from at least 3rd culture passage, absence of EndMT, and ECD>2000.

Results

Successful cell features were found in 33 culture wells (14.3%) originating from 13 different corneas. The average age was 72±14 (55, 86) years, with a postmortem duration of 14±8 (1, 23) hours, initial ECD of 2323+/-460 (1287, 2874) cells/mm^2, and OC time of 28+/-19 (4, 56) days. No significant difference in these corneas' characteristics was found between successful and failed cultures. 58,4% of cultures exhibited senescent features, 19.9% displayed EndMT, and 7.4% presented both failure features. CECs in different culture wells from the same cornea might exhibit either successful or failure features.

Conclusions

Primary culture of CECs for clinical use is achievable but with a success rate of only 14.3% when utilizing corneas from donors of 55 years old and more. Surprisingly, we did not identify any correlations between culture success and corneal characteristics, including age, ECD, and duration of OC. This implies the existence of random parameters that are not yet well understood, likely associated with the culture method. Optimizing the culture method is crucial for enhancing the success rate and envisage industrial transfer.

Financial Disclosure of all authors

None

Abstract #009

Ocular surface reconstruction after burn injury by simple conjunctival and simple limbal epithelial transplantation

E. Bonacci*[a]

[a] *EYE CLINIC OF THE UNIVERSITY OF VERONA,, Verona, ITALY*

** Presenting author (erika.bonacci@univr.it)*

Purpose

To restore ocular surface in patients with symblepharon, fornix reduction, bulbar block, and limbal stem cell deficiency (LSCD) following chemical eye injury.

Setting

Eye Clinic of Verona.
Study design Single center case series.

Report of case

We performed symblepharon lysis and resected conjunctival scar tissue followed by two-stage treatment: simple conjunctival epithelial transplantation (SCET),
to restore conjunctival epithelium upon the symblepharon site and subsequent simple limbal epithelial transplantation (SLET) to recover limbal function and healthy cornealsurface. Best corrected visual acuity (BCVA), slit lamp examination, Wong-Baker FACES Pain Rating Scale (WBFPS) and in vivo confocal microscopy (IVCM) were assessed at baseline, 1 and 3 months after SCET and SLET, and 6, 12, and 36 months after SLET.
Two patients were enrolled. Eye motility and fornix depth were promptly restored after SCET, and conjunctival epithelium with goblet cells was observed at 3
months. Corneal epithelium and cornea-conjunctiva transition zone were observed at 6 months after SLET. The WBFPS grade changed from 6 and 4 at baseline in Case 1 and Case 2, respectively, to 0 six months after SLET. The BCVA improved from hand motion and 1.0 LogMAR before surgery in Case 1 and Case 2, respectively, to 0.5 LogMAR six months after SLET. Results were maintained up to 3-year follow-up. Conclusion Two-stage treatment, SCET and SLET, represents a feasible strategy to effectively manage ocular surface disorders after burns and it provides long-term restoration of both conjunctival and corneal epithelium, improving both subjective
symptoms and visual acuity.

Conclusion/Take home message

for the first time this study showed the results of a two-stage surgery combining SCET and SLET in the management of ocular surface disorders after burns. Also, it points out SCET efficacy as key for the long-term success of SLET, which is the actual goal of the surgery in the perspective of visual acuity rehabilitation in eyes with injured ocular surface.

Abstract #010

Ethanol preserved cornea donors as long-term storage for acute tectonic keratoplasties

P. Bonatti*[a], C. Palme[a], A. Franchi[a], N. Franz[a], B. Steger[a], V. Stoeckl[a], B. Kremser[a]

[a] *Department of Ophthalmology, Medical University of Innsbruck, Austria, Innsbruck, AUSTRIA*

** Presenting author (paolo.bonatti@student.i-med.ac.at)*

Purpose

Acute corneal perforation is a sight-threatening ocular emergency requiring immediate surgical closure. Globe restitution for defects too large for gluing or amniotic membrane transplantation require tectonic keratoplasty to provide sufficient biological tissue replacement. There is a global shortage of corneal tissue especially for emergency procedures. Ethanol preserved corneal tissue is devitalized, immunologically neutral, chemically crosslinked, and suitable for long-term preservation. This study examines the long-term outcome of ethanol stored corneoscleral tissue as a readily available corneal grafts for emergency tectonic keratoplasty.

Setting

The study was conducted as a monocentric, retrospective chart review at the Department of Ophthalmology of the Medical University of Innsbruck (MUI), Austria.

Methods

All consecutive patients who underwent tectonic keratoplasty for corneal perforation between January 2018 and December 2022 were included reviewed. The MUI eye bank provides corneoscleral tissue unsuitable for keratoplasty due to low endothelial cell counts, stored in 95% ethanol. Prior to the procedure, it is thoroughly rinsed for 20 minutes and prepared by the surgeon to match the size of the defect. Demographic data and the underlying disease, as well as surgical data including information on graft size and specifics of the surgical technique were collected. The postoperative analysis focused on the durability of the graft (Intact Globe Restitution Interval).

Results

21 emergencies tectonic procedures of 16 patients (6 female, 10 male) were included. Mean age was 79.5+/-12.3 years. The underlying ocular diseases were neurotrophic (38%), peripheral ulcerative (38%), metaherpetic (19%) and other infectious (5%) ulcers. The mean graft diameter was 4.2+/-1.2 mm (range 3-7mm). Mean intact globe restitution interval was 16.3 +/-14.6 months. Epithelial closure was observed after an average of 22.4+/-24 days. 12 cases did not need any further surgery whereas 9 cases received re-surgery for either visual rehabilitation (n=2), enucleation (n=1) or re-perforation (n=6, 29%) due to uncontrollable systemic disease. Final visual acuity was l.6+/-0.8 logmar.

Conclusions

Ethanol stored donor corneal tissue is a feasible alternative to organ culture preserved tissue for emergency tectonic keratoplasty to close corneal perforations. Its use provided long term globe restitution and allowed subsequent elective penetrating keratoplasty for visual rehabilitation.

Financial Disclosure of all authors

There are no financial conflicts of interest to disclose.

Abstract #011

New deep learning-based algorithm to assess quality of primary corneal endothelial cell cultures

G. Bonnet[a], Y. Gavet[b], L. Parveau[a], H. Zhiguo[a], P. Gain[a], G. Thuret[a], C. Maurin*[a]

[a] *BiiO Laboratory, Jean Monnet University, Saint-Priest En Jarez, FRANCE ;* [b] *SPIN Center, School of Mines, Saint-Etienne, FRANCE*

** Presenting author (corantin.maurin@univ-st-etienne.fr)*

Purpose

The development of corneal endothelial cell therapy as an alternative to donor corneal transplantation requires mass cultivation of endothelial cells and determination of their quality. Endothelial cell density and cell morphology are recognized quality criteria, among others. However, these parameters are difficult to measure on confluent cells using conventional image analysis tools. Aim: to develop an automatic method of cell segmentation by AI allowing accurate ECD and cell morphology measurement.

Setting

Basic experiments conducted at the Biology, Engineering and imaging laboratory (BiiO, SaintEtienne University), on in vitro primary cultures of human Corneal Endothelial Cells (hCECs), after immunofluorescent labelling with NCAM (CD56) which reveals lateral cell membranes, thus highlighting cell contours. Images acquired with the x10 objective were used.

Methods

We used the pix2pix model available on GitHub with the aim of segmenting cell membranes exhaustively. We constituted a training and testing group of images (2048 x2048 pixels, for a microscopic field of 1331x1331 µm) in which all cell membranes of variable pixel width were labelled manually using photoshop by biologists as references, paired with inputs. AI predictions were then skeletonized after taking the convex hull of each cell. Mean cell number and morphology parameters were then measured using standard image analyze methods on Python. Reference and AI-generated images were compared using the dissimilarity criterion (Gavet et al. 2012, JMIV).

Results

Manual labelling of images took on average 10 hours per image. The first AI training was done with 256x256 pixels thumbnails from training images. Image analysis by the AI took on average 5 minutes on conventional computer (CPU i7-11850-2.50 GHz and CPU NVIDIA GTX A4000).

On the dissimilarity criterion, after testing our model on new images, we obtained an average value of 0.0667 (0 meaning a perfect prediction within the chosen tolerance, and ≥1 in the case of a poor prediction). Mean cells number was 1947 on the references, while AI had an average error of 131.

Conclusions

The development of an AI algorithm to trace the contours of hCEC in culture is imperative to obtain a reliable measure of their quality during bioengineering processes. It could allow to rapidly analyze batches of cells. Accuracy could be improved by expanding the learning database.

Financial Disclosure of all authors

There is no financial disclosure for this abstract

Abstract #012

VIsual changes after Descemet's Membrane Endothelial Keratoplasty (DMEK): 1 year of follow up

R. Bouchikh El Jarroudi*[a], J. Widmer Pintos[b], M. Calatayud Riera[a], C. Arnaldos López[b], M. Carbonell Puig[a], A. Arango Rodríguez[a], A. Sabala Llopart[a]

[a] *Hospital Universitari Germans Trias i Pujol, Badalona, SPAIN ;* [b] *Hospital General de Granollers, Granollers, SPAIN*

** Presenting author (rachid.bascara@gmail.com)*

Purpose

To evaluate functional outcomes after DMEK surgery at our centre.

Setting

The present study is a retrospective case series that includes 41 eyes of 36 patients who underwent DMEK with between January 1, 2020 and January 1, 2023 in *Hospital Universitari Germans Trias i Pujol* (Badalona, Spain).

Methods

Epidemiological and clinical variables of operated patients have been analysed from clinical records baseline and during the conventional post-surgery follow up (a month, 3 months, 6 months, and a year after intervention).

Epidemiologic data include gender (female, male), affected eye (right, left), diagnosis for which DMEK was indicated and patient age at the surgery.

Clinical variables included Best Corrected Visual Acuity (BCVA) according to Early Treatment Diabetic Retinopathy Study charts (ETDRS) protocol, sphere, cylinder, cylinder axis and complications during the postoperative period (redubbing, graft failure, rejection) of each visit.

Results

Mean age at the moment of surgery: 68.9 ± 10.6 years.

Etiology: 53% Fuchs, 15% orneal descompensation, 2.5% graft descompensation and 2.5% endothelial deposits disease

Graft survival measured 90.2% at 1 year.

Rebbubling Rate 4.9%.

Te next results will be represented baseline, a month, 3 month, 6 month and 1 year after surgery.

BSCVA (ETDRS protocol) was 55.6, 69.2, 77.0, 73.3 and 71.3 ($p < 0.05$).

Sphere was 0.9, 0.8,1.17, 1.08 and 1.08 in each follow up($p > 0.05$)

Cylinder was -1.34, -1.8, -1.24, -1.47 and -1.32

Axis was 67.6, 65.2, 69.9, 80.7 and 87.2

Conclusions

DMEK is an effective technique for patients with endothelial dysfunction, presenting an anatomical improvement (decrease in corneal thickness) and functional improvement (improvement in visual acuity) and with a low rate of graft failure after one year.

Financial Disclosure of all authors

No conflict of interest related with the suty (self funded)

Abstract #013

Bullous dystrophy on anterior chamber IOL.

Y. Bouhafra*[a], B. Bousellam[a], HA. Eddaoui[a], Y. Bennani[a], N. Benchekroun[a], M. Benharbit[a], M. Belmekki[a]

[a] *CHEIKH ZAID HOSPITAL, Rabat, MOROCCO*

** Presenting author (y.bouhafra@gmail.com)*

Purpose

Implanting an intraocular lens (IOL) in the anterior chamber, though rare, can lead to serious complications, including bullous dystrophy. This condition, characterized by dysfunction of the corneal endothelial cells, can lead to a progressive loss of visual clarity.

Therefore, explantation and reimplantation of the IOL, coupled with Descemet Membrane Endothelial Keratoplasty (DMEK) corneal graft surgery, represent a significant advancement in the field of ophthalmic surgery.

Setting

We report the case of a 45-year-old patient who presents a decrease visual acuity in his right eye following the development of post-traumatic cataract, which was operated on in 2019 with the placement of an anterior chamber intraocular lens (IOL).

Report of case

We report the case of a 45-year-old patient who presents a decrease visual acuity in his right eye following the development of post-traumatic cataract, which was operated on in 2019 with the placement of an anterior chamber intraocular lens (IOL). The clinical examination reveals corrected visual acuity of 1/20 in the right eye and 10/10 in the left eye, with intraocular pressure (IOP) measured at 8 mmHg (hard globe on palpation) in the right eye and 14 mmHg in the left one.

Using slit-lamp examination, we observe an opacified anterior chamber intraocular lens (IOL), endothelial dystrophy with epithelial haze, significant corneal thickening, diffuse corneal edema, conjunctival hyperemia, and a sluggish photo-motor Reflex in the right eye. the left eye was unremarkable.

Optical Coherence Tomography (OCT) reveals corneal thickening with a minimum pachymetry of 713 μm and 572 μm in the right and left eyes, respectively. Specular microscopy uncovers endothelial dystrophy in the right eye, and the ocular ultrasound shows a flat retina with intravitreal echoes in both eyes.

Our patient underwent explantation of the anterior chamber intraocular lens (IOL) followed by reimplantation with an artisan IOL combined with Descemet Membrane Endothelial Keratoplasty (DMEK), with no postoperative complications.

Conclusion/Take home message

Bullous dystrophy is a painful and debilitating corneal condition that can result from a variety of causes, including anterior ocular surgeries such as corneal grafting or intraocular lens implantation, especially in the anterior chamber, the case of our patient. One of the most promising surgical advancements of treating this condition is the explantation and reimplantation of the intraocular lens, combined with corneal grafting.

This Endothelial decompensation resulting from the implantation of an intraocular lens (IOL) in the anterior chamber is a serious complication that can lead to a deterioration of patient's quality life. Fortunately, due to advancements in corneal surgery, The DMEK provides a reliable solution to restore visual clarity and improve the vision of affected patients.

Abstract #014

Outcomes of penetrating keratoplasty in corneal melt : a case series.

M. Boutkhil*[a], M. Boutkhil[a], M. Belmekki[a]

[a] *CHEIKH ZAID HOSPITAL UNIVERSITY, Rabat, MOROCCO*

** Presenting author (bmarwaa4@gmail.com)*

Purpose

Corneal melting is a severe complication of advanced corneal disease associated with an imminent risk of perforation. Infectious, immunological and iatrogenic causes have been reported to cause this condition. Once this complication occurs, the range of therapy options becomes severely limited, leaving the patients with an unfavorable prognosis in the future. This case series describes the outcomes of penetrating keratoplasty performed in six eyes with subtotal and total corneal melting. Through this case series,we hope to highlight the importance of early consideration of surgical options for patients unresponsive to therapy.

Setting

The keratoplasties were conducted in the Eye center of the International University Hospital Cheikh Zaid, Rabat, Morocco, and performed by the same experienced surgeon. The donor's grafts were obtained by an FDA approved eye bank located in the United States.

Methods

This study presents six cases of corneal melting, attributed to infections following corneal foreign bodies and intracorneal ring implants, Mooren's ulcer, and necrotizing keratitis post-crosslinking. Prior to the surgery, eyes with an infectious origin received antibiotics, antivirals, and/or antimycotics tailored to identified pathogens. Manual removal of necrotic tissue and donor graft transplantation were conducted, with graft diameters 0.25mm larger than the recipient's trephined segment, ranging from 7.75 mm to 9 mm. Post-operative treatment for infectious eyes included pathogen-specific antimicrobial agents and local corticotherapy.

Results

The patients' age ranged from 10 to 76 years, with a male-to-female ratio of 4:2. Herpes viruses and mycotic pathogens were incriminated in the infectious cases. Three eyes developed perforation following corneal melting. Post-operatively, endothelial graft rejection was reported in one eye, occurring one year post-surgery. Anatomical restoration was achieved in four eyes (66%), and two eyes developed phthisis bulbi (33%). In infectious cases where anatomical restoration was achieved, the pathogen was successfully eradicated. However, optical results were limited, ranging from no light perception in two eyes , counting fingers in one eye and 1/20 in one eye.

Conclusions

In our case series, while anatomical and therapeutic outcomes were partially attained , the visual outcomes were severely limited . This report emphasizes the poor prognosis of a delayed keratoplasty at advanced stages of corneal disease, especially in the presence of corneal melting with or without perforation. Non-response to medical treatment should serve as an alert for potential upcoming complications prompting timely intervention.

Financial Disclosure of all authors

No financial disclosure

Abstract #015

Ophthalmological complication of an intra palpebral injection of hyaluronic acid

R. Chudzinski*[a], M. Kern[a], N. Bouzid[a], C. Gullon[a], C. Burillon[a]

[a] *Hôpital Edouard Herriot - Hospices civils de Lyon, Lyon, FRANCE*

** Presenting author (roman.chudzinski@gmail.com)*

Purpose

To describe and illustrate the course and management of an iatrogenic intracorneal and intraocular injection of hyaluronic acid.

Setting

Hospital Edouard Herriot university hospital, ophthalmology department, Lyon, France.

Report of case

We report the case of a 75-year-old patient suffering from severe left facial paralysis following a parotidectomy with sacrifice of the facial nerve. To limit lagophthalmos, a hyaluronic acid injectable gel combined with 2% lidocaine was injected into the upper left eyelid in the maxillofacial surgery department. The gel used was in the form of a 1mL syringe containing 15mg of hyaluronic acid and 3mg of lidocaine hydrochloride in a phosphate solution with a pH of 7.2. The procedure was carried out in the usual way, with no instillation of anaesthetic eye drops and no abnormal pain during the procedure reported by the patient or the injecting practitioner. In the hours following the injection, the patient experienced a drop in visual acuity. At the follow-up call the day after the procedure, there was no pain, skin necrosis or other abnormalities. Patient were addressed to our department for decrease in visual acuity 2 weeks after the injection. An OCT examination of SA was then carried out, which revealed well-limited, optically empty intra-stromal spaces, an effraction of the Descemet and an intra-corneal pathway. The diagnosis of iatrogenic intracameral and intracorneal injection of hyaluronic acid was supposed and the patient has been treated with Vitamin A ointment, ocular lubricant and regularly seen for follow up. At the 4 weeks check-up, the clinical examination was stable, but a major hypertonia of 37mmHg was discovered. A local hypotonic maximal therapy was started, combined with acetazolamide PO. The hypertonia was rapidly brought under control with the continuation of dual therapy for several months. No further problems with uncontrolled hypertonia were seen in the follow-up, but visual recovery will require transfixing keratoplasty to correct persistent central corneal opacity.

Conclusion/Take home message

This case highlights a potentially severe complication of intrapalpebral hyaluronic acid injections that can lead to corneal blindness and require transfixing keratoplasty. In addition, the combined injection of hyaluronic acid and lidocaine resulted in transient hypertonia at 4 weeks, underlining the importance of careful monitoring to detect and treat this late complications.

Abstract #016

TRENDS IN CORNEAL TRANSPLANTATION IN A TERTIARY HOSPITAL - A PARADIGM CHANGE

I. Coelho-Costa*[a], M. Ribeiro[a], G. Godinho[b], R. Teixeira-Martins[a], L. Torrão[a], R. Moreira[a], J. Pinheiro-Costa[a]

[a] *Centro Hospitalar Universitário de São João, Porto, PORTUGAL ;* [b] *Centro Hospitalar de Leiria, Leiria, PORTUGAL*

** Presenting author (minesccosta@gmail.com)*

Purpose

Keratoplasty is the most frequently performed transplant surgery worldwide. Over the past decade, penetrating keratoplasty (PK) has been surpassed by lamellar procedures (LK) in several developed countries, owing to their less invasive nature, lower risk of rejection, and superior functional outcomes. This study aimed to detail the types of corneal transplantation performed at our centre from 2011 to 2021 and to assess the trends of different techniques whilst also evaluating the impact of the COVID-19 pandemic on surgery profiles.

Setting

Ophthalmology Department of São João University Hospital Center (CHUSJ)

Methods

Retrospective analysis of all patients undergoing corneal transplantation at the University Hospital Center of São João (CHUSJ) between January 2011 and December 2021. Demographic variables, surgical indication, and type of transplantation performed were collected and analyzed. 1392 eyes were included in the final sample.

Results

In 2011, 99.3% of transplants performed were PK and all endothelial pathology (EP) was treated this way. LK increased, particularly after 2015, predominantly due to posterior lamellae transplantation due to EP. By 2016, LK surpassed PK in treating EP (37.8% of procedures being DSAEK; 21.6% being DMEK). In 2021, 52.6% of EPs were treated with DSAEK and 26.3% with DMEK. The year 2020 hindered corneal transplantation procedures performed to the lowest value in the last decade, due to the COVID-19 pandemic. In 2021, there was a 58% increase in the number of transplants compared to the previous year.

Conclusions

Over the last decade, there has been a shift in the number of LK procedures at CHUSJ, surpassing PK from 2016 onwards, particularly for the treatment of endothelial pathologies with posterior lamellar techniques. This represents a paradigm shift at CHUSJ, mirroring practice tendencies in other centres.

Financial Disclosure of all authors

The authors have no financial disclosures

Abstract #017

New generation of corneal bioreactors for fundamental and translational research.

E. Crouzet*[a], S. Urbaniak[a], JM. Papillon[a], L. Coulomb[a], C. Perrache[a], P. Gain[a], G. Thuret[a]

[a] *UNIVERSITY JEAN MONNET, Saint-Priest En Jarez, FRANCE*

** Presenting author (e.crouzet@univ-st-etienne.fr)*

Purpose

The corneal bioreactor concept is based on recreating as physiological an environment as possible. The cornea and its scleral rim are used to separate an endothelial and epithelial chamber and restore the equivalent of intraocular pressure (IOP), while circulating the nutrient media on both sides of the cornea. A first simple version (BRv1) enabled us to demonstrate that this "active storage machine" improved endothelial survival, corneal thickness control and epithelial regeneration compared with passive storage in the same organoculture medium. Aim: to present a series of technical improvements that optimize BRv2 operation and increase experimentation possibilities.

Setting

Fundamental research conducted in our university laboratory Biology, engineering and imaging for Ophthalmology (BiiO, St-Etienne), using human corneas not suitable for transplantation.

Methods

The BRv1 utilized off the shelf components: peristaltic pump with an Edwards' blood pressure sensor, a micro solenoid valve, a microcontroller. Each BRv1 was controlled by a HMI (Human Machine Interface). For the BRv2, we redesigned most of mechanical components as well as the electronic control and signal processing. An application replaced the initial HMI. We also designed new peripheral tools: medium flow measurement by weighing, optical pH sensor, trans-epithelial resistance, corneal apparent permeability measurement, new lid with with a flexible membrane in place of one of the glass windows.

Results

In the BRv2, the endothelial pressure was controlled with a 0.1mmHg standard deviation. The flow rate measured in real time correlated perfectly with the given setting (r=0.99). The BRv2's application allowed configuring and monitoring several bioreactors at the same time, displaying pressure and flow rate curves in real-time. pH was measurable within biologically relevant ranges (6.5 to 8.0) with a precision of 0.22% or +/- 0.08. Trans-epithelial resistance, and corneal apparent permeability measurement allowed performing pharmakinetic studies (see M. Mentek's poster). The new lid allowed performing contact measurements.

Conclusions

BRv2 enhances IOP and nutrient media flow control (accuracy, traceability). Additionally, the new peripheral tools make it more versatile, facilitating experimental study design according to specific needs. This expands the scope of corneal bioreactors studies (see L. Coulomb's freepaper and P. Goin's poster), offering greater research possibilities, directly on human corneas.

Financial Disclosure of all authors

P. Gain and G. Thuret patented the BR

Abstract #018

Synthetic Corneal Endothelial Substitutes: Results of Phase-2 Safety Evaluation Study

LR. Daniel Raj Ponniah*[a]

[a] *DR AGARWALS EYE HOSPITALS, TIRUNELVELI, S.INDIA, Tiurnelveli,, INDIA*

** Presenting author (drlionalraj@gmail.com)*

Purpose

To evaluate the safety and effectiveness of implanting a novel synthetic corneal endothelial substitute (endothelial keratoprosthesis) in cases with chronic endothelial dysfunction.

Setting

A phase-2 prospective open-label clinical safety & efficacy evaluation at the Cornea department in a tertiary eye care centre.

Methods

A phase-2 prospective open-label clinical safety & efficacy evaluation. Endothelial dysfunction following pseudophakic corneal edema not associated with systemic diseases like Herpes Simplex or prior corneal surgeries was subjected to a central 6.5 mm synthetic endothelial implantable substitute after a central 7.0mm descemetorhexis & attached with C3F8 gas (85% fill in the AC). Pre & post-operative central pachymetry (in mic.), vision (in ETDRS characters), and pain analog (1-100) were analyzed in addition to re-bubbling rates & toxic reactions due to implants.

Results

14 cases enrolled. Longest follow-up is 21-months, lowest 14-months. Baseline vision was 10.54+/-2.2 ETDRS characters, which improved to 41.75+/-8.7 by M-1 & 60.72+/-13.1 by M-12. Central pachymetry reduced from 720 mic, to 552 by M-1 & maintained at 491 by M-12. Presenting pain was 91.9+/-2.3 & 7.7+/-2.5 at M-12 (p=0.0001). No immunologic, adverse reactions noticed. None explanted. 4 needed re-bubbling (D7, D7, D12 & 21,D7,D14&M3). Subject-2 died after M-6, postmortem HPE revealed epithelialization & fibrosis along implant edges favoring long-term device retention.

Conclusions

Endothelial keratoprosthesis improved vision, reduced edema caused in endothelial dysfunction & was not associated with toxicities until month 12, & are continuously been monitored. It could be an alternative to EK with no risks of rejection events or graft failures, and could change the practice pattern of "Transplant to Implant Science"

Financial Disclosure of all authors

The authors have no financial interests to disclose.

Abstract #019

Observations from a retrieved corneal specimen with endothelial keratoprosthesis; The first human post-mortem case report

LR. Daniel Raj Ponniah*[a]

[a] *DR AGARWALS EYE HOSPITALS, TIRUNELVELI, S.INDIA, Tiurnelveli,, INDIA*

** Presenting author (drlionalraj@gmail.com)*

Purpose

To report the morphologic and histopathologic changes observed seven months after corneal endothelial synthetic substitute in a case of chronic endothelial dysfunction, the first human cadaveric corneal sample analysis.

Setting

A case report from a postmortem corneal sample retrieved seven months post endothelial keratoprosthesis.

Report of case

A 68 YO female, a participant of first in human Phase-2 clinical safety evaluation of corneal endothelial prosthesis expired seven months post-surgery due to cardio-respiratory illness. The corneoscleral button was excised with due consent from her family and was analyzed under a microscope for the morphology & integrity of the implant in addition to histopathological examination after making paraffin blocks.

Results: The Endothelial device was well adherent to the underlying corneal stroma and was inseparable easily. Microscopically, the tissues were embedded completely showing the sclera, cornea, and the synthetic device adhered to the cornea. There was focal epithelialization of the artificial implant with fibrosis along the edges of the implant. This is the first postmortem case report following such implantations.

Conclusion/Take home message

There was epithelialization and fibrosis along the edges of the synthetic endothelial substitute, which could be the very reason for good retention of the device with the cornea, and absent device detachment rates, months after endothelial keratoprosthesis.

Abstract #020

EndoArt Implantation in Patients at High Risk for Human Graft Rejection

O. Daphna*[a]

[a] *EYE YON MEDICAL, Bet Elazary, ISRAEL*

** Presenting author (odaphna@gmail.com)*

Purpose

Purpose: To report six months safety and efficacy outcomes of implantation of an impermeable artificial lamella (EndoArt®) on the posterior surface of the cornea of adult patients suffering from chronic corneal edema who were at high risk for human graft rejection.

Setting

The EndoArt® (EyeYon Medical, Ness Ziona, Israel) was implanted in 27 high- risk patients.

Report of case

Methods: The EndoArt® was implanted in 27 high- risk patients. These patients either failed multiple keratoplasties or had a condition placing them at risk for human graft failure. Thirteen of the 27 were operated as part of a clinical trial, 8 were compassionate cases and additional 6 patients were implanted with EndoArt® following CE approval. Safety and efficacy data, including central corneal thickness (CCT), best corrected visual acuity (BCVA) and pain score (measured by visual analogue scale, VAS) are presented for the first 6 months post implantation.

Results: Significant improvements were observed. Mean CCT decreased from 793±231μm (n=27) to 593±173 μm at 6-month follow-up (n=22, p-value<0.05). Pain (VAS score), was markedly reduced from 18±18 pre-op (n=18) to 1±3 at 6 months post implantation (n=17, p-value<0.05). Despite 38% of the patients having low visual potential, BCVA improved in 58.3% in more than 1 line of ETDRS, at 6-month follow-up. There were no long-term complications, nor reports of infections or inflammation related to EndoArt® implantation. The implants remained transparent throughout the follow up. One device was removed at 3- months follow-up due to insufficient attachment to the cornea and was replaced by DSAEK.

Conclusion/Take home message

Conclusions: The EndoArt® implant was found to be a safe and effective treatment for chronic corneal edema in patients at high risk for human graft rejection, reducing edema and pain, and improving vision in most patients. EndoArt®, as a synthetic implant, is not subjected to rejection, and may provide a long- term solution for high-risk patients.

Abstract #021

Role of Tenonplasty in decreasing corneal transplant in acute ocular chemical injury - case series

AG. Dastidar*[a]

[a] *SYNERGY EYE CARE, New Delhi, INDIA*

** Presenting author (dr.aditighosh@gmail.com)*

Purpose

This study describes importance and outcome of tenonplasty in globe survival and decrease in corneal transplant in acute chemical injury

Setting

Retrospective case study conducted at tertiary care center in all patients with chemical injury between the period of 2 years.

Methods

Chemical injuries were segregated according to time of presentation, less than and more than 1 week respectively and graded from I to IV (Dua's classification).

Out of 18 eyes presenting within a week of injury ; 16 eyes without limbal stem cell deficiency (LSCD) underwent medical management. Overall 28 eyes

underwent surgical management consisting of tenonplasty ,amniotic membranew transplant , Simple limbal epithelial translant and tectonic penetrating keratoplasty was noted

Results

50 eyes of 36 patients were included in our study. Out of 36 patients ,22 (61.1%) patients had single eye involvement , while 14 (38.8%) patients had

bilateral involvement . Male preponderance was noted ,with only 5 (13.8%) female patients. 11 pediatric age group. In 69% of cases, causative agent was alkali , most common being lime (38.8%)In our study, four cases were lost to follow-up.22 eyes had LSCD out of which 17 eyes underwent tenonplasty.Other procedure were amniotic membrane

transplantation with simple limbal epithelial transplantation in 11 eyes and AMT alone in 9 eyes.Only two eyes required tectonic penetrating keratoplasty.

Conclusions

We emphasize the need of tenonplasty in eyes with presence of scleral ischemia as these factors have poor prognosis in anatomical and visual rehabilitation. Tenonplasty aids in early rehabilitation of globe and decreases the chances of melt and need of corneal transplant in acute conditions. Also need of public awareness regarding protective gear use and harm by freely available lime packets in India.

Financial Disclosure of all authors

Nil

Abstract #022

THE "BUB N'ROLL" TECHNIQUE: A NOVEL APPROACH FOR SEPARATION OF DESCEMET-ENDOTHELIUM IN DMEK SURGERY

L. Di Cello*[a], V. Davide[b], F. Biagini[a], CE. Traverso[b]

[a] *HOSPITAL SAN MARTINO GENOA, Genova, ITALY ;* [b] *HOSPITAL SAN MARTINO GENOA, Genoa, ITALY*

** Presenting author (luca.di.cello88@gmail.com)*

Purpose

To describe a standardized technique able to refine the separation of the Descemet-endothelium complex, which could guarantee the preparation of a tissue capable of rolling spontaneously, leading to the "Descemet-roll".

Setting

A retrospective study at San Martino Hospital Eye Clinic and Eye Bank, Genoa, Italy

Methods

The sclero-corneal tissue is put endothelium up on a silicone support disk. A 25 G needle is mounted over a 1mL syringe filled with culture medium (TISSUE-C, Alchimia®, Italy). The needle is inserted bevel-up beyond Schlemm canal inside the stroma. Perky hydration follows, until a Type 2 bubble is achieved, which is deflated at the end of this procedure, than dyed with trypan-blue 0.1% for 30 seconds. Manual trephination is then performed. Endothelial cell density is counted in three different central sectors of the roll. ECD was calculated before and after dissection, at 1, 3, 6, 12 months post-operatively.

Results

20 DMEK surgeries were performed by the same surgeon. Mean age of patients was 69,3 ± 6 years. Mean donors' age was 63,3 ± 11,8 years. Average duration of Bub n'roll technique were 318,62 ± 69,94 seconds, while average surgery duration was 46,66 ± 13,23 minutes. Rebubbling was necessaire in 5 out of 20 eyes (25%). Average ECD before dissection was 2852 ± 169 cells/mm^2, 2608 ± 158 after dissection, 1985 ± 167 at 3 months, and 1748 ± 117 at 12 months post-operatively, with an endothelial cells total mean loss of 39 ± 5%.

Conclusions

This novel technique revealed to be safe, easy to reproduce - requiring nonspecialized personnel to perform it - and without any expensive laboratory equipment.

Financial Disclosure of all authors

Authors have no financial disclosure

Abstract #023

The Relationship between Triplet Repeats in the TCF4 Gene and Progression of Fuchs Endothelial Corneal Dystrophy over One Year

O. Dorado Cortez*[a], S. Poinard[a], H. Vaitinadapoule[a], P. Gain[a], N. Koizumi[b], N. Okumura[b], G. Thuret[a]

[a] Laboratory for Biology, Engineering and Imaging for Ophthalmology, BiiO, Faculty of Medicine, Health & Innovation Campus, Jean Monnet University, Saint Etienne, FRANCE ; [b] Department of Biomedical Engineering, Faculty of Life and Medical Sciences, Doshisha University,, Kyoto, JAPAN

** Presenting author (oliver.dc7@gmail.com)*

Purpose

Fuchs endothelial corneal dystrophy (FECD) is by far the most common corneal endothelial disease with 4 to 10% of prevalence in the Western population affected at various stages. Among the genetic abnormalities associated with Fuchs endothelial corneal dystrophy, CTG triplet repeats in the TCF4 gene are by far the most frequent.

Setting

We conducted a prospective study with a one-year follow-up to determine whether the clinical and paraclinical course of FECD over one year is related to the extent of triplet repetition in the TCF4 gene.

Methods

One hundred and four patients (160 eyes) with FECD and the same number of age- and sex-matched control subjects without FECD were included in this study. At inclusion, the corneas were graded according to the modified Krachmer grade (KG), and the patients were genotyped for the number of trinucleotide repeats (TNRs) in the TCF4 gene. Visual acuity, Scheimpflug tomography were measured on two visits at one-year intervals. The main outcome measures were ETDRS visual acuity without and with glare, Scheimpflug tomography at baseline and after one year of natural course.

Results

The KGs ranged from 1 to 6, and 46% of the eyes were grade 1-4. The percentage of patients who harbored TNR expansion (> 40) in the TCF4 gene was 71.1% in the patients with FECD and 12.6% in the non-FECD control. Severity at inclusion was higher in the presence of TNR when considering eyes independently (mean grade ± standard deviation: 4.08 ± 1.42) without TNR and 4.66 ± 1.27 with TNR (p=.024), but it was not higher when considering patients. In one year, the ETDRS score significantly decreased by -2.8 ± 8.3.

Conclusions

It is possible to measure a clinical progression of this chronic and slow disease over a period as short as one year, but the variations are subtle. We did not find a relationship between the number of TNRs and the speed of deterioration over one year. This work should facilitate the design of future clinical trials on FECD.

Financial Disclosure of all authors

None

Abstract #024

Histopathological changes in corneas of patients with Mucopolysaccharidosis type VI that underwent penetrating keratoplasty

A. Faria Pereira*[a], S. Pedrosa[a], R. Moreira[a], J. Pinheiro-Costa[a], E. Leão-Teles[a], F. Falcão-Reis[a], A. Magalhães[a]

[a] *CHU SÃO JOÃO, Porto, PORTUGAL*

** Presenting author (acfariapereira@gmail.com)*

Purpose

Mucopolysaccharidosis (MPS) are a diseases' group caused by accumulation of undegraded glycosaminoglycans (GAGs). MPS VI is a rare autosomal recessive disease caused by N-acetylgalactosamine-4-sulfatase deficiency. Ocular manifestations are frequent, including corneal opacity, caused by accumulation of GAGs in corneal layers, inducing light scattering. In these cases, the only current treatment is corneal transplantation, usually penetrating keratoplasty (PK) or deep anterior lamellar keratoplasty (DALK). The main purpose of this study is to identify histopathological characteristics of corneas of patients with MPS VI and based on these characteristics, determine the most suitable surgical approach in corneal surgery in these cases.

Setting

Centro Hospitalar e Universitário de São João, Oporto, Portugal.

Methods

This study includes the corneas of four MPS VI patients which have been submitted to PK for corneal clouding. Specimens of primitive corneas were examined using hematoxylin/eosin, special trichrome, colloidal iron and periodic acid-Schiff stains.

Results

Studied corneas showed hyperparakeratosis of epithelium with enlarged cytoplasm, large intra and extracellular vacuoles and subepithelial deposits of mucopolissacharides, subepithelial vacuolization with Bowman disruption, presence of elongated clefts in the stroma and deposits of acid mucopolissacharides in the anterior and posterior stroma, Descemet and endothelium. However, in some specimens, continuous Descemet, without alterations and endothelium with vacuolization and fine granular deposit were also found.

Conclusions

Descemet membrane and endothelium remain unaffected until later disease stages. In such cases surgical treatment should consist of DALK. However, our study revealed the presence of deposits in all corneal layers in most cases, suggesting that older patients with more severe disease forms must be treated with PK. MPS VI is a disabling disease in which historically, palliative care was the only option. Fortunately, current therapeutic modalities, including hematopoietic stem cell transplantation and enzyme replacement therapy have increased life span and life quality in affected patients. Currently, these patients require differentiated multidisciplinary care, which includes ophthalmic surgery in specialized centers.

Financial Disclosure of all authors

The authors have no financial interests to disclose.

Abstract #025

Allogenic Simple Limbal Epithelial Transplantation (SLET) followed by Penetrating Keratoplasty (PK) in Severe Bilateral Ocular Chemical Injury

L. Fernández García*[a], P. Boned Fustel[a], M. Hurtado Sarrió[a]

[a] *Hospital Universitario y Politécnico La Fe, Valencia, SPAIN*

** Presenting author (larfergar@gmail.com)*

Purpose

To describe a clinical case of a 35-year-old male with a bilateral chemical burn caused by sodium hydroxide and to review current trends in management of severe ocular chemical burns.

Setting

The Burn Unit at Hospital Universitario y Politécnico La Fe, a third level, referral hospital in the city of Valencia (Spain)

Methods

A case study with literature search in PubMed was performed. Inclusion criteria were any relevant articles published until February 2024, with preference given to papers published in the last decade.

Results

A 35-year-old male was referred to our Burn Unit after accidental ocular contact with sodium hydroxide while working. After initial copious irrigation, his visual acuity was 20/120 and 20/400, respectively. IOP was elevated. On examination he showed a grade IV Roper Hall bilateral chemical burn with important corneal opacity and >180° limbal ischemia. A thorough debridement was performed and he received topical treatment with antibiotics, corticosteroids, insulin eye drops and autologous serum. Weeks after he received a bilateral allogenic SLET transplant and three months after that a PK was performed in the right eye with good visual outcome.

Conclusions

Chemical injuries are a frequent ophthalmic emergency, and can result in vision loss and challenging ocular surface complications. Immediate copious irrigation in acute ocular burns to remove the burning agent is mandatory and acute interventions are directed at decreasing the scope of the injury, suppressing inflammation and promoting ocular surface reepithelization. Grading of the injuries can help determining acute treatment and visual prognosis, and although patients with severe injuries are more prone to failure of treatment modalities, the recent appearance of limbal stem cell transplantation has given a positive outlook on prognosis in chronic phases of the disease.

Financial Disclosure of all authors

None to disclose

Abstract #026

PROGRESSIVE AND SEVERE PERIPHERAL ANTERIOR SYNECHIAE IN PATIENTS WITH ENDOTHELIAL KERATOPLASTY AND GLAUCOMA

E. Fernández López*[a], A. Lanzagorta Aresti[a], MJ. Roig Revert[a], M. Bautista Cortiella[a], G. Rodriguez Iranzo[a], C. Martínez Gil[a], C. Peris Martínez[a]

[a] *Fundación de Oftalmología Médica de la Comunidad Valenciana, Valencia, SPAIN*

** Presenting author (ester.fzlopez@gmail.com)*

Purpose

Iris abnormalities have been previously described after endothelial keratoplasties (EK). However, progressive peripheral anterior synechiae (PAS) formation does not seem to be a common complication of EK compared to penetrating keratoplasty. We describe six cases with previous glaucoma and EK that developed progressive and severe PAS after the transplant, compromising graft survival.

Setting

Fundación de Oftalmología Médica de la Comunidad Valenciana (FOM), Valencia (Spain)

Methods

Retrospective case series of six patients with previous glaucoma and pseudophakic bullous keratopathy that underwent EK and developed postoperative PAS. Two patients had Descemet membrane endothelial keratoplasty (DMEK) and four had Descemet Stripping Endothelial Keratoplasty (DSAEK). Five eyes had multiple glaucoma surgeries before the corneal transplant including an Ahmed drainage device. One case had a pseudoexfoliation glaucoma with no previous glaucoma surgery but required a trabeculectomy after the transplant. Despite focal and mild PAS preoperatively, severe and progressive PAS were developed during the postoperative course. Retrospective analysis of the synechiae by anterior segment optical coherence tomography (CASIA, Tomey) was performed.

Results

Mean follow-up time after the keratoplasty was 27 ± 15 months. PAS were seen before the 6 month follow-up in three cases, between 6 and 12 months follow-up in two cases and after 24 months in one case. There were no visible signs of intraocular inflammation when the synechiae developed. Despite the PAS, intraocular pressure remained stable with medical treatment. The graft failed in two of the eyes with longer follow-up. In three cases the cornea remains clear with low endothelial cell density. One case was complicated by a neurotrophic ulcer and required further surgeries.

Conclusions

Clinically, PAS is associated with chronic inflammation in the anterior chamber (elevated cytokine levels), a history of narrow angle, and a breakdown of the blood-aqueous barrier. Patients with glaucoma and drainage devices have all three, thus severe progression of the synechiae in these cases might be explained by this phenomenon. Measuring aqueous humor cytokines at the time of the transplant, a higher steroid regime and close follow up of this subset of patients might be recommended. Other possible mechanisms like peripheral Descemet's membrane tags from the Descemetorhexis or fibrine membranes would be also discussed.

Financial Disclosure of all authors

None of the authors have any financial disclosures

Abstract #027

Comparison of pseudophakic-DMEK to triple-DMEK for Fuchs' Endotelial Dystrophy

RN. Ferreira*[a], S. Duarte[a], ES. Fernandes[a], MC. Santos[a], P. José[a], AM. Quintas[a], P. Guerra[a]

[a] *Hospital de Santa Maria - North Lisbon University Hospital Centre; Universitary Clinic of Ophtalmology of the Lisbon School of Medicine, Lisbon, PORTUGAL*

** Presenting author (ruimnunesferreira@gmail.com)*

Purpose

To compare the safety and efficacy of Descemet's membrane endothelial keratoplasty (DMEK) in pseudophakic patients versus DMEK combined with phacoemulsification (triple-DMEK) for patients with Fuchs' Endothelial Dystrophy.

Setting

Endothelial keratoplasty is currently the gold standard treatment for corneal endothelial dystrophies. Cataracts are commonly diagnosed in these patients, as both conditions become more prevalent with age. The surgical approach often includes cataract surgery and keratoplasty, either sequential or combined.

Methods

Retrospective analysis of all patients with Fuchs' endothelial dystrophy who underwent primary triple or pseudophakic-DMEK, between November 2017 and March 2023, with a minimum postoperative follow-up of 6 months. The demographic and clinical characteristics of the patients were analyzed, as well as the clinical outcomes of the endothelial transplant: graft survival rate, rate of intra- and postoperative complications, best corrected visual acuity (BCVA; logMAR) and endothelial cell density (ECD). The results were analyzed at the 1st, 3rd, 6th, and 12th postoperative months and then annually.

Results

A total of 91 eyes were included (29 eyes pseudophakic-DMEK and 62 eyes triple-DMEK). Both groups had similar graft survival rates at 1 year (93% vs 89%), 2 years (91% vs 85%), and 3 years (89% vs 82%). Although pseudophakic-DMEK showed a slightly higher rate of detachments (42% vs 34%), it was not statistically significant. The two groups showed a similar rebubbling rate (24% vs 23%). Postoperative BCVA did not differ significantly between the groups after the 1st year. The average decrease in ECD was slightly higher in psedophakic-DMEK, but not statistically significant.

Conclusions

No statistically significant differences were observed between the two techniques regarding graft survival rate, rates of intra- and postoperative complications, BCVA and ECD. However, it's noteworthy that patients undergoing triple-DMEK experienced a lower number of graft detachments and a faster postoperative improvement in BCVA. Although these differences may not have reached statistical significance, they could be clinically relevant.

Financial Disclosure of all authors

The authors have no relevant financial or non-financial interests to disclose.

Abstract #028

Management of corneal perforation secondary to gonococcal keratoconjunctivitis in an adult using ethanol-stored corneoscleral donor grafts - a case report.

N. Franz*[a], L. Velez Escola[a], B. Steger[a]

[a] *Department of Ophthalmology, Medical University, Innsbruck, AUSTRIA*

** Presenting author (nadja.franz@i-med.ac.at)*

Purpose

Neisseria gonorrhoeae is a common sexually transmitted disease with potential ocular involvement from autoinfection or inoculation of infected urogenital secretion. Gonococcal keratoconjunctivitis is rare but can rapidly lead to severe vision-threatening complications such as corneal melting and perforation. Its initially similar clinical presentation to other microbial infections results in frequently delayed diagnosis and the need for combined medical and surgical intervention, remaining challenging due to graft shortage.
This case report aims to report the management of a severe case of corneal perforation secondary to isolated gonococcal keratoconjunctivitis in an adult and its medical and surgical management using ethanol-preserved corneal grafts.

Setting

The case was diagnosed and managed in November 2023 at the Department of Ophthalmology of the Medical University of Innsbruck (MUI), Austria. MUI serves as a tertiary ophthalmic referral center for western Austria.

Report of case

A 37-year-old woman was referred to MUI Department of Ophthalmology from a local ophthalmologist as an emergency with unilateral keratoconjunctivitis and peripheral corneal perforation on her left eye. Ophthalmic history was positive for domestic violence with a direct trauma to the same eye 8 days earlier. An ophthalmologic slit lamp examination 2 days after the trauma confirmed conjunctival chemosis without corneal involvement - treatment with gentamicin 3mg/ml eye drops (Gentax, Agepha Pharma) qid was initiated.
Slit lamp examination at presentation at MUI revealed a pronounced left follicular conjunctivitis with massive mucopurulent secretion with a peripheral corneal perforation measuring 4x7 mm involving the superior limbus and adjacent sclera, with iris incarceration and flat anterior chamber. Visual acuity was hand movement, the eye was soft on palpation. Direct microscopy of the secretion showed diplococci, a conjunctival swab was sent to the in-house laboratory for microbiologic testing. The patient was treated with intravenous cefotaxim 2g (Cefotaxim-ratiopharm, ratiopharm GmbH) and fosfomycin 8g (Fomicyt, Astro Pharma GmbH) bid and topical ciprofloxacin 3mg/ml eye drops (Ciloxan, Novartis Pharma GmbH) hourly. The perforated ulcer was immediately closed by suturing an ethanol-preserved human scleral patch graft. 7 days postoperatively the flap sutures loosened and Seidel's sign was observed. A repeat tectonic corneoscleral graft (ethanol-preserved tissue) was transplanted in an elective setting.
Neisseria gonorrhoeae was confirmed in culture, antibiosis was adapted according to sensitivity testing to intravenous ceftriaxon 1g (Ceftriaxon-ratiopharm, ratiopharm GmbH), oral acithromycin 1g (Zithromax, Pfizer Corporation Austria Ges.m.b.H.) qd and gentamicin 3mg/ml eye drops (Gentax, Agepha Pharma) half-hourly. Follow-up after one week showed a clear graft, visual acuity improved to 0.1 on a decimal scale without correction. No further secretion from the eye was noted. Urogenital Neisseria gonorrhoeae infection was clinically excluded for both the patient and her partner, confirming localized ocular gonococcal infection.

Conclusion/Take home message

Neisseria gonorrhoeae keratoconjunctivitis as part of systemic infection is a rare cause of corneal melting or perforation. Localized ocular without genital infection is even rarer with few documented cases in literature only. Associated risk factors in patients' medical history, presence of purulent secretion with corneal involvement and microbial testing aid in attributing the correct diagnosis. Immediate initiation of intravenous

antibiotic treatment combined with surgical repair in case of severe corneal melting is essential in disease management.

Lazaridis et al previously showed that ethanol-stored corneoscleral tissue remaining after preparation of endothelial keratoplasty can be used for subsequent tectonic epikeratoplasty - ethanol preserved tissue is readily available without need of deswelling; it is devitalized tissue preserving stable stromal collagen architecture without risk of graft rejection.

Therefore, it is ideal for use in corneal perforations - as it was successfully used for surgical repair in this case of fulminant Neisseria gonorrhoeae-associated corneal perforation.

Abstract #029

How to save a corneoscleral transplantation failure: Is DMEK possible?

T. Garcin*[a]

[a] *LARIBOISIERE HOSPITAL, Paris, FRANCE*

** Presenting author (garcinthibaud@gmail.com)*

Purpose

A 70-year-old man underwent a rescue corneoscleral transplantation rather than primary evisceration, fourteen days after a 1.8mm clear corneal temporal incision cataract surgery complicated by a pseudomonas aeruginosa endophthalmitis with progressive purulent corneal melting. His background was bilateral high-myopia and non-controlled advanced chronic open-angle glaucoma (IOP 40 mmHg). After a complex 360° limbal peritomy, a corneoplasty as close as possible to the trabeculum, and an AC repair, the prepared 13mm therapeutic corneoscleral transplant (baseline ECD 1580cell/mm^2) was sutured with separate stitches, followed by a conjunctival reconstruction, an AMG and IVI series of antibiotics. No adverse event occurred.

Setting

Lariboisière Hospital Paris and University Hospital Saint-Etienne, FRANCE

Report of case

General antibiotherapy lasted 2 weeks in total. Vision improved without primary transplant failure: 20/20000 before transplantation, 20/400 far and 20/160 near at 2 weeks, 20/200 far and 20/80 near at 6 months (M).

At M6, IOP was 14 mmHg under topical preservative-free double therapy with stable visual field, ECD 1000cell/mm^2 and residual astigmatism 1.3diopters. Fluorometholone 0.1%, ciclosporin 2% and lubricant drops were pursued.

Thereafter, only one AMG was necessary during the first postoperative year, for a small longstanding nasal corneal ulcer. Vision was stabilized (20/200), IOP was controlled (14 to 16mmHg) without any more antiglaucoma drops.

At M15, during a routine control, a complicated abscess was identified, caused by multiple germs (Candida parapsilosis + Propionibacterium acnes + Staphylococcus epidermidis). Healing was obtained after 3 months of combined sequential treatments : 2 AMG, 1 IVI series of antibiotics, a gentle washing of the infected interface stroma-descemet, 2 anterior chamber bubbling (during the first two weeks) and adapted topical treatment.

From M18, progressive corneoscleral transplant failure occurred with a background of a relative limbal deficiency: vision was limited to 20/2000 due to the transplant globally opacified, with monthly recurrent epithelial ulcers dependent to frequent AMG, numerous (200°) deep stromal neovessels growing progressively at the stroma-descemet interface.

Thus, on this singular terrain, we attempted a lamellar transplantation “custom” DMEK: an intrastromal anti-VEGF injection and a gentle diathermy of the deep stromal neovessels, a challenging descemetorhexis, an HLA A B DR matched DMEK transplant, a minimal limbal allograft and an AMG. The aim was to decrease the infectious risk, and increase the comfort and vision if possible.

Conclusion/Take home message

Initial corneoscleral transplantation was an interesting rescue option by removing most of the infectious load, preventing from early phthisis or evisceration and stabilizing the non-controlled advanced glaucoma background.

Nevertheless, the long-term prognosis was rather predictable and fragile, considering the infectious background, the risk of limbal deficiency and the high-risk of allotransplant rejection.

This “Custom” DMEK attempted on this unique terrain, kept the global integrity of the globe, and allowed to extend eye structural and functional rescue, with a relatively minimal post-retransplantation treatment (only fluorometholone 0.1%, ciclosporin 2%, autologous serum drops). Thirty-two months after the initial corneoscleral transplantation, 14 months after this first in human "custom" DMEK, the patient has normal IOP, no pain, normal macular profile, and stable vision (20/200).

Abstract #030

A Case of Successful Re-DSAEK with Ultra Thin Graft in an Elderly Glaucoma Patient.

I. Gardeli*[a], N. Ktistakis[a]

[a] *GNA G. GENNIMATAS, OPHTHALMOLOGY CLINIC, CORNEA DEPARTMENT, Athens, GREECE*

** Presenting author (ioanna.g.gardeli@gmail.com)*

Purpose

To present a case of re-DSAEK due to failure of the existing graft, using an ultra thin new graft in an 81 year old female patient.

Setting

The patient underwent the first transplantation (DSAEK) 10 years prior at our transplantation unit in G. Gennimatas cornea department and was under constant observation since then.

Methods

The case is about an elderly patient with clear medical history. Her ophthalmological history is consistent with glaucoma under treatment and DSAEK procedure in the left eye (OS) 10 years prior. She was under constant observation and failure of the graft was noted. A second DSAEK procedure was performed by using an ultra thin graft of 41 μm. The postoperative course was uneventful and the patient recovered 20/25 vision.

Results

The surgery was very challenging, as the management of an ultra thin graft requires special maneuvers in order not to injure the graft and loose endothelial cells.

Conclusions

Using ultra thin grafts offers a better visual outcome for the patient by reducing the hypermetropic shift. Ultra thin DSEAK offers lesser complication rates and comparable post-operative endothelial cells to DMEK, upon reviewing the literature.

Financial Disclosure of all authors

none

Abstract #031

Regrafting DALK - the challenging surgical and medical management in a case of multiresistant fungal keratitis

A. Gheorghe[a], A. Arghirescu[a], A. Onofrei[a], A. Coleasa*[a]

[a] *EMERGENCY EYE HOSPITAL, Bucharest, ROMANIA*

** Presenting author (alina.gheorghe.g@gmail.com)*

Purpose

To report the exceptionally complex surgical and medical management in a multiresistant fungal infection with a suboptimal response to medical treatment. The use of in vivo confocal microscopy provided invaluable insights in early diagnosis and monitoring the treatment response. Deep anterior lamellar keratoplasty (DALK) was performed to eradicate the infection. An episode of infectious interface keratitis prompted us to perform a rescue DALK to prevent intraocular dissemination.

Setting

Cornea Department, Bucharest Emergency Eye Hospital Bucharest

Report of case

A 52 year-old woman, previously diagnosed in July 2023 with fungal keratitis, presented to the emergency department for persistent blurry vision and eye redness in September 2023, despite having undergone topical and systemic antifungal treatment with several antifungal agents. A particular challenge in this case were the persistent negative fungal cultures, despite the highly suggestive clinical aspect. In vivo confocal microscopy was used to both assess the extent of the infection, and to identify the infectious agent. Anterior segment optical coherence tomography (AS-OCT) was used to confirm the infection was confined to the stromal layer. No signs of anterior chamber inflammation were observed. We performed the first DALK procedure. Postoperative evolution was initially good, with a significant gain of visual acuity. Three months after , the patient came back to the Cornea department complaining of a significant loss of visual acuity and eye redness. Clinical examination revealed a peripheral infiltrate on the donor cornea, highly suggestive of a fungal infection. IVCM revealed a combined fungal and acanthamoeba infection; acanthamoeba was identified both superficially and in the deep stroma. Fungal cultures identified a multiresistant fungus. Intrastromal injections with antifungal agents and interface washout were added to the systemic and topical treatment, however the response was poor, prompting us to perform a second DALK in December 2023 to prevent an intraocular extension of the infection.

Conclusion/Take home message

Outcomes in fungal keratitis, especially those with negative fungal cultures, are usually very poor, especially when the infection extends into the deep stroma. PREVENTING INTRAOCULAR DISSEMINATION IS KEY FOR OUTCOME IMPROVEMENT. IIn these cases, IVCM supplies the surgeon with information that might lead to an earlier diagnosis, as well as provide a way to monitor the evolution and to more accurately quantify treatment response.

Abstract #032

Descemet membrane endothelial keratoplasty in two cases with significant central corneal opacities and poor visualization

A. Gheorghe[a], A. Arghirescu[a], A. Onofrei[a], A. Coleasa*[a]

[a] *EMERGENCY EYE HOSPITAL, Bucharest, ROMANIA*

** Presenting author (andrei.coleasa.mg@gmail.com)*

Purpose

To present two cases of Descemet membrane endothelial keratoplasty in patients with Fuchs endothelial dystrophy and bullous keratopathy following cataract surgery, with significant central corneal opacities, where iOCT was a valuable tool in maximizing postoperative outcomes by understanding graft dynamics in complex situations.

Setting

Cornea Department, Bucharest Emergency Eye Hospital Bucharest

Methods

Both patients have been previously diagnosed with Fuchs endothelial dystrophy. Both patients have undergone cataract surgery years prior to the Descemet endothelial keratoplasty, with endothelial decompensation followed by the development of bullous keratopathy with stromal fibrosis (case 1) and recurrent epithelial defects with stromal scarring (case 2). Descemet membrane endothelial keratoplasty was performed in both cases, with excellent visual outcomes. While difficult visualization of anterior chamber contents can represent a relative contraindication for performing DMEK in patients with endothelial decompensation, with the aid of iOCT, such cases can be successfully tackled. iOCT is an important tool in understanding graft dynamics.

Results

Corneal clearing with the normalization of corneal pachymetry happens even in cases of longstanding chronic bullous keratopathy, as long as the graft is attached. Deep stromal fibrosis might present difficulties in graft attachment. Postoperatively, in such cases, close monitoring with AS OCT is very important, and in the case of graft detachment, the surgeon can rebubble.

Conclusions

Complex cases with impaired visualization of anterior chamber contents require good understanding of the graft dynamics as well as careful postoperative monitoring, given the preexisting risk factors for graft detachment.These cases require extended surgical experience and understanding of the graft dynamics, both before and after insertion in the anterior chamber.

Financial Disclosure of all authors

None

Abstract #033

Blunt Anterior Lamellar Keratectomy (BALK), a new surgical technique for the management of Reis-Buckler Corneal Dystrophy

M. Ghoreishi*[a], M. Pourazizi[b]

[a] *PERSIAN EYE CLINIC (PEC), Isfahan, IRAN, ISLAMIC REPUBLIC OF ;* [b] *Feiz Hospital, Isfahan, IRAN, ISLAMIC REPUBLIC OF*

** Presenting author (ghoreishi35@gmail.com)*

Purpose

Different surgical techniques such as manual superficial keratectomy, excimer phototherapeutic keratectomy (PTK), and lamellar keratoplasty have been used for the management of advanced cases of Reis-Buckler Corneal Dystrophy (RBCD). In this study, we introduce a modified surgical technique called BALK to manage these cases.

Setting

Persian Eye Clinic and Parisian Vision Science Institute, a private clinic in Isfahan, Iran

Methods

Patients with a clinical diagnosis of RBCD with significant visual impairment were selected. Under topical anaesthesia, the interface plane of normal and affected corneal lamella was reached with a blunt spatula. After dissection and separation, anterior lamella was resected and removed, leaving clear underlying stroma.

Results

Twelve eyes of 7 patients were treated. Corrected distance visual acuity improved significantly from 0.62 ± 0.67 logMAR to 0.21 ± 0.23 logMAR after a mean follow-up of 45.3 ± 31.1 (range 6-84) months. Three eyes had mild recurrence which did not require retreatment. Tow eyes had recurrent erosion which improved with bandage lenses. No other complications occurred.

Conclusions

Blunt Anterior Lamellar Keratectomy (BALK), resulted in improved uncorrected and corrected visual acuity and corneal clarity in a series of cases with clinical diagnosis of RBCD. To our knowledge, this technique has not been employed previously.

Financial Disclosure of all authors

None of the authors has any financial disclosures

Abstract #034

Storage of corneas with predissected Descemet membrane in an active storage machine.

P. Goin*[a], S. Poinard[a], O. Dorado[a], Z. He[a], P. Gain[a], AS. Gauthier[b], G. Thuret[a]

[a] *UNIVERSITY JEAN MONNET, Biology, Engineering and Imaging for Ophthalmology, BiiO, Saint-Priest-En-Jarez, FRANCE ;* [b] *Department of Ophthalmology, University Hospital of Besançon, Besancon, FRANCE*

** Presenting author (paulgoin51@gmail.com)*

Purpose

Endothelial keratoplasty is the most frequent corneal transplantation. To reduce surgical time, corneas are often predissected in eye banks, 2 to 4 days before surgery. Extending storage duration without compromising endothelial survival would offer much more flexibility. We previously demonstrated the superiority of an active storage machine (ASM) over organ culture (passive) for whole corneas. Aims: to measure the endothelial viability of pre-dissected DMEK after 3 and 10 days of storage in our ASM in a preclinical study.

Setting

Translationnal research conducted in our university laboratory "Biology, engineering and imaging for Ophthalmology" (BiiO, St-Etienne)

Methods

In this preclinical study, corneas were predissected, leaving the endothelium attached only by a small central area. The endothelial cell density (ECD in cells/mm^2), thickness and transparency of corneas were measured before graft preparation. After randomization they were stored in the same commercial organ culture medium, either in the ASM (21 mmHg, 2.6 µL/min) or in a sealed flask, for 3 or 10 days. Final assessment consisted of measuring the viable endothelial cell density, corneal thickness, and assessing the expression of CD166 and NCAM, ZO-1 (morphology and junctions), Na^+/K^+ATPase (endothelial pumps) and COX-IV (mitochondriae) by immunostaining.

Results

Initial ECD was comparable in both groups for the 2 storage periods. The DMs did not fold back in either ASM or OC. The viable ECD did not differ significantly between ASM and OC: 2378±501 (ASM) versus 2342±503 (OC) for the 3-day period (n=8 pairs / p=0.624) and 2482±288 (ASM) versus 2579±315 (OC) for the 10-day period (n=5 pairs / p=0.176). Corneas were more transparent and thinner in ASM after 3 (916±86 versus 1193±136µm, p=0.0001) and 10 days (957±128 versus 1220±105µm, p=0.0625). Functional and structural markers studied were expressed in both groups, some were better preserved in the ASM.

Conclusions

The ASM can be used for predissected DMEK for at least 10 days, thus enabling to organize runs of graft preparation and subsequent safe storage while simplifying logistics.

Financial Disclosure of all authors

Sylvain POINARD reports financial support was provided by French Society of Ophthalmology. Gilles THURET (corresponding author) and Philippe GAIN (co-author) has patent #PGa and GT are inventors on "patent US 20160029618A1" submitted by University Jean Monnet that covers "Medical device intended for long-term storage of a cornea, or for ex vivo experimentation on a human or animal cornea". The other authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported.

Abstract #035

Use of Anterior Segment Optical Coherence Tomography (ASOCT) to detect early signs of DMEK graft failure

A. Gomaa*[a]

[a] *BLACKPOOL VICTORIA HOSPITAL, Blackpool, UNITED KINGDOM*

** Presenting author (ahmadgomaa74@yahoo.com)*

Purpose

To describe early signs of Descemet membrane endothelial keratoplasty (DMEK) late clearance and/or graft failure using anterior segment optical coherence tomography (ASOCT)

Setting

Retrospective case series of patients who had DMEK corneal graft done at Blackpool Victoria Hospital in the period from 1st January 2023 to 31st January 2024 and developed late graft clearance and/or graft failure

Methods

Patients who had DMEK late graft clearance (more than one month) or failure despite being attached immediately postoperatively were identified. Retrospective analysis of their ASOCT scans was done. Scans were reviewed to identify ASOCT characteristic patterns among these patients

Results

Five eyes of five patients were included in this case series. All patients were females with mean age 73.6 (range 58-93). All patients had their grafts attached immediately postoperatively. Four patients had air re-bubbling, three of them had more than one episode. Two patients needed repeat of their DMEK corneal graft. ASOCT findings were hyper reflective Descemet Membrane (DM), posterior corneal stromal folds and tenting of DM across stromal folds

Conclusions

DMEK graft function/failure can be detected early postoperatively using the ASOCT. Cases identified should still have re-bubbling done first before attempts to repeat the graft. Lower threshold to have the graft repeated might be helpful in cases demonstrating these ASOCT signs. A larger-scale study needed to validate our findings

Financial Disclosure of all authors

There are no financial conflicts to disclose

Abstract #036

Modified “Double-bubble Technique Assisted by Holding Forceps” in Descemet’s Membrane Endothelial Keratoplasty for Vitrectomized Eyes

T. Hayashi*[a], A. Igarashi[a], H. Yokogawa[b], T. Shimizu[a], A. Kobayashi[b], S. Yamagami[a]

[a] *NIHON UNIVERSITY, Tokyo, JAPAN ;* [b] *Kanazawa UNIVERSITY, Kanazawa, JAPAN*

** Presenting author (takamed@gmail.com)*

Purpose

Several techniques have been developed for graft unfolding approaches in Descemet's membrane endothelial keratoplasty (DMEK). However, despite these techniques, graft deployment and configuration in eyes with deep anterior chambers remain challenging in some cases. Therefore, in this study, we described a modified technique for DMEK in vitrectomized eyes, known as the “double-bubble technique assisted by holding forceps.”

Setting

Nihon university, and Kanazawa university

Methods

This was a retrospective interventional case series. Patients who underwent DMEK between August 2022 and July 2023, including cases after vitrectomy and intraocular lens intracapsular fixation, were enrolled. Briefly, after graft insertion, the first small bubble was injected above the graft to open the roll, and the graft edge was held using a special forceps. The second bubble was injected underneath the graft for fixation, while the graft edge was grasped using the forceps during gas injection. Best spectacle-corrected visual acuity (BSCVA), central corneal thickness (CCT), endothelial cell density (ECD), and incidence of postoperative complications were measured.

Results

Twelve eyes of 12 patients were included in this study (mean follow-up period, 4.2±4.3 months). BSCVA and CCT significantly improved postoperatively ($P<0.001$). The median donor ECD was 2608 [2533-2746] cells/mm^2 preoperatively and 1805 [1351-1996] cells/mm^2 at the last examination (40.3% less than the preoperative ECD of the donor graft). Rebubbling was required in three eyes, and no other postoperative complications or primary graft failure were observed.

Conclusions

The present technique enables safe and feasible DMEK surgery in vitrectomized and pseudophakic eyes and those with a deep anterior chamber.

Financial Disclosure of all authors

No

Abstract #037

Optimized laboratory techniques for assessing the quality of pre-stripped DMEK grafts

Z. He*[a], T. Sagnial[a], S. Ninotta[b], P. Goin[c], I. Aouimeur[a], P. Gain[d], G. Thuret[d]

[a] Laboratory BIIO, UNIVERSITY JEAN MONNET, Saint Etienne, FRANCE ; [b] Eye Bank of Saint Etienne, Saint Etienne, FRANCE ; [c] Department of Ophthalmology, University Hospital of Besancon, Besançon, FRANCE ; [d] Department of Ophthalmology, University Hospital of Saint Etienne, Saint Etienne, FRANCE

** Presenting author (zhiguo.he@univ-st-etienne.fr)*

Purpose

The calcein AM-based endothelial viability assay is a relevant and commonly used laboratory tool for assessing the endothelium of various corneal graft types. However, this method has certain limitations, particularly with pre-stripped Descemet's membrane endothelial keratoplasty (DMEK) grafts. These limitations include suboptimal calcein staining, which prevents rapid and accurate viability analysis, and incompatibility with immunofluorescence (IF), which cannot be performed after the viability assay. In this study, our purpose was to develop technical tricks to overcome these drawbacks.

Setting

This research involves basic experimentation conducted on organ-cultured human corneas.

Methods

Organ-cultured human corneas were utilized. Two strategies were employed to enhance the specific staining of calcein in corneal endothelial cells (CECs): 1. Increase the specific fluorescence intensity by changing the concentration of calcein and the diluent; 2. Decrease unspecific fluorescence by adding the fluorescence quencher trypan blue (TB) after viability assay. After viability testing, the fixed and permeabilized grafts was washed in copious PBS to perform subsequent IF.

Results

The results indicated that calcein at 4µM in Opti-MEM significantly intensified fluorescence by threefold compared to conventional staining at 2µM in PBS. TB effectively decreased unspecific fluorescence, reducing both inter-operator variability by 43% and analysis time by 46%. Additionally, TB highlighted the graft's border and attachment zone between Descemet's membrane (DM) and corneal stroma. Prolonged washing in PBS successfully eliminated residual fluorescent calcein in fixed and permeabilized grafts, enabling double IF after viability assay using Hoechst-calcein (HC).

Conclusions

We propose a simple but efficient method for assessing endothelial viability in pre-stripped DMEK grafts. This involves incubation with 4µM Calcein-AM and Hoechst, diluted in Opti-MEM, followed by rapid TB staining. Our approach provides several advantages, including enhanced calcein staining for improved reliability and speed of analysis, determination of DM status and attachment position, and easy counting of ECD. Additionally, a double IF can be conducted after viability assessment (HC Assay) by washing the graft in PBS for 24 hours. Importanly, these techniques are transferable to other corneal graft types, including PK and DSAEK grafts.

Financial Disclosure of all authors

None

Abstract #038

Development of a Gelatin-Based carrier for Corneal Endothelial Graft Bioengineering

Z. He*[a], M. Coban[a], G. Travers[a], O. Ben Moussa[a], S. Urbaniak[a], P. Gain[b], G. Thuret[b]

[a] *BIIO, UNIVERSITY JEAN MONNET, Saint Priest En Jarez, FRANCE ;* [b] *Department of ophthalmology, CHU de Saint Etienne, Saint Etienne, FRANCE*

** Presenting author (zhiguo.he@univ-st-etienne.fr)*

Purpose

In response to the worldwide shortage of corneas, realistic and promising alternatives, such as bioengineered endothelial grafts, are being developed. A major challenge in the reconstitution of a bioengineered endothelial graft is the development of a suitable carrier that can be easily industrialized and respects the physical and biological properties of a healthy cornea. Aim: to validate and optimize a method for manufacturing a gelatin-based biological carrier, previously selected from the literature.

Setting

This fundamental study was conducted in our research laboratory "Biology, engineering and imaging for Ophthalmology" BiiO, University of Saint-Etienne. No patients or healthy subjects were involved, and no animal experiments were performed.

Methods

Various mold models were designed to create gelatin lamellae, which were cold-solidified at 4°C and cross-linked at 140°C, with the option of a post-treatment using formaldehyde or glutaraldehyde. Physical criteria evaluation included transparency, thickness, strength, and shape memory. Assessments of small molecule and water permeability utilized sodium fluorescein (MW: 376 Da) and Texas-Red Dextran (MW: 10 kDa). Biocompatibility was investigated through the endothelialization of gelatin lamellae by human primary corneal endothelial cells (CECs). The quality of neo-endothelium on the bioengineered endothelial constructs was assessed using the triple Hoechst-Ethidium-Calcein staining, Alizarin Red staining, and DiOC-6/DAPI staining.

Results

Heat-induced cross-linking was crucial for producing thin, solid gelatin lamellae, while chemical treatments improved their shape memory, which was a crucial characteristic to facilitate the surgery during graft unfolding in the anterior chamber of the recipient eye. Untreated (heating only), formaldehyde-treated, and glutaraldehyde-treated lamellae offered satisfactory transparency and thickness (about 30µm). In terms of permeability, all 3 groups of gelatin lamellae showed high diffusion of fluorescein and moderate diffusion of Texas-Red. A monolayer of viable CECs with an endothelial cell density (ECD) greater than 2000 cells/mm^2 was observed on untreated and formaldehyde-treated lamellae, but absent on glutaraldehyde-treated lamellae.

Conclusions

This study demonstrates that gelatin lamellae are promising biological carrier for corneal endothelial graft bioengineering. Ongoing research involves surface modification of these lamellae to enhance ECD and strengthen cell adhesion, and animal experiment.

Financial Disclosure of all authors

none

Abstract #039

A case of a neurotrophic perforated corneal ulcer complicated by the herpesvirus infection after the cosmetic botulinum toxin therapy of the face.

O. Ivanova*[a], G. Drozhzhyna[a]

[a] *SI "THE FILATOV INSTITUTE OF EYE DISEASES AND TISSUE THERAPY OF NAMS OF UKRAINE"., Odesa, UKRAINE*

** Presenting author (ion2009@ukr.net)*

Purpose

To present a case of neurotrophic perforated corneal ulcer induced by a cosmetic botulinum toxin therapy, complicated by the herpesvirus infection.

Setting

For the correction of the aesthetic disorders of facial muscles and skin, the most popular procedure in modern cosmetology is a botulinum toxin (BoNT) therapy. Sometimes, for several reasons, cosmetic BoNT therapy can have a negative effect on muscles and nerve endings, causing various neurotrophic eye disorders.

Report of case

46-year-old patient, was admitted to the Corneal Pathology Department with a peripheral corneal ulcer with descemetocele of irregular shape, and mild infiltration zone. The inflammation has developed the two weeks after a cosmetic BoNT therapy on the face (injections of botulinum toxin around the eyes and in the forehead area). The presence of chronic herpesvirus infection in the anamnesis.

Lamellar/Penetrating keratoplasty 3x5 mm was performed. 1 month after the surgery, a well-adapted clear graft was visualized, visual acuity with maximum correction was 0.8.

1.5 months after the stress, a recurrence of inflammation occurred with partial lysis of the corneal graft.

Taking into account the neurotrophic etiology of the process and lysis of the previous graft, we repeated the Lamellar/Penetrating keratoplasty 6 mm. in diameter with covering the surface of the graft with amniotic membrane.

2 months after the operation, the amniotic membrane was partially resorbed, the graft was semi-transparent, with newly formed vessels in its own layers.

After 18 months, the surface of the cornea was epithelialized, the amniotic membrane was completely resorbed, the borders of the therapeutic corneal graft were not visualized. There is a limited opacification in the own, deep layers of the cornea. Visual acuity with maximum correction was 0.5.

Conclusion/Take home message

Cosmetological botulinum toxin therapy may be complicated not only by a decrease of corneal sensitivity, but also by the development of a neurotrophic perforated corneal ulcer.

The complication that was developed as a result of a stress, as well as the activation of a herpes viral infection, induced a relapse with lysis of the graft.

Thanks to well-timed, adequate surgical treatment with the most gentle approach to the surrounding tissues of the cornea, we were able to stop the inflammatory process and maintain a high visual acuity.

Abstract #040

Corneal Transplant Awareness in Medical Students by Grade and the Effect of Subject-Specific Education on This Awareness Level

A. Kaplan*[a], A. Ayas[a], A. Bilen[a], A. Colak[a], T. Kose[b], O. Barut Selver[a]

[a] *Ege University Department of Ophthalmology, Izmir, TURKEY ;* [b] *Ege University Department of Biostatistics and Medical Informatics, Izmir, TURKEY*

** Presenting author (anilkaplan1@gmail.com)*

Purpose

Corneal transplantation is the most commonly performed and also the most successful transplant surgery worldwide. Medical students, the doctors of the future, will educate the public about organ transplantation and raise public awareness on this issue. The first aim of this study is to evaluate the initial knowledge and awareness of medical students, who are future physicians, about corneal transplantation according to their grade levels, then to provide training to these students under the guidance of a corneal transplant specialist, and finally to evaluate the change in their knowledge and awareness on this subject after the training is completed.

Setting

310 students studying medicine at Ege University from the 1st to the 6th grade

Methods

Students were initially asked to participate in a true/false survey consisting of 20 questions. Later, they were given lessons on corneal transplantation by a corneal transplant specialist who is an Associate Professor of Ophthalmology at Ege University. Immediately at the end of the lessons, the participants were asked to fill out the same survey again. The first answers were compared with the last answers to evaluate the awareness created by the training separately for each question. Kolmogorov-Smirnov, Shapiro-Wilk, Kruskal-Wallis, Dunn with Bonferroni correction, Wilcoxon Signed Ranks and McNemar tests were used. All hypothesis accept a $p<0.05$ as statistically significant.

Results

The number of students saying they had knowledge about corneal transplantation before the training was 25.5%(n = 79). According to pre-test results regarding corneal transplantation, the correct knowledge level of 1st grades was lower than the 5th and 6th grades ($p=0.001$(year-1 vs. year-5) / $p<0.001$(year-1 vs year-6)). Post-test scores were significantly higher than pre-test scores in each year group ($p<0.001$). In addition, post-test scores were significantly higher than the pre-test scores in both groups, those who said they had knowledge about corneal transplantation in the pre-test and those who said they had no knowledge.

Conclusions

Physicians' approach to organ transplantation can significantly determine the level of society's interest in organ donation. One of the most important components that determine physician behaviour is the level of knowledge about organ transplantation. It has been shown that the level of knowledge about corneal transplantation in physician candidates does not increase linearly as the medical school year progresses. In addition, regardless of the level of knowledge, the education on corneal transplantation will increase the knowledge level of every student from the 1st grade to the 6th grade.

Financial Disclosure of all authors

None

Abstract #041

Visual Outcomes of Ultrathin-Descemet Stripping Endothelial Keratoplasty versus Descemet Stripping Endothelial Keratoplasty

A. Karagianni*[a], G. Kimionis[b], K. Droutsas[b], D. Papakonstantinou[b]

[a] *SISMANOGLEIO GENERAL HOSPITAL OF ATHENS AND G.GENNIMATAS GENERAL HOSPITAL OF ATHENS, Athens, GREECE ;* [b] *G.GENNIMATAS GENERAL HOSPITAL OF ATHENS, Athens, GREECE*

** Presenting author (karagianni_anastasia81@yahoo.gr)*

Purpose

To examine the impact of graft thickness (GT) on postoperative stripping automated endothelial keratoplasty (UT-DSAEK) versus conventional DSAEK

Setting

The medical records of all patients who underwent DSAEK at our institute for 2 years were reviewed.

Methods

. After excluding subjects with low visual potential, 34 eyes were divided into two groups based on the postoperative GT as measured with anterior segment optical coherence tomography (AS-OCT): a UT-DSAEK group (GT ≤ 100 μm, n=13 eyes) and a DSAEK group (GT > 100 μm, n=21 eyes). The groups were compared concerning best-corrected visual acuity (BCVA), subjective refraction, central corneal thickness (CCT), GT, and endothelial cell density (ECD).

Results

Preoperative BCVA (logMAR) was 1.035 ± 0.514 and 0.772 ± 0.428 for UT-DSAEK and DSAEK, respectively (P=0.072). At 6 months postoperatively, BCVA was 0.088 ± 0.150 following UT-DSAEK and 0.285 ± 0.158 following DSAEK (P=0.001).

Conclusions

DSAEK grafts with a thickness under 100 μm offered better visual outcomes during the early postoperative period

Financial Disclosure of all authors

Abstract #042

Micro- and macroperforations: how to perform femtolaser-assisted deep anterior lamellar keratoplasty without switching to a penetrating corneal keratoplasty?

K. Katmakov*[a], A. Pashtaev[a], N. Pashtaev[a], N. Pozdeyeva[a], A. Rascheskov[a]

[a] *S. FYODOROV EYE MICROSURGERY FEDERAL STATE INSTITUTION, Moscow, RUSSIAN FEDERATION*

** Presenting author (katmakovkostya@yandex.ru)*

Purpose

Deep anterior lamellar keratoplasty (DALK) has become an elegant and reliable solution in the treatment of numerous corneal diseases: keratoectasia, corneal dystrophy, keratitis, stromal opacities.

The key goal of the surgeon is to leave as little residual stroma as possible above the recipient's Descemet's membrane (DM) or even to form a bed only with DM.

However, the desire to reach this goal sometimes leads to the formation of both micro- and macroperforations. The authors have analyzed various surgical techniques that help to cope with this difficulty.

Setting

S. Fyodorov Eye Microsurgery Federal State Institution, Moscow, Russian Federation

Methods

All surgical techniques are divided into 2 groups. First group: what to do if a perforation of Descemet's membrane occurs. Here the following issues have been considered: central microperforation, central macroperforation, peripheral microperforation, peripheral macroperforation.

Second group: how to avoid the appearance of the DM perforation. Here the following techniques are studied: Double bubble DALK, DALK with blunt-tipped scissors, Groove and peel technique, removal of stroma from the periphery spirally.

We have demonstrated our own clinical video case of central microperforation within the execution of femtolaser-assisted DALK for a patient with keratoconus, stage IV. The planned DALK was successfully completed.

Results

Videos of the above mentioned techniques of the first and second groups have been demonstrated.

We've shown our own clinical video case of central microperforation within femtolaser-assisted DALK for a patient with keratoconus, stage IV, that was successfully completed.

3 months after the cornea transplantation, the level of BCVA is 20/50 (Snellen) and within the process of its checking by high magnification and detailing we do not see the formation of a rough scar. The optical zone is transparent. Central defects always cause concerns about its further healing and the degree of transparency of the damaged area.

Conclusions

DM perforation is a factor that reduces the possibility of successful completion of DALK. However, the proper choice of surgical procedures lets us significantly reduce the percentage of urgently required performing of a penetrating corneal transplantation.

Financial Disclosure of all authors

All authors have no financial interest to disclose

Abstract #043

The Endoart: A Real-World Evidence And Interim Results From A Case Series.

B. Knyazer*[a]

[a] *SOROKA UNIVERSITY MEDICAL CENTER, BEN GURION UNIVERSITY OF THE NEGEV, Beer-Sheva, ISRAEL*

** Presenting author (dr.knaizer@gmail.com)*

Purpose

The EndoArt (EyeYon Medical, Israel) is a new, flexible, 50-mm thin artificial endothelial layer that matches the cornea's posterior curvature and functions as a fluid barrier at the posterior stroma, replacing the diseased endothelium. In this case serial I would like to describe a novel device that may serve as an alternative to Descemet membrane endothelial keratoplasty (DMEK) for the treatment of chronic corneal edema.

Setting

Cornea Unit, Department of Ophthalmology, Academic Setting, Soroka University Medical Center, Ben-Gurion University of Negev, Beer-Sheva, Israel.

Methods

A prospective case series of 13 patients with endothelial failure and poor visual acuity caused by posterior segment pathology were included. Previous glaucoma or corneal surgery was an exclusion criteria. The outcome measures were implant adherence, safety and improvement of central corneal thickness on OCT and visual acuity. The Endoart functions as a mechanical barrier, preventing seepage of fluids form the AC into the corneal stroma. Four patients underwent combined (Phacoemulsification with PC IOL and Endoart implantation) surgery.

Results

The EndoArt was implanted in 13 patients (9 with Bullous Keratopathy and 4 with Fuchs dystrophy). In all patients, EndoArt remained adherent throughout the follow-up period (ranging from 12 to 18 months). Central cornea thickness as observed by OCT was reduced by a mean of 36%, from an average of 750.0 to 481.6 microns. BCVA was improved from an average 1.85 LogMAR pre-operatively to 0.34 LogMAR during the post-surgery follow-up. In all 13 cases, single intracorneal sutures and intracameral C3F8 were used to aid initial adherence of the implant. In 3 patients (25%) one re-bubble procedure was needed post-operatively.

Conclusions

In all patients we observed alleviation of stromal edema and improvement in visual acuity. No pathological thinning, toxic reactions, opacification of the cornea or other side effects, or complications were seen with either patients with EndoArt implantation only, or patients who underwent a combined surgery of EndoArt implantation and cataract extraction. The EndoArt is a novel device that will allow treatment of more patients with endothelial disease as compared with donor tissue (banking) availability. This treatment modality has promising results, but still stays during the development steps.

Financial Disclosure of all authors

BK- None

Abstract #044

Novel Insights into Fuchs Endothelial Corneal Dystrophy through Genetic, Demographic, and Phenotypic Correlations

S. Liu*[a], A. Szabo[a], M. Costa[a], K. Muthusamy[b], P. Liskova[c], S. Tuft[b], A. Davidson[a]

[a] UNIVERSITY COLLEGE LONDON, London, UNITED KINGDOM ; [b] Moorfields Eye Hospital, London, UNITED KINGDOM ; [c] General University Hospital in Prague, Prague, CZECH REPUBLIC

** Presenting author (shaneliusy@live.com)*

Purpose

Fuchs endothelial corneal dystrophy (FECD) is commonly associated with an intronic CTG repeat expansion (CTG18.1) in *TCF4*. Rare pathogenic variants in other genes have also been reported. This study probes links among genotype, ethnicity, sex, and age of first corneal transplant surgery (a surrogate metric for disease severity) in a large, multicentre, genetically characterised FECD cohort.

Setting

Multi-centre retrospective observational study. We recruited 569 FECD patients at Moorfields Eye Hospital (London) and 353 at the General University Hospital (Prague), the majority of whom were scheduled for posterior lamellar keratoplasty.

Methods

Genomic DNA was collected from the participants. We determined proband ethnicity and relatedness from genome-wide SNP array data using FRAPOSA and KING. CTG18.1 repeat length was determined by capillary electrophoresis of CTG18.1 PCR. Cases with one or more expanded alleles (≥50 CTG repeats) were classified as expanded (Exp+). Biallelic unexpanded (Exp-) cases underwent exome/genome sequencing to explore the alternative FECD-associated genes. Correlation was statistically analyzed between genotype status (including CTG18.1 expansion status and repeat length and other rarer genetic causes of disease), with demographic data and phenotype.

Results

CTG18.1 expansion was detected in 80.6% of European cases compared to 37.5% in non-European ($P<0.0001$), conferring a >91-fold increased risk for FECD (OR=91.09, $P<0.0001$) versus controls (n=550). In the Exp+group, the CTG18.1 length was inversely correlated with age-at-first keratoplasty ($r=-0.0859$, $P=0.011$). Females were enriched in the total cohort (58.25%), with a more striking skew seen in the Exp-group (76.1%). Exp+alleles were enriched in the homozygous state compared to controls (Chi-square=218.62, $P<0.0001$). Biallelic Exp+cases had surgery younger than monoallelic cases ($P=0.02$). Pathogenic variants in other FECD-associated genes were identified in <17% of Exp-cases.

Conclusions

We demonstrated that CTG18.1 repeat length is a modifier of FECD severity. The female preponderance in FECD is mainly driven by CTG18.1 independent factors. The enrichment of the homozygous Exp+ allele status in FECD and the younger age of surgery in biallelic Exp+ cases, indicates CTG18.1 allelic dosage elevates both disease penetrance and severity. Interrogation of FECD-associated genes in the Exp- group suggests additional important genetic causes and modifiers remain to be discovered.

Financial Disclosure of all authors

None.

Abstract #045

TOMOGRAPHIC AND TOPOGRAPHIC PREDICTIVE FACTORS OF BIG BUBBLE FORMATION DURING DEEP ANTERIOR LAMELLAR KERATOPLASTY IN KERATOCONUS

L. Lucchino*[a], G. Visioli[a], F. Scarinci[b], CG. Rossella Anna Maria[b], G. Pocobelli[c], A. Lambiase[a], A. Pocobelli[b]

[a] Sapienza University of Rome, Rome, ITALY ; [b] San Giovanni Addolorata Hospital, Rome, ITALY ; [c] University of Rome Tor Vergata, Rome, ITALY

** Presenting author (luca.lucchino@uniroma1.it)*

Purpose

To identify preoperative predictors of Big Bubble (BB) formation during deep anterior lamellar keratoplasty (DALK) in patients with keratoconus (KC).

Setting

San Giovanni Addolorata Hospital (Rome, Italy).

Methods

DESIGN: Retrospective Cohort Study.

STUDY POPULATION: Consecutive KC patients undergoing DALK from January 2021 to July 2023.

OBSERVATION PROCEDURE: Tomographic and topographic data including K-max, K-mean, keratometric astigmatism, thinnest point, mean peripheral corneal thickness, difference between the mean peripheral corneal thickness and the thinnest point (peripheral-minimal corneal thickness), position (central/paracentral) and cone area (%), anterior segment optical coherence tomography (AS-OCT) analysis to assess the severity stage.

MAIN OUTCOME MEASURES: Rate of bubble formation and type; multivariate logistic regression analysis was used to analyse all preoperative parameters in patients with bubble formation vs failure.

Results

Pneumatic dissection succeeded in 98 of 140 eyes (70.0%), with 94 type 1 bubbles (67.1%) and 4 type 2 (2.9%). Bubble formation succeeded more frequently in patients with lower k-max (p =0.032), lower k-mean (p=0.010); higher thinnest point (p =0.017), and lower peripheral-minimal corneal thickness (p=0.009). According to the AS-OCT analysis, bubble formation was more frequent in the lower stages (p <0.001). After the logistic regression (pseudo R2=0.165, cons. 3.28, CI 95% 0.47 to 6.08, p =0.022), AS-OCT classification was found to be the only factor that predicted bubble formation (coeff. -0.73, CI 95% -1.15 to -0.31, p=0.001).

Conclusions

AS-OCT classification is a reliable predictor for BB formation. Tomographic and topographic analysis indicated that a steeper and more ectatic cornea is more prone to BB failure.

Financial Disclosure of all authors

No conflicts of interest to declare for any of the authors

Abstract #046

IRIDO-LENTICULAR DIAPHRAGM RECONSTRUCTION ASSOCIATED WITH DESCEMET'S MEMBRANE ENDOTHELIAL KERATOPLASTY: THE SOLUTION OF A CHALLENGING CASE

L. Magalhães*[a], L. Crepaldi[a], A. Dumont[a], L. Ferreira[a], F. De Araújo[a], L. Palhares[a], B. Trindade[a]

[a] *INSTITUTO DE OLHOS CIÊNCIAS MÉDICAS, Belo Horizonte, BRAZIL*

** Presenting author (larissalimam@gmail.com)*

Purpose

To report a challenging case of bullous keratopathy associated with traumatic sectoral iridotomy and intraocular lens (IOL) decentration in a vitrectomized eye that was treated with lens repositioning, pupilloplasty, and Descemet's membrane endothelial keratoplasty (DMEK).

Setting

Tertiary university public hospital.

Methods

The patient had a previous history of cataract surgery that included an iris lesion, capsular bag detachment, IOL dislocation to the posterior chamber, posterior vitrectomy and IOL implantation in the sulcus. The visual acuity was hands movement and biomicroscopy showed diffuse corneal edema, temporal and superior traumatic iridotomies and decentration of the IOL. We decided to approach this case with IOL repositioning, pupilloplasty and DMEK. The IOL was repositioned in the ciliary sulcus to a more stable orientation. The iridotomies were closed with an iris suture, followed by DMEK.

Results

The procedure was uneventful, the donor graft was successfully attached, and there was significant improvement in vision and anterior segment anatomy.

Conclusions

Despite predictable clinical outcomes and good reproducibility, DMEK is still challenging in some eyes due to certain morphologic characteristics such as anterior chamber anatomy, irido-lenticular diaphragm status and vitreous status. Performing DMEK in patients with instability of this diaphragm and who have previously undergone vitrectomy, can be challenging even for experienced surgeons, as the instability of the anterior chamber can make it complex to opening the graft and create an eminent risk of dislocation into the vitreous cavity. Therefore, initial stabilization of the irido-lenticular diaphragm is essential to maintain a secure anterior chamber floor before proceeding with DMEK.

Financial Disclosure of all authors

All authors declare no financial disclosure.

Abstract #047

DMEK particularities in complex posttraumatic anterior segment reconstruction with a sutureless scleral-fixated Artificial Iris and a 3-piece posterior chamber IOL

I. Manea*[a], V. Dinu[a]

[a] *EMERGENCY EYE HOSPITAL BUCHAREST, Bucharest, ROMANIA*

** Presenting author (maneaioanaa@gmail.com)*

Purpose

To describe the challenges in the surgical approach for Descemet membrane endothelial keratoplasty (DMEK) in a case of posttraumatic anterior segment reconstruction within the context of a scleral-fixated complex comprising an Artificial Iris and a three-piece IOL, using the Scharioth technique.

Setting

Emergency Eye Hospital, Bucharest, Romania. The Cornea Department.

Report of case

Hereby we present a case report of a 46-years-old male patient who was referred to our department for the surgical management of posttraumatic aniridia, aphakia and corneal decompensation, due to penetrating foreign body ocular injury that occured two and a half years prior to the presentation, when the patient also required multiple retinal surgeries including silicone oil tamponade. We performed a two-step surgery for ocular rehabilitation: firstly, sutureless scleral fixation of a CustomFlex Artificial Iris (Human Optics) and a three-piece IOL complex using Scharioth technique. The haptics were inserted into the scleral tunnels at 10, 4 hours. The procedure was followed by Descemet Membrane Endothelial Keratoplasty (DMEK) 6 months later. Case particularities involved using a small 7.25mm graft, due to anterior chamber (AC) pheripheral fibrosis, deep AC, special indirect unfolding maneuvers, to avoid endothelial touch with the silicone material of the Artificial Iris. Posterior chamber slide of the graft was not possible, considering the stability of the iris diaphragm. Complications included scleral erosion of the superior haptic, corresponding to the place of previous perforation, managed by a small corneal patch graft in the first step. One week post-DMEK the patient required rebubble for graft detachment, with a favorable outcome. Follow-up revealed clear, supple cornea, with central corneal thickness reduced drastically from 1000 µm preoperative to 620 µm postoperative.

Conclusion/Take home message

Despite the complexity of ocular advanced reconstructions, such as the presence of an Artificial Iris implant, the DMEK procedure can achieve successful outcomes by carefully considering the particularities of each eye.

Abstract #048

Long term outcomes of a novel artificial endothelial replacement membrane

A. Marcovich*[a]

[a] *KAPLAN MEDICAL CENTER, REHOVOT, ISRAEL, Rehovot, ISRAEL*

** Presenting author (arie.marcovich@gmail.com)*

Purpose

To report twenty-four months safety and efficacy outcomes of an artificial lamellar implantation (EndoArt®) on the posterior surface of the cornea of adult patients suffering from chronic corneal edema.

Setting

Eight of the ten reported patients were part of FIH study. The implantations were performed in Israel (Rambam Medical Center Haifa and Sourasky Medical Center Tel-Aviv), the Netherlands (UMC, Amsterdam), Germany (Universitäts-Augenklinik, Heidelberg), and in India (LV Prasad Hyderabad). Two reported compassionate cases were performed in Germany (Universitäts Augenklinik, Heidelberg).

Methods

The EndoArt® (EyeYon Medical, Ness Ziona, Israel), functions as a water-impermeable layer that is designed to be attached to the recipient's posterior cornea, preventing the inflow of aqueous humor into the stroma, and decreasing corneal edema. Long-term efficacy and safety data, available for ten patients which took part in a multi-center First in Human study (eight patients) and in early compassionate cases (two patients), is presented. Central corneal thickness (CCT) improvement and stability are discussed. Best corrected visual acuity (BCVA) measured over the 24 months period is presented for patients with visual potential.

Results

A significant improvement in CCT was observed after one month and remained stable over 24 months. Mean preoperative CCT of 796±117μm (702μm - 1087μm) improved to 580±113μm and 581±104μm after 12 and 24 months, respectively (n=10, p.value<<0.05). Of seven patients with visual potential, six regained at least 4 ETDRS lines at 24 months. Their vision improved continuosly between 12 and 24 months. One patient returned to baseline BCVA due to consistent partial detachment of the device. No long-term complications, infections or inflammation related to EndoArt® implantation were observed. Implants remained transparent throughout the follow-up.

Conclusions

The EndoArt® implant was found safe and effective, demonstrating an improvement in corneal thickness as well as in visual acuity. Outcomes of ten early cases, from the beginning of the learning curve reveal that when fully attached, EndoArt® can alleviate corneal edema and maintain a clear and viable cornea over a long-term period.

Financial Disclosure of all authors

Arie Marcovich is a consultant, patent and share holder of EyeYon medical.

Abstract #049

The genetics of the late-onset Fuchs Endothelial Corneal Dystrophy - An Update

F. Mascarelli*[a], I. Harzallah[b], D. Onitiu[b], H. Vaitinadapoule[c], O. Dorado-Cortez[d], Z. He[c], G. Thuret[e]

[a] INSERM, Paris, FRANCE ; [b] 1. Laboratory for Biology, Engineering and Imaging for Ophthalmology, BiiO, Faculty of Medicine, Health & Innovation Campus, Jean Monnet University, Saint-Etienne, France; 3. Department of Genetic, University Hospital, Saint-Etienne, France, Saint-Etienne, FRANCE ; [c] 1. Laboratory for Biology, Engineering and Imaging for Ophthalmology, BiiO, Faculty of Medicine, Health & Innovation Campus, Jean Monnet University, Saint-Etienne, France, Saint-Etienne, FRANCE ; [d] 1. Laboratory for Biology, Engineering and Imaging for Ophthalmology, BiiO, Faculty of Medicine, Health & Innovation Campus, Jean Monnet University, Saint-Etienne, France; 4. Ophthalmology Department, University Hospital, Saint-Etienne, France, Saint-Etienne, FRANCE ; [e] 1. Laboratory for Biology, Engineering and Imaging for Ophthalmology, BiiO, Faculty of Medicine, Health & Innovation Campus, Jean Monnet University, Saint-Etienne, France; 4.Ophthalmology Department, University Hospital, Saint-Etienne, France, Saint-Etienne, FRANCE

** Presenting author (frederic.mascarelli@inserm.fr)*

Purpose

The genetics of the late-onset Fuchs endothelial corneal dystrophy (FECD) is complex and multifactorial. An overview of our current understanding of the genetics of the FECD will be provided. Intronic CTG trinucleotide repeat (TNR) expansion sequence in *TCF4* is the most frequent genetic risk factors associated with FECD. First, the presentation will describe methods to analyze association of the TNR expansion with FECD, PCR-STR, TP-PCR and amplification-free long-read sequencing. Further, the molecular effects of the TNR expansion will be described. Finally, the talk will debate the hypothesis that subtypes of FECD (with or without mutations) experience the same phenotypic endpoint.

Setting

FECD is the most common primary corneal endothelial dystrophy that may lead to blindness (prevalence was estimated to be > 4%). Corneal transplantation remains the only definitive treatment. FECD is sporadic with no family history or autosomal dominant. Environmental factors include gender, smoking and exposure to ultraviolet light.

Methods

The review was conducted using electronic databases including Web of Science, Scopus and PubMed.

Results

FECD is three to four times more common in women than men. The sequencing described interruption with an unexpanded allele and provided sequence data on expanded alleles greater than 2000 bases in length. There is a considerable heterogeneity in the size distribution of expanded repeats within each patient. The expanded allele cosegregates with the trait with complete penetrance in a majority of families, but cases of incomplete penetrance exist. At least three distinct and non-exclusive TCF4-mediated pathogenic mechanisms, RNA mis-splicing, RNA-mediated toxicity and TCF4 isoform specific dysregulation, have been hypothesized to underpin the pathophysiology of FECD.

Conclusions

Knowledge of the genetics of FECD has considerably advanced within the last decade and has contributed to better diagnosis of this dystrophy as well as opened up the possibility of novel therapeutic approaches based on the molecular mechanisms involved, including pharmacotherapy and targeted molecular therapy. There are still further aspects to explore. For example, a question is that late-onset FECD will eventually be shown to consist of different entities with different pathogenesis, relevance, outlook and treatment, although all FECD cases with or without a CTG18.1 expansion experience the same phenotypic endpoint: presence of guttae and loss of corneal endothelial cells.

Financial Disclosure of all authors

None

Abstract #050

New non-toxic fluorescent marker for quantifying the viability of corneal endothelial cells.

C. Maurin*[a], M. Mentek[a], G. Ulrich[b], A. De Nicola[b], H. Zhiguo[a], P. Gain[a], G. Thuret[a]

[a] BiiO Laboratory, Jean Monnet University, Saint-Priest En Jarez, FRANCE ; [b] Institut de Chimie et Procédés pour l'Énergie, l'Environnement et la Santé (ICPEES), UMR CNRS 7515, École Européenne de Chimie, Polymères et Matériaux (ECPM), Strasbourg, FRANCE

** Presenting author (corantin.maurin@univ-st-etienne.fr)*

Purpose

Viability markers are essential for cellular research and tissue transplantation. However, existing molecules such as Trypan Blue lack specificity and markers used in fundamental research like Calcein-AM are cytotoxic. We therefore synthesized the compound F4267, a non-fluorescent marker that releases fluorescein upon hydrolysis by ubiquitous cytoplasmic enzymes. Aim: to evaluate the quality of F4267 labelling of endothelial cells and its cytotoxicity in immortalized cells and organ cultured endothelium.

Setting

This research involves basic experimentation conducted on organ-cultured human corneas. All samples used in this study were handled in accordance with the tenets set forth in the Declaration of Helsinki. This study was conducted in our university laboratory Biology, engineering and imaging for Ophthalmology (BiiO, University of St-Etienne).

Methods

Efficiency and toxicity of F4267 and Calcein-AM were compared using immortalized cells (HCE-2, Hel-299 and HCEC-B4G12) and the endothelium from paired corneas. The quality of fluorescent labelling was assessed with 40µM F4267 and 4µM Calcein-AM (recommended concentration). F4267 cytotoxicity was assessed at increasing concentrations of 40 µM and 1000 µM on cells and Calcein-AM at 40µM on corneal endothelia with single, repeated or prolonged exposures. After exposure, the viable endothelial cell density (v-ECD) was measured using the triple Hoechst, Ethydium, Calcein-AM staining (Pipparelli et al. IOVS, 2011)

Results

40µM F4267 had a fluorescent labelling quality equivalent to 4µM Calcein-AM, allowing clear differentiation between living, dying and acellular areas. In HCE-2 cells, cytotoxicity was reduced by 19% between 40µM F4267 and 4µM Calcein-AM. 24h exposure on HCEC-B4G12 cells showed no cytotoxicity with 40 and 100µM F4267 but destruction of the cell layer with 4µM Calcein-AM. 40µM F4267 also showed significantly lower cytotoxicity, reducing mortality by 10% (single 45 min exposure) and 17% (repeated 45 min exposure) on stored corneas.

Conclusions

F4267 is a promising marker for quality assessment of corneas during eye banking, allowing safe measurement of v-ECD. The fluorescein released by our compound has an excellent safety profile and is fully compatible for clinical use. The next step is to produce a GMP-compliant batch, transfer it to a routine corneal bank and organize a clinical trial using F4267-exposed corneas.

Financial Disclosure of all authors

CM, GU, ADN, GT, PG, ZH patented the molecule F4267

Abstract #051

Comparison of two commercial organ culture medias: CorneaMax versus Tissue-C

S. Ninotta*[a], D. Toubeau[b], T. Sagnial[a], M. Muraine[b], P. Gain[a], G. Thuret[a], Z. He[a]

[a] *LABORATOIRE BIIO, Saint Priest En Jarez, FRANCE ;* [b] *Banque de cornées CHU Rouen, Rouen, FRANCE*

** Presenting author (sandrine.ninotta@efs.sante.fr)*

Purpose

Corneal storage in organ culture at 31-34°C is the reference method in Europe. It is based on the use of media that are either manufactured locally (by the eye banks themselves or by hospital pharmacies) or commercial products, depending on the legislation in each country. They have broadly similar compositions (Dulbeccos' minimum essential medium + 2% foetal calf serum). In France, eye banks must use commercial media. Corneamax/CorneaJet media (Eurobio, les Ulis, France) have been used for several decades. Tissue-C/Carry-C media (Alchimia-Moria, Anthony, France) have recently become available. Aim: to compare the quality of corneas stored in these 2 media.

Setting

Experimental studies conducted in our university laboratory Biology, engineering and imaging for Ophthalmology (BiiO, St-Etienne), in the eye bank of Rouen and in the eye bank of Saint-Etienne. We used pairs of corneas not suitable for transplantation. After randomisation, one cornea was stored in CMax, the other in Tissue-C.

Methods

Two complementary independent studies were carried out. In Rouen, on 18 pairs, endothelial cell density (ECD, cells/mm^2) was measured using the routine method (0.9% NaCl + Trypan Blue + image analysis) at D10, D30, then after 4 days in deswelling medium. At Saint-Etienne, on 10 pairs, ECD was measured at D4 and D28 using the routine method and then after 2 days of deswelling, this time using the Hoechs-Ethidium-Calcein triple staining (see Pipparelli, IOVS2011) which provided a robust measure of viable ECD. We also measured corneal thickness using OCT. Statistics were done using non parametric paired tests.

Results

For the Rouen series: ECD were comparable at D10 (2368±415 in Cmax vs 2254±510 cells/mm^2 in Tissue-C, p=0.112), and higher in CMax at D30 (2202±403 vs 2004±434 in Tissue-C, p=0.008) and in CJet at D34 (2088±399 vs 1852±419 in Carry-C, p=0.019). For the St-Etienne series: ECD were comparable at D4 (2516±453 in Cmax vs 2559±401 cells/mm^2 in Tissue-C, p=0.579) but the viable ECD (in the central 8mm diameter) was higher in CJet at D30 (1647±324 vs 1436±235 in Carry-C, p=0.018). Notably, in Carry-C, some corneas showed increased cell death in the periphery and in centripetal folds. Final thicknesses were comparable.

Conclusions

Our two independent studies are consistent and show the superiority of the CorneaMax/CorneaJet over Tissue-C/Carry-C in terms of endothelial viability after storage for 4 weeks. The difference appears to be accentuated after deswelling. It should be remembered that banks do not routinely measure ECD after deswelling and may therefore miss this difference. Noteworthy, inter-donor variations are increased by the Tissue-C/Carry-C: for some donors, while a cornea resists well in CorneaMax/CorneaJet, the paired cornea suffers significant endothelial mortality in Tissue-C/Carry-C. For other donors, endothelial survival may be identical. The organ culture media from these 2 manufacturers are therefore not equivalent.

Financial Disclosure of all authors

No conflict of interest

Abstract #052

Acrophialophora levis Infection Following Contaminated Descemet's Stripping Automated Endothelial Keratoplasty Graft: A Unique Case Report.

A. Pairó Salvador*[a], N. Anglada Masferrer[b], J. Seco Orriols[c], S. Garcia Hidalgo[b], A. Arnaiz Camacho[b], T. Pablos Jiménez[a], L. Bisbe Lopez[b]

[a] HOSPITAL UNIVERSITARI VALL D'HEBRON, Sant Cugat, SPAIN ; [b] HOSPITAL UNIVERSITARI VALL D'HEBRON, Barcelona, SPAIN ; [c] HOSPITAL CLÍNIC DE BARCELONA, Barcelona, SPAIN

* Presenting author (armand.pairo@vallhebron.cat)

Purpose

Our aim is to present the case of an immunocompetent patient who underwent Descemet's Stripping Automated Endothelial Keratoplasty (DSAEK), with the introduced graft being contaminated by *Acrophialophora levis*, an extremely uncommon fungus. Despite keratitis being the 2nd or 3rd most common form of infection in humans, we have not found any reported cases of infection by this fungus following a corneal transplant.

With this case, we aim to contribute to a better understanding of the behavior of this fungus and to share the management approach we adopted for a complex case as described below.

Setting

According to a systematic review from April 2023, only fourteen reported cases of human infections by *Acrophialophora* have been described.

Acrophialophora is a genus comprised of 16 species, with the subspecies *A. levis* being the second most common in causing infections in humans, surpassed only by *A. fusispora.*

Report of case

We present the case of an 85-year-old male patient with pseudophakia in both eyes. In 2018, he underwent DSAEK in the right eye due to keratitis caused by herpes simplex virus. The patient's relevant systemic history includes atrial fibrillation treated with acenocoumarol and aortic stenosis.

During the June 2021 follow-up appointment, the patient had a visual acuity of 20/25 in the right eye and 20/30 in the left eye, with no signs of rejection or graft failure in the corneal transplant. In April 2023, the visual acuity in the right eye decreased to 20/100, and the examination revealed diffuse microcystic corneal edema and Descemet's folds. Based on these findings, the patient was diagnosed with graft failure, and a new DSAEK was proposed as a solution.

One month later, a re-DSAEK was performed, subconjunctival cefuroxime was administered at the end of the surgery. As per protocol, samples from the graft preservation fluid and the corneal ring were obtained for microbiological study through culture. The day after the procedure, a paracentral membrane adhered to the endothelium was observed. Fungal culture revealed a filamentous fungus that our expert microbiologists could not identify, leading to the sample's submission to the national microbiology center in Majadahonda. The identification confirmed the presence of A*crophialophora levis*.

Anterior segment photographs were taken, and the case was documented with anterior segment optical coherence tomography to discuss the case with other expert corneal specialists.

Despite the endothelial plaque not appearing to increase in size, it was deemed advisable to remove the graft, especially because stromal edema was observed in the plaque area. Intracameral voriconazole and cefuroxime were administered after graft removal, and one month later, a re-re-DSAEK was performed. The patient's visual acuity one month after re-re-DSAEK was 20/66, with no evidence of the fungus, rejection, or graft failure.

Conclusion/Take home message

Acrophialophora levis is an opportunistic fungus that, due to its rarity, is challenging to diagnose and treat, given the lack of well-established treatment guidelines. It tends to cause challenging ophthalmic infections, especially in immunocompromised patients. Effective management requires good communication between the ophthalmologist and the microbiologist.

Voriconazole is reported to have higher susceptibility to *Acrophialophora* than other antifungal agents. The isolated fungus in this case was also sensitive to voriconazole.

As of today, we have not found other reported cases of *Acrophialophora levis* infection due to contaminated corneal transplantation. There is a lack of scientific evidence to determine if graft removal is necessary. However, considering the aggressiveness of this fungus in some patients described in the literature, we believe that graft removal is the best option.

Abstract #053

Big Bubble versus preDescements (manual dissection) Deep Anterior Lamellar Keratoplasty for corneal stromal pathology at a tertiary referral hospital - long term outcomes and complications.

M. Panagiotopoulos*[a]

[a] *CORNEA AND ANTERIOR SEGMENT DEPARTMENT, OPHTHALMOLOGY CLINIC, ÖREBRO UNIVERSITY HOSPITAL., örebro, SWEDEN*

** Presenting author (marios.p72@yahoo.com)*

Purpose
The aim of this retrospective comparative observational study is to compare outcomes between Big Bubble DALK and preDescemets DALK for the treatment of keratoconus and other stromal pathology.

Setting
Cornea and Anterior Segment Department, Örebro University Hospital, Örebro, Sweden.

Methods
All patients, 39 eyes of 39 patients, with no underlying comorbidities preoperatively, undergoing BB and preDesc DALK due to keratoconus (n=26), stromal dystrophies (n=11) and stromal scars (n=2) with a follow up of 36 to 132 months, were identified through the local database. BCVA (Snellen) at 6, 24 months and at latest follow up respectively, postoperative IOP and any complications and for preDescements DALK, residual stroma, was collected from medical charts.
Comparison between preop and postop BCVA in each group and between postop BCVA between the two groups was performed by Wilcoxon signed rank test and Mann-Whitney U test respectively.

Results
For BB DALK (n=22) median BCVA was 0,1 preop, and 0,4, 0,6 and 0,7 at 6, 24 months and at latest follow-up postop respectively. For preDesc DALK (112 μm mean residual stroma) (n=17) median preop BCVA was 0,1 and 0,2, 0,4 and 0,4 at 6, 24 months and at latest follow-up postop respectively. The difference between preop-BCVA and at latest follow-up was significant for both groups, (p=.00014) and (p=.01878) respectively. Rebubbling due to MD detachment was performed successfully on two eyes. One case of rejection in either group was treated successfully. One eye in either group developed glaucoma.

Conclusions
In accordance with previous studies, DALK (both Big Bubble and PreDescemets) seems to be a safe option, with low complication rate in cases with corneal stromal pathology but healthy endothelium and significantly increases visual acuity. Eyes on which BB DALK was performed successfully, achieved better median visual acuity at all time points postoperatively compared to preDesc DALK, however not statistically significant. This may be due to small sample size.

Financial Disclosure of all authors
None

Abstract #054

Tissue-engineered endothelial keratoplasty (TEEK) build using a Femtosecond laser cutting of crystalline lens anterior capsule

L. Parveau*[a], O. Ben Moussa[a], I. Aouimeur[a], T. Sagnial[a], Z. He[a], P. Gain[a], G. Thuret[a]

[a] *BIIO LABORATORY, Saint Priest En Jarez, FRANCE*

** Presenting author (coulomb.louise.c@univ-st-etienne.fr)*

Purpose

Currently, corneal blindness affects over 10 million individuals worldwide, emphasizing the critical shortage of corneal donations. To address this challenge, bioengineering of endothelial grafts represents a promising alternative to donor corneas. As half of the corneal transplantation performed worldwide are endothelial keratoplasties, their replacement by a bioengineered equivalent would have a very significant impact on the total number of corneal blindness treated. Aim: to report the bioengineering of tissue-engineered endothelial keratoplasty (TEEK) comprising the femtosecond laser (FsL) cut of the crystalline lens capsule, a chemical-free decellularization method and the seeding of human corneal endothelial cell (hCECs).

Setting

This research involves basic experimentation conducted on human crystallin lens and organ-cultured human corneas. All samples used in this study were handled in accordance with the tenets set forth in the Declaration of Helsinki. This study was conducted at the BiiO laboratory located in Saint Etienne, France.

Methods

Whole lenses were blocked in a custom-made holder designed to facilitate the centration during laser cutting. The use of whole lenses (9-10mm in humans) allowed obtaining 8 mm-diameter anterior lens capsule discs (LCD). Asymmetric peripheral marks were also cut to indicate its orientation. Following manual dissection of the LCD, lens epithelial cells were eliminated by immersion in water for 3 days. hCECs were cultivated using conventional methods until passage 4 and were seeded at a density of 1900cells/mm² onto the LCD spread in a cell culture insert. TEEKs were monitored for cell density and viability over 4 weeks.

Results

Lens stored in organ culture media for various durations (from 9 to 163 days) were used. The FsL cutting process, performed in a sterile sealed container, was reproducible. Intact LCD of 8mm diameter, with 3 asymmetrical marks were easily detached from the lens. Immersion in sterile water for 3 days allowed completely eliminating cell debris. Throughout a four-week culture period, seeded hCECs maintained their density, viability (99,3%), and morphology. TEEK could be then handled like native endothelium dissected from donor corneas and behaved similarly.

Conclusions

We developed a bioengineering process for TEEKs using LCD that are by definition biocompatible. In our experience, 70% of corneal donors are phakic and could then become lens donors. The process is easily transferable to GMP standards to create TEEK that exactly mimics endothelial grafts dissected from donor corneas.

Financial Disclosure of all authors

Abstract #055

Study of human corneal thickness during storage into an active storage machine (ASM)

L. Parveau*[a], C. Perrache[a], Z. He[a], E. Crouzet[a], S. Urbaniak[a], P. Gain[a], G. Thuret[a]

[a] *BIIO LABORATORY, Saint Priest En Jarez, FRANCE*

** Presenting author (coulomb.louise.c@univ-st-etienne.fr)*

Purpose

Our team has developed an active storage machine (ASM) that separates an endothelial and epithelial chamber, in order to recreate *ex vivo* the equivalent of intraocular pressure (IOP) and the renewal of the medium(s) circulating in the 2 chambers. This ASM is transparent for non-invasive observation of the cornea. It improves the survival of corneal endothelial cells compared to passive storage in the same culture medium, demonstrating the essential role of IOP in endothelial function and so in corneal physiology. Aim: presenting a series of experiments that will allow for a better understanding of corneal physiology in the ASM.

Setting

This research involves basic experimentation conducted on paired organ cultured human corneas from different sources. All corneas used in this study were handled in accordance with the tenets set forth in the Declaration of Helsinki. This study was conducted at the BiiO laboratory located in Saint Etienne, France.

Methods

Experiment 1: intact corneas were compared to their paired corneas without endothelial cells (ECs), removed using a microsponge, leaving the Descemet's membrane (DM) intact (n=5). Experiment 2: after EC removal from both corneas of each pair, one cornea was seeded with cultivated primary ECs and the other with trabeculum fibroblasts (n=2). All corneas were then stored for 21-days into the ASM (21mmHg and 2.6µL/min) in CorneaMax (Eurobio). Thickness was monitored by Optical Coherence Tomography (OCT). At the end, cell viability was measured using the triple Hoechst-Ethidium-Calcein staining (Pipparelli, IOVS2011) and cell phenotype by immunostaining and red-alizarine staining.

Results

Exp1: corneas with and whithout ECs were both partially deswollen into the ASM: -12±8% for intact corneas (from 1067±118 to 757±31µm) *versus* -28±9% for corneas without ECs (from 1090±86 to 950±66µm) (p=0.0313). Preserved cellular morphology and viability was confirmed for the intact corneal endothelium, while the others exhibited absence of ECs. Exp2: CT of corneas with ECs stabilized at -37±11% (from 1123±82 to 702±74µm) *versus* -31±9% (from 1134±90 to 786±37µm) for cornea with fibroblasts.

Conclusions

The ASM is an unprecedented tool for studying corneal behavior in a customizable environment. The restoration of IOP has its own mechanical effect that limits swelling of the posterior layers of the stroma. Adding a cell barrier without pumping function moderately increases stromal deswelling. Adding normal ECs had not supplementary effect suggesting that pumping function are not activated in these experimental conditions. The slightly higher thickness into the ASM than *in vivo* suggests that the composition of the organ culture medium can still be improved.

Financial Disclosure of all authors

Abstract #056

TACROLIMUS 0.1% OPHTHALMIC SOLUTION: CORNEAL AND INTRAOCULAR PENETRATION STUDY

M. Quirke*[a], F. Lamoureux[a], G. Gress[a], A. Ganem[a], T. Charpentier[a], M. Muraine[a], J. Gueudry[a]

[a] *CHU DE ROUEN, Rouen, FRANCE*

** Presenting author (maximequirke@gmail.com)*

Purpose

Tacrolimus is a molecule currently used in eye drops for its immunosuppressive properties in various ocular surface pathologies as a corticosteroid-sparing agent. Its action could also be beneficial in preventing corneal graft rejection, but its hydrophobic nature theoretically results in low intraocular penetration.
No recent study has measured its penetration into each individual corneal layer (epithelium, anterior stroma, posterior stroma, endothelium).
The aim of this study is to investigate the corneal and intraocular penetration of 0.1% tacrolimus eye drops.

Setting

This was an interventional, monocentric study conducted in the Medical Training Center of Rouen, France, during September 2023 involving 16 rabbits randomly divided into 4 groups.

Methods

Tacrolimus was instilled bilaterally in 3 rabbits per group, morning and evening for 5 days, the 4th rabbit in each group serving as a negative control. Each group was defined by the time interval between the last instillation of 0.1% tacrolimus eye drops and corneal sampling. On the 5th day, biological samples were collected, including conjunctiva, corneal epithelium, anterior stroma, posterior stroma, corneal endothelium, iris, and choroid/retina. Aqueous, vitreous, and serum samples were also collected. A total of 287 samples were analyzed.
The concentration of tacrolimus in each sample was determined using liquid chromatography coupled with tandem mass spectrometry.

Results

Mean tacrolimus concentrations (ng/mg) at various time points post-instillation:
Corneal epithelium - 12.794 (2 hours), 7.550 (6 hours), 8.527 (11 hours), 3.333 (24 hours);
Anterior stroma - 0.436 (2 hours), 0.232 (6 hours), 0.163 (11 hours), 0.117 (24 hours);
Posterior stroma - 0.341 (2 hours), 0.212 (6 hours), 0.108 (11 hours), 0.112 (24 hours);
Corneal endothelium - 4.125 (2 hours), 2.494 (6 hours), 1.531 (11 hours);
Iris - 0.029 (2 hours), 0.022 (6 hours), 0.018 (11 hours), 0.009 (24 hours);
Conjunctiva - 0.276 (2 hours), 0.187 (6 hours), 0.374 (11 hours);
Choroid/retina - 0.022 (2 hours), 0.020 (6 hours).

Conclusions

Within the cornea, maximal concentrations of tacrolimus are found in the epithelium and endothelium, with peak concentrations at 2 hours of 12.794 ng/mg and 4.125 ng/mg, respectively. The tissue concentrations measured are thus significantly higher than those described as lower limits of efficacy in the transplantation of other solid organs (0.030-0.100 ng/mg).
The 0.1% tacrolimus eye drops therefore theoretically have sufficient penetration to effectively exert their anti-rejection activity in the deeper corneal layers. Long-term effects and clinical efficacy of its use remain to be determined.

Financial Disclosure of all authors

None of the authors have any conflict of interest to declare regarding this study.

Abstract #057

Indications and Surgical Techniques for Corneal Transplantation at a Tertiary Referral Center in Azerbaijan from 2008 to 2023

K. Ramazanova*[a], J. Hasanov[a]

[a] *NATIONAL OPHTHALMOLOGY CENTER NAMED AFTER ACAD. ZARIFA ALIYEVA, Baku, AZERBAIJAN*

** Presenting author (khouraman@gmail.com)*

Purpose

The purpose of the study is to review the most common indications and surgical techniques for corneal transplantation in National Ophthalmology Center named after acad. Zarifa Aliyeva, Azerbaijan from 2008 to 2023.

Setting

National Ophthalmology Center named after acad. Zarifa Aliyeva, Baku, Azerbaijan.

Methods

Medical records of all patients, who underwent keratoplasty at National Ophthalmology Center named after acad. Zarifa Aliyeva, Baku, Azerbaijan between January 1, 2008, and December 1, 2023 (from 2013 to 2018 corneal transplantations were legally forbidden) were reviewed retrospectively.

Results

Data were available for 249 grafts of 212 patients, including 172 optical penetrating keratoplasty (PKP), 3 rotational penetrating keratoplasty (rotational PKP), 42 therapeutic/tectonic PKPs, 4 deep anterior lamellar keratoplasty (DALK), 25 Descemet's stripping endothelial keratoplasty (DSEK), 2 Descemet's membrane endothelial keratoplasty (DMEK), 1 Epikeratoplasty.

The most common indication was keratoconus (n=69, 27.7%), followed by aphakic/pseudophakic bullous keratopathy (n=54, 21.7%), corneal opacity and scars (n=34, 13.7%), failed grafts (n=30, 12 %), non-infectious corneal perforations (n=16, 6.4%), infectious corneal ulcers (n=14, 5.6 %), corneal stromal dystrophies (n=11, 4.4%), Fuch's endothelial dystrophy (n=10, 4%). Others include descemetocele, keratoglobus, Peter's syndrome and limbal dermoid.

Conclusions

Keratoconus was the most common indication. The second most common indication was bullous keratopathy. PKP was the most prevalent technique used for corneal transplantation. The prevalence of PKP is mostly due to lack of eye bank and therefore corneal tissue deficiency in Azerbaijan.

Financial Disclosure of all authors

There are no financial conflicts of interest to disclose.

Abstract #058

Endothelial Keratoplasty In Cases Of Penetrating Keratoplasty Failure

MJ. Roig-Revert*[a], G. Rodriguez-Iranzo[a], E. Fernandez-Lopez[a], C. Peris-Martínez[a]

[a] *FUNDACIÓN OFTALMOLÓGICA DE LA COMUNIDAD VALENCIANA (FOM), Valencia, SPAIN*

** Presenting author (mjroig86@gmail.com)*

Purpose

To evaluate outcomes of endotelial keratoplasty: Descemet membrane endotelial keratoplasty (DMEK) and Descemet stripping endotelial keratoplasty (DSAEK) for failed penetrating keratoplasty (PK).

Setting

Fundación oftalmológica de la Comunidad Valenciana (FOM)

Methods

Retrospective study of patients with PK failure who underwent DMEK or DSAEK. Host descemetorhexis was performed in all cases, the diameter of the endothelial graft was 0.5mm undersized in relation to the PK diameter, and the anterior chamber was pressurized with 20% SF6. Pre- and post-operative examinations included: best corrected visual acuity (BCVA), intraocular pressure (IOP), slit lamp examination, fundoscopy, Casia 2 pachymetry, and especular microscopy to asses the endothelium.

Results

Seven eyes with PK failure were included: 4 DMEK and 3 DSAEK. Among the postoperative complications we could highlight: rebubbling (1), synechiolysis (1), cystoid macular oedema (1). The median BCVA significantly improved from 0.01 [NPL-0.15] to 0.2 [0.01-0.7] (p=0.03). In the DMEK group the median corneal pachymetry decreased from 772μm [590-958] to 563 μm [477-619] p=0.034, in the DSAEK group from 833 μm [656-846] to 680 μm [667-754] p=0.294.

Conclusions

In our experience, endothelial keratoplasty is a viable and safer alternative for patients with endothelial PK failure that led to improved vision and graft clarity.

Financial Disclosure of all authors

None of the authors have any financial disclosure

Abstract #059

Cryopreservation of corneal endothelial cells in vitro, ex vivo, and on a tissue engineered endothelial graft

T. Sagnial*[a], M. Coban[a], I. Aouimeur[a], L. Parveau[a], P. Gain[a], G. Thuret[a], Z. He[a]

[a] *UNIVERSITY JEAN MONNET, Saint-Priest En Jarez, FRANCE*

** Presenting author (tomy.sagnial@univ-st-etienne.fr)*

Purpose

In response to the global corneal shortage, realistic and promising alternatives, including cell injection therapy and tissue engineered endothelial grafts (TEEK), both based on mass production of primary culture of corneal endothelial cells (CECs), have emerged. Cryopreservation of whole corneas (primary CEC source), of cultured CECs (in vitro), and/or of TEEK (final products) would dramatically facilitate their industrialization and clinical transfer. Corneal cryopreservation is an old challenge but cryoprotectant evolved and the topic deserves being actualized. Aim: to assess various cryopreservation methods of the 3 cell/tissue types.

Setting

This fundamental study was performed at the "Biology, engineering and imaging for Ophthalmology laboratory" (BiiO, University of Saint-Étienne, France.) using human corneas unsuitable for transplantation.

Methods

Ten cryopreservation media and varying cooling rates (-2°C/min., -1°C/min. or -0,5°C/min. from 4°C to -80°C) were first tested on primary CECs in suspension. After thawing, cells survival was assessed using Trypan blue staining (TC20 Automated Cell Counter ; Bio-rad). Subsequently, the best conditions identified for in vitro CEC were applied to both whole corneas and TEEKs. After thawing, the viable endothelial cell density (v-ECD) was measured using the triple Hoechst-Ethidium-Calcein AM (so called "HEC", see Pipparelli et al. IOVS 2011).

Results

A gradual cooling rate of -1°C per minute proved to induce less cell death. CryoStor CS10 medium (Stemcell Technologies, Vancouver, Canada) was the most effective for *in vitro* CECs, ensuring an average viability of 91± 1% post-cryopreservation. However, when applying the same conditions to whole corneas or TEEKs, v-EDC remained low. At the time of thawing, the cells appeared to detach easily from the Descemet's Membrane (whole cornea) or from the support (TEEKs), resulting in a heterogeneous endothelium, comprising areas with viable cells, areas with dead cells and areas without cells.

Conclusions

Cryopreservation is effective for isolated CECs but remains very challenging for tissues. Rupture of intercellular junctions during freezing may kill cells. Strategies are currently being developed to prevent from cell detachment.

Financial Disclosure of all authors

None

Abstract #060

Development of an Artificial Intelligence-Based Recipient Identification System for Corneal Transplantation

O. Sakin*[a], T. Toprak[b], MA. Selver[c], O. Barut Selver[a]

[a] Ege University Faculty of Medicine, Ophthalmology Department, Izmir, TURKEY ; [b] Dokuz Eylül University The Graduate School of Natural and Applied Sciences, Izmir, TURKEY ; [c] Department of Electrical and Electronics Engineering, Dokuz Eylül University, Izmir, TURKEY

** Presenting author (ozersakin@hotmail.com)*

Purpose

Although corneal transplantation is the most performed tissue transplant in the world annually, approximately 70 patients are waiting for each donor corneal tissue. Defined numerical selection criteria for other tissue organ transplantations are not available for corneal transplantation. Selection of recipients from long recipient lists is performed manually by the authorized operator according to the validity rules and literature information. The aim of this study is to make the corneal recipient selection process faster and more effective by developing an interactive program that simulates the authorized operator with an artificial intelligence-based algorithm.

Setting

Ege University Ophthalmology Department and Dokuz Eylul University Electric and Electronics Engineering Department.

Methods

41 features of 1000 corneal recipients were produced by experts as the recipient dataset. In a similar context, 5 features are created for 50 donors. This synthetic data set, created by taking real patient characteristics into consideration, is used for the training and inference stages of the machine learning method to be developed. The ranking of the experts constitutes the output of the system. In other words, the experts rank the most suitable 20 recipient candidates for each donor. A multilayer perceptron network is trained using 41 features of the recipients and 5 features of the donors.

Results

The network is trained in a pairwise manner and a tournament strategy is used. Thus, the features of two recipients are given as the input together with the donor features. The winning recipient is removed from the list and the same procedure is repeated until 20 recipients are determined. A leave one out procedure is carried out for cross validation. On average, 17 of the 20 candidates are found by the system, which corresponds approximately to 85% of all possible candidates. More importantly, the system always achieves to find the highest ranked nine recipient candidates among the top ten.

Conclusions

In light of the results, the system is found to be significantly effective for the surgeons, who have to select the candidates manually among 1000 candidates. With the development of this program, an interactive system that simulates the authorized operator in selecting the appropriate candidate from the long cornea waiting list will be developed. This flexible system, which does not impose certain parameters, can be trained in different eye banks around the world and has the potential to be widely used.

Financial Disclosure of all authors

The authors have no relevant financial or nonfinancial interests to disclose. Author Ozer Sakin declares that he has no conflict of interest. Author Tugce Toprak declares that she has no conflict of interest. Author Mustafa Alper Selver declares that he has no conflict of interest. Author Ozlem Barut Selver declares that she has no conflict of interest.

Abstract #061

LONG TERM RESULTS OF HORSESHOE COMPRESSIVE LAMELLAR KERATOPLASTY ON ADVANCED PELLUCID MARGINAL DEGENERATION

P. Sauvageot*[a], G. Julio[a], M. Marti[a], J. Alvarez De Toledo[b], R. Barraquer[a]

[a] *CENTRO DE OFTALMOLOGÍA BARRAQUER, Barcelona, SPAIN ;* [b] *OFTALVIST, Barcelona, SPAIN*

** Presenting author (paolasauvageot@gmail.com)*

Purpose

To describe the use of horseshoe lamellar keratoplasty technique in advanced pellucid marginal degeneration (PMD), and to assess its safety, stability and effectiveness in improving uncorrected visual acuity (UCVA), best-corrected visual acuity (BCVA), astigmatism and spectacle tolerance in the long term.

Setting

The setting was a specialist referral corneal surgery center, Centro de Oftalmología Barraquer, Spain. A retrospective review was performed of all patients who underwent a horseshoe lamellar keratoplasty for advanced PMD.All patients had progressive deterioration of BCVA, increased against-the-rule astigmatism, and an ectasia clinically detected and confirmed by corneal topography.

Methods

All surgeries were performed by two expert surgeons. A horseshoe wedge of peripheral ectatic corneal tissue was excised and a similar horseshoe lamellar graft was obtained from a donor eye. Two manual trephines were used to mark the inner and outer limits of the horseshoe pattern. In the receptor, the two circles were not concentric; the outer mark was inferiorly eccentric. Therefore, the distance between the marks was longer in the ectatic inferior peripheral cornea, and a compressive effect was obtained when suturing the borders to compensate the vertical flatenning. No intraoperative complications were observed.

Results

Seven eyes of five male patients with a mean age of 55.5 ± 15.9 years were included and followed for a mean of 75 ±41 months. All the eyes improved BCVA, UCVA and spectacle tolerance.The average reduction in topographic cylinder was -5.8±8.8 diopters. The average reduction in manifest cylinder was -2.6±6.0 diopters. 3/7 eyes required a new surgery due to recurrent astigmatism leading to spectacle intolerance after 20, 34 and 131 months. 1/7 presented a postoperative BCVA ≤ preoperative BCVA after 38 months due to retinal abnormalities. Postostoperative course was uneventful.

Conclusions

Compressive horseshoe lamellar keratoplasty is a safe and effective treatment for advanced pellucid marginal degeneration management with a resultant improvement in BCVA, refractive cylinder and spectacle tolerance on the long term. The trephine asymmetric double mark technique results in a compressive effect and has a low intraoperative and postoperative complication rate.

Financial Disclosure of all authors

None.

Abstract #062

Case of severe acanthamoeba keratitis

K. Sereda*[a], G. Drozhzhyna[a], V. Ostashevskiy[a]

[a] *FILATOV INSTITUTE OF EYE DISEASES AND TISSUE THERAPY NAMS OF UKRAINE, Odessa, UKRAINE*

** Presenting author (evsereda08@gmail.com)*

Purpose

to present a case of severe acanthamoeba keratitis

Setting

State Institution «The Filatov Institute of eye diseases and tissue therapy NAMS of Ukraine», Odessa, Ukraine

Report of case

Patient, 62y.o., complained of decreased vision, photophobia, lacrimation, pain in the left eye. One month ago, after washing with water from a well, his left eye became inflamed. Upon admission to the hospital: BCVA of the right eye - 1,0, BCVA of the left eye - correct light perception. The conjunctiva was hyperemic, corneal abscess, corneal melt to the limbus, no anterior chamber, intumescent cataract. The patient was diagnosed with Acanthamoeba keratitis based on a PCR study of the tear and underwent penetrating keratoplasty d = 9.0/9.5 mm with extracapsular cataract extraction. Chlorhexidine and chloramphenicol were prescribed as well. In 3 weeks the corneal graft was well adapted, the surface was epithelialized. BCVA of the left eye was 0,12. Due to the pandemic, the patient came for an examination after 6 months. The conjunctiva was hyperemic, ulcer and edema of corneal graft, partial failure of interrupted sutures with local ectasia of the border ring. BCVA - correct light perception. Additional interrupted sutures were placed on the graft. At the discharge corneal graft was well adapted with small torpid corneal erosion. In 10 days - graft ulcer recurrence with stromal infiltration and edema, partial ectasia of the border ring, elevated IOP. Photodynamic therapy using methylene blue was conducted. Corneal perforation occurred and the patient underwent tectonic keratoplasty d = 12 mm with simultaneous subscleral sinustrabeculectomy with basal iridectomy and sclerinkleisis and partial blepharorrhaphy. At the discharge - flat filter pad, corneal graft well adapted with interrupted sutures, no fluorescein staining, normal IOP. In 1 month patient returned with no complaints. The conjunctiva was hyperemic, corneal graft melt, perforation, stromal infiltration. The anterior chamber was small, irregular, hypotension. Due to incorrect light perception, repeated corneal perforation, retinal detachment, secondary uncompensated glaucoma, it was decided to perform evisceration of the left eyeball.

Conclusion/Take home message

Treatment of acanthamoeba keratitis is a real challenge for ophthalmologists all over the world. Due to the untimely started antiamebic therapy and despite the complex etiopathogenetic conservative and surgical treatment, the eye could not be saved.

Abstract #063

The burden of medical contraindications to corneal donation, with no medical or scientific basis

G. Thuret*[a], O. Dorado-Cortez[a], S. Poinard[a], M. Epinat[b], F. Collange[c], S. Ninotta[d], P. Gain[e]

[a] UNIVERSITY JEAN MONNET, Ophthalmology Dpt, Saint-Etienne, FRANCE ; [b] Hospital coordination for organs and tissues retrieval, University Hospital, Saint-Etienne, FRANCE ; [c] CIC EC 1408, Clinical Epidemiology, Saint-Etienne, FRANCE ; [d] French Blood Center Auvergne Rhone Alpes, Eye bank, Saint-Etienne, FRANCE ; [e] Laboratory Biology, engineering and imaging for Ophthalmology, Health Innovation Campus, Faculty of Medicine, University Jean Monnet, Saint-Etienne, FRANCE

** Presenting author (gilles.thuret@univ-st-etienne.fr)*

Purpose

The risk of transmission of systemic diseases from donor to recipient is particularly low, since in 50 years and 2.5 million transplants, only 8 cases of rabies, 2 cases of hepatitis B and 2 cases of Creuzfeldt-Jakob disease (CJD) have been well documented. Conversely, other cases of rabies, HIV, hep C, hep B and CJD have not been transmitted. Nevertheless, the list of contraindications (CI) to donation also includes diseases for which no risk has been identified: neurodegenerative diseases, haematological malignancies, melanomas, tumours of the central nervous system and carcinomatous meningitis and lymphangitis.

Setting

Hospital coordination for organs and tissues retrieval, and Ophthalmology department, University Hospital, Saint-Etienne, France

Methods

In order to measure the precise impact of these CI, we analyzed 45 months of exhaustive data from the hospital coordination for organ and tissue procurement at St-Etienne University Hospital (2020-2023). All stages of donor selection were analyzed.

Results

Out of 2349 consecutive potential donors, 1346 (57%) had a CI to donation. Neurodegenerative diseases were the most frequent, accounting for 29% of CIs. Of these, 75% were related to cognitive disorders. The 5 families of diseases that we question concerned 712 donors, corresponding to 30% of the files examined and 53% of all CIs. Of the 1003 deceased without CI, 738 families (74%) were contacted. No objection to donation was received in 52% of cases, enabling 385 procurements to be carried out. Eliminating these 5 CIs would have increased the number of donors by 71% (658 instead of 385)

Conclusions

Eliminating 5 categories of CI to corneal donation that are not based on any medical or scientific rationale would have a major effect on reducing the shortage of donors and combating corneal blindness. We propose that this elimination should be accompanied by a prospective evaluation process, by allocating the corneas of these donors to patients aged 75 and over, and by monitoring them for a minimum of 5 years.

Financial Disclosure of all authors

None

Abstract #064

Management of Postoperative Infectious Scleritis and Other Complications In A Patient With Keratoglobus Undergoing Penetrating Keratoplasty

N. Tutaş Günaydin*[a], R. Erata[b]

[a] *AREL ÜNIVERSITY MEMORIAL BAHÇELIEVLER HOSPITAL DEPARTMENT OF OPHTHALMOLOGY, 442, TURKEY ;* [b] *Health Sciences University. Lutfi Kırdar Kartal City Hospital Department of Ophthalmology, Istanbul, TURKEY*

** Presenting author (drnesrintutas@hotmail.com)*

Purpose

To present the complications and management of choroidal detachment, serous retinal detachment and dacryoadenitis secondary to infectious scleritis in a keratoglobus patient undergoing penetrating keratoplasty.

Setting

University of Health Sciences, Kartal Dr. Lütfi Kırdar Training and Research Hospital, Department of Ophthalmology, İstanbul, Turkey.

Report of case

A 21-year-old female patient presented with poor visual acuity in both eyes due to bilateral keratoglobus. She has a history of corneoscleral perforation in the left eye due to trauma. Corrected distance visual acuity (CDVA) is 20/100 in the right eye and counting fingers at 2 metres in the left eye. Her left eye was aphakic, the pupil was irregular and the sclera was thinned due to the trauma. The patient underwent a large penetrating keratoplasty on her left eye. Suture revision was performed two weeks after the keratoplasty. Subsequently, infiltration and secretion developed in the area of scleral thinning at the site of the previous trauma. Treatment included oral tetracycline, topical and systemic vitamin C, oxytetracycline ointment and topical meropenem drops (50 mg/ml). Staphylococcus epidermidis grew in the wound culture obtained. The patient, who was already receiving topical drops and systemic treatment, was started on a new regimen. Merocel impregnated with linezolid was applied to the wound site for 30-60 minutes, three times a day. This treatment reduced infiltration and secretion.

In the second postoperative month, choroidal serous retinal detachment and inflammatory hypotony developed. Atropine eye drops %1 and oral prednisolone 64 mg were started. At the two-week follow-up, the retinal and choroidal detachment had resolved and the intraocular pressure was normal.

During follow-up, a palpable mass was noted in the lateral orbit. The patient, who was suspected of having dacryoadenitis and whose diagnosis was supported by MRI, was treated with oral amoxicillin-clavulanate for two weeks. The mass eventually decreased in size. On final examination, there was no infiltration or infection in the area of scleral thinning and the posterior segment findings were normal.

Conclusion/Take home message

This case highlights the many challenges and successful management strategies in dealing with postoperative complications associated with infectious scleritis after penetrating keratoplasty in a patient with keratoglobus. In addition, this case involved a novel treatment approach to a localised area of scleritis resistant to topical antibiotic drops.

Abstract #065

An efficient technique for the long-term preservation of SMILE lenticules using desiccation.

A. Vautier*[a], JL. Bourges[b], E. Gabison[c], F. Chaventre[d], C. Albou-Ganem[e], O. Boyer[d], M. Muraine[d]

[a] Angers University Hospital, Angers, FRANCE ; [b] Cochin Hospital, Paris, FRANCE ; [c] Fondation Ophtalmologique Rothschild, Paris, FRANCE ; [d] Rouen University Hospital, Rouen, FRANCE ; [e] Clinique de la Vision, Paris, FRANCE

** Presenting author (vautier.anais@gmail.com)*

Purpose

Small Incision Lenticule Extraction (SMILE) surgery consists of removing a stromal lenticule of a known refractive power. Usually eliminated, it could be advantageously repurposed on demand for refractive or therapeutic purposes. The aim of the study was to evaluate a desiccation protocol for the long-term preservation of human SMILE lenticules and to study their integration in an *in vivo* rabbit model.

Setting

Rouen University Hospital

Methods

Lenticules were retrieved after SMILE procedures in patients, then desiccated according to a novel protocol. Histologic and electron microscopic analyses were performed. Six rabbit eyes were grafted with an inlay technique which consisted in inserting a desiccated lenticule into a stromal pocket. Rabbits were sacrificed at different times between 6 and 24 weeks. Rabbit' corneas were analyzed using optical coherence tomography (OCT), histology and DAPI staining.

Results

Microscopic analysis of desiccated lenticules showed a preserved stromal architecture after rehydration. A decellularization of the lenticules after desiccation was observed without any chemical treatment. All rabbit corneas remained clear after grafting human lenticules and no rejection occurred. OCT showed regular lenticular implantation and no decrease in lenticule thickness. Histologic analysis showed no inflammatory infiltration around lenticules and no nuclear material inside lenticules after 6 months.

Conclusions

In this study, we observed a favorable integration of desiccated SMILE lenticules from human in rabbit corneas. Next, we must investigate the refractive issue of lenticular implantation. Clinical trials are needed to evaluate the use of desiccated SMILE lenticules to treat hyperopia or keratoconus in human.

Financial Disclosure of all authors

None

Abstract #066

Visual recovery after DMEK surgery: predictive role of preoperative stromal ripples

M. Ventura*[a], V. Romano[a], A. Matteo[a], C. Ancona[a], F. Semeraro[a]

[a] *UNIVERSITÀ DEGLI STUDI DI BRESCIA, Brescia, ITALY*

** Presenting author (marica_ventura@libero.it)*

Purpose

To assess the role of preoperative posterior stromal ripples (pre-PSR) on visual acuity recovery and final visual acuity after Descemet Membrane Endothelial Keratoplasty (DMEK) surgery.

Setting

Comparative case series retrospectively analyzing patients who underwent DMEK surgery.

Methods

Patients' demographics and surgical details were collected. Pre-PSR have been identified as stromal waves by performing an anterior segment optical coherence tomography (AS-OCT). The last preoperative and first postoperative available AS-OCT for each patient were analyzed for the presence of pre-PRS.
The difference in longitudinal trends of visual acuity recovery and final visual acuity after DMEK was identified in eyes with and without pre-PRS. Furthermore, the study investigated the frequency of rebubbling and the proportional relative risk of rebubbling in relation to the existence of both preoperative and postoperative posterior stromal ripples.

Results

A total of 66 patients (71 eyes) were enrolled in the study. The presence of preoperative posterior stromal ripples (pre-PSR) was correlated with lower preoperative visual acuity ($p = 0.02$) and greater corneal thickness ($p < 0.001$). Eyes exhibiting pre-PSR achieved comparatively lower final visual acuity values than those without pre-PSR ($p = 0.02$). Cox proportional hazard ratios did not reveal a statistically significant difference in the relative risk of rebubbling associated with the presence of either preoperative or postoperative posterior stromal ripples (all $p > 0.05$).

Conclusions

The presence of pre-PSR is associated with morphological and permanent corneal changes observed in the last stages of endothelial dysfunction. This correlation contributes to a delayed visual recovery and potentially leads to a compromised postoperative best-corrected visual acuity (BCVA). Preoperative posterior stromal ripples may have predictive value for postoperative visual outcomes.

Financial Disclosure of all authors

None of the authors have financial disclosures.

Abstract #067

Outcomes of Corneal Transplant in Childhood Glaucoma

B. Vidal-Villegas*[a]

[a] *HOSPITAL CLINICO DE MADRID, SPAIN, Madrid, SPAIN*

** Presenting author (beatrizvidalvillegas@gmail.com)*

Purpose

To investigate the surgical outcome of different types of keratoplasty in eyes with childhood glaucoma.

Setting

This is an observational retrospective cohort study. We reviewed the medical records of patients diagnosed with PCG or childhood glaucoma who had undergone corneal transplantation at our department from January 2010 to July 2020. Our department is a national tertiary referral center for childhood glaucoma.

Methods

A retrospective review was made of the medical records from 17 eyes of 15 patients who were diagnosed with childhood glaucoma and received a corneal transplantation between January 2010 and July 2020. Patient demographics, intraocular pressure, previous ocular surgery, comorbidities, corneal transplant surgery, and follow-up outcome were collected. The primary efficacy endpoint was graft survival (in months) until failure, the latter being considered as irreversible loss of corneal transparency. Secondary efficacy points were the need for an increase in topical hypotensive therapy and the need for additional surgery.

Results

Seventeen eyes of 15 patients were included, 11 eyes (10 patients) with primary congenital glaucoma and 6 with other types of childhood glaucoma. Corneal transplantation was performed at the mean age of 23.76 ± 14.86 years. Descemet stripping automated endothelial keratoplasty was performed in 13 eyes (76%) and penetrating keratoplasty in 4 (24%). After surgery, 7 (41%) eyes required increased topical treatment and 2 (12%) glaucoma surgery. Twelve eyes (71%) developed graft failure at 24 months, the mean time of survival being 13.88 ± 8.25 months.

Conclusions

Management of corneal decompensation in childhood glaucoma poses a challenge. In this series of childhood glaucoma with corneal transplantations, the survival rate was 29% at 24 months.

Financial Disclosure of all authors

Dr J García-Feijoo is Consultant and Paid instructor for Alimera, Allergan, Elios Vision, Santen, Alcon, Thea, Glaukos and iSTAR. Dr Burgos-Blasco is in the Speaker Bureau for Sifi and Alcon.
Relevant to this article there are no relevant financial disclosures.

Abstract #068

The artificial anterior segment

J. Wiedemann*[a], C. Cursiefen[a], B. Bachmann[a]

[a] *DEPARTMENT OF OPHTHALMOLOGY, UNIVERSITY OF COLOGNE, Cologne, GERMANY*

** Presenting author (johanna.wiedemann@uk-koeln.de)*

Purpose

Here we present a case in which, after perforating sclerocorneal trauma, both the eye and partial function could be preserved by various complex and partly novel prosthetic reconstructive surgeries.

Setting

Department of Ophthalmology, University of Cologne, Cologne, Germany

Report of case

We present an 80-year-old male patient with endothelial decompensation (secondary graft failure) after penetrating keratoplasty (PK) in 2017. The patient had a previous en block excision of an epithelial implantation cyst after a perforating sklerocorneal trauma 60 years ago. Moreover, an artificial iris implantation and cataract surgery were performed with implantation of the IOL into the capsular bag. Due to the zonular defect after en block excision the capsular bag was fixed to the scleral wall by the capsular device AssiAnchor (Hanita Lenses, Israel). Due to secondary graft decompensation after PK, the need for an endothelial surgery occurred. After multiple intraocular surgeries and after graft rejection after PK an endothelial keratoplasty would have been at a high risk for repeat graft rejection.

This patient was considered at high-risk for graft rejection even after traditional Descemet membrane endothelial keratoplasty (DMEK) and therefore the decision was made to implant an artificial endothelial keratoprosthesis (EndoArt®, EyeYon Medical, Israel, CE approved 08/21) instead.

Before implantation of EndoArt®, the best spectacle-corrected visual acuity was 1.9 logMAR and the patient complaint of pain. After surgery the visual acuity increased to 1.0 logMAR after 3 months. The central corneal thickness decreased from 974 µm one week after the operation to 664 µm after 2-6 weeks and 416 µm after 7-2 weeks.

This correlated with a subjective improvement of foreign body sensation and tearing.

Conclusion/Take home message

EndoArt® led to corneal deswelling and improved visual acuity in a patient with multiple previous surgeries and an artificial iris.

Following artificial replacement of the lens and iris, it is now also possible to replace the corneal endothelium with an artificial keratoprosthesis, which appears particularly useful in high-risk situations, but long-term results and larger cohorts are pending.

Abstract #069

Outcomes of Paediatric Corneal Transplantation: A Systematic Review and Meta-analysis

JH. Woo*[a]

[a] *SINGAPORE NATIONAL EYE CENTRE, Singapore, SINGAPORE*

** Presenting author (woojyhhaur@live.com)*

Purpose

To describe the outcomes of corneal transplantation in the paediatric age group, in terms of graft failure, best corrected visual acuity outcomes and complications, as well as the factors which influence graft failure in the paediatric age group.

Setting

Paediatric corneal transplantation is a highly complex field which presents a unique set of challenges. Current literature on the outcomes of paediatric corneal transplantation are focused on reporting graft survival (or failures), postoperative visual acuity and complications. However, no systematic review and critical assessment of such outcomes have been performed.

Methods

Systematic review and meta-analysis of the outcomes of primary paediatric keratoplasty (Penetrating Keratoplasty, PK; Deep Anterior Lamellar Keratoplasty, DALK; Descemet Stripping Automated Endothelial Keratoplasty, DSAEK; Descemet Membrane Endothelial Keratoplasty, DMEK) performed for optical indications. The outcome measures are graft survival (or failure), visual acuity and complications. Eighty five publications met the eligibility criteria and were included in the systematic review.

Results

The proportion of graft failure for PK was 0.33 (95% CI 0.25, 0.41). The proportion for DALK, DSAEK and DMEK were lower at 0.12, (95% CI 0.06, 0.17), 0.04 (95% CI 0.00, 0.09) and 0.10 (95% CI 0.04, 0.25) respectively.
A higher proportion of patients who had DMEK (0.89, 95% CI 0.76, 1) had visual acuity above 20/80 than DSAEK or DALK.
A higher proportion of patients who had PK (0.21, 95% CI 0.15, 0.28) had rejection than those who had DALK or DSAEK. Most of PK failures was due to rejection (0.55, 95% CI 0.40, 0.70).

Conclusions

The purported advantages of lamellar transplantation techniques such as DALK, DSAEK and DMEK over the traditional technique of PK may also apply in the paediatric age group. Graft rejection is a major complication after keratoplasty and is the most common cause of graft failure in these high-risk eyes.

Financial Disclosure of all authors

No financial disclosure

Imaging

Abstract #070

Epithelial basement membrane dystrophy - many faces of map-dot-fingerprint dystrophy shown in confocal microscopy.

A. Agaś-Lange*[a], M. Nocoń-Bratek[a], A. Smędowski[a]

[a] *Gibinski's University Clinical Centre of Medical University of Silesia, Katowice, POLAND*

** Presenting author (anna.agas.lange@gmail.com)*

Purpose

To investigate the characteristics of the epithelial basement membrane dystrophy, also known as fingerprint-map-dot dystrophy or Cogan's microcystic dystrophy.

Setting

The examination was conducted at Gibinski's University Clinical Centre of Medical University of Silesia, Katowice, Poland.

Methods

All patients were examined by slit lamp biomicroscopy followed by evaluation using *in vivo* confocal microscopy (HRT III, RCM, Heidelberg, Germany), focusing on the corneal epithelium and basal membrane.

Results

In confocal microscopy examination, precise visualization of characteristic features of epithelial basement membrane dystrophy is attainable. Superficial changes arise due to disruptions in the processes of basement membrane formation and maturation, along with irregular rotation of epithelial cells. In analyzed patients, it was manifested as thickening, stratification of the basement membrane, and intracellular deposits. The visualization of distinctive morphological subepithelial changes in the form of maps (map-like), swirling patterns resembling fingerprint lines, or haziness resembling dots (dot-like) facilitates the diagnostic process of Cogan's dystrophy.

Conclusions

The presented data demonstrate that *in vivo* confocal microscopy complements slit-lamp examination for assessing patients suspected of corneal dystrophies. Confocal microscopy allows for the precise visualization of even the smallest abnormalities, which may go unnoticed in standard ophthalmic examinations. This method enables the detection of early signs of intracorneal changes and the assessment of their scope and severity. As a result, it allows for the formulation of a precise therapeutic plan and the application of appropriate treatment. The acquired confocal images constitute valuable elements for further monitoring of the disease progression.

Financial Disclosure of all authors

The authors have no proprietary or commercial interest in any materials discussed in this article.

Abstract #071

Far-red, high-resolution, reflection-free images of the anterior segment in retroillumination

A. Ain*[a], S. Poinard[a], T. Lepine[b], O. Dorado-Cortez[a], S. Urbaniak[a], P. Gain[a], G. Thuret[a]

[a] *UNIVERSITY JEAN MONNET, Saint-Priest En Jarez, FRANCE ;* [b] *Institut d'Optique Graduate School, Saint-Etienne, FRANCE*

** Presenting author (anthony.ain@univ-st-etienne.fr)*

Purpose

Retroillumination, a longstanding method in anterior eye segment observation by slit lamp, entails illuminating a patient's dilated pupil with a beam of white light. The practitioner adjusts the slit until the red reflex from the retina's pigmented epithelium appears, allowing direct observation of anterior segment structures. This method, ideal for lens, iris, and cornea details, complements other slit lamp illuminations. However, capturing quality images is challenging due to glare, eye movements, reflections, and limited resolution, even with modern digital slit lamps.

Setting

The imaging device designed by the Biology, engineering and imaging for Ophthalmology lab (BiiO, St-Etienne) was assessed on patients at the Saint-Etienne University Hospital as part of a clinical trial (NCT05717543).

Methods

We developed a system to remove undesired reflections in retro-illumination by modifying a slit lamp (SL990, CSO Scandicci, Italy). This adjustment applied to both the imaging and illumination channels, retaining the standard mechanical functionalities, including independent rotations of the observation and illumination pathways, along with focus and mechanical centering of the observation plane. This ensured ease of use for ophthalmologists.

Results

Our prototype produced images of 4096 x of 3000 pixels for 12,4 x 8,8 mm corresponding to a pixel of 3.45 x3.45 µm, when using the x40 position of the slit lamp magnification changer. In 100% of the cases, one or more clear images on the area of interest were obtained without glare, and without disturbing reflections in most of the cases. Some pseudophakic patients showed minimal to moderate light reflection. The images were sufficiently resolved to allow precise analysis of diseased areas, such as each gutta of the FECD of even cells present in the anterior vitreous.

Conclusions

Our retroillumination device provides high-resolution images of the different structures of the anterior segment, easy to acquire mainly because they do not dazzle patients. Even with the modifications we propose, retro-illumination will remain a frugal technology compared to other imaging methods - which are also undeniably useful - such as OCT, confocal microscopy and their derivatives. We believe that these images have the potential to facilitate the diagnosis and monitoring of many different diseases both in routine use and in clinical trials where they could be used as objective endpoints.

Financial Disclosure of all authors

PG, GT, LP and AA patented the device. No conflict of interest for the others.

Abstract #072

Comparative analysis of tomographic indicators forecasting decompensation in Fuchs Endothelial Corneal Dystrophy

M. Airaldi*[a], ML. Passaro[b], C. Ancona[c], R. Cucco[c], C. Costagliola[b], F. Semeraro[c], V. Romano[c]

[a] Department of Molecular and Translational Medicine, University of Brescia, Brescia, ITALY ; [b] Department of Neurosciences, Reproductive Sciences and Dentistry, University of Naples "Federico II", Napoli, ITALY ; [c] Department of Medical and Surgical Specialties, Radiological Sciences, and Public Health, University of Brescia, Brescia, ITALY

** Presenting author (matteo.m.airaldi@gmail.com)*

Purpose

To compare the performance of three commercially available tomographers (the Pentacam Scheimpflug camera, the SS-OCT Casia, and the blue light slit-scanning tomographer Precisio) in the identification of patterns associated with Fuchs Endothelial Corneal Dystrophy (FECD) decompensation.

Setting

Clinic-based, cross-sectional imaging study.

Methods

Pachymetry maps and posterior surface elevation maps were acquired with the three devices from 61 eyes affected by FECD. The maps were graded according to the evidence of tomographic patterns predictive of FECD decompensation (loss of parallel isopachs, displacement of the thinnest point, and focal posterior depression) by two blind cornea specialists.

Results

The loss of parallel isopachs was significantly less evident in Pentacam pachymetry maps (8% [3%,18%]) compared with both the Casia (31% [20%, 44%], p = 0.01) and Precisio (24% [15%, 37%], p = 0.05). The displacement of the thinnest point was graded as most evident in a significantly higher proportion of Precisio pachymetry maps (43% [31%, 55%]) compared to both the Pentacam (13% [6%, 24%], p = 0.001) and Casia devices (21% [12%, 33%], p = 0.03). There were no significant differences in the identification of focal posterior depression on posterior elevation maps across the three devices.

Conclusions

The identification of patterns predictive of FECD prognosis on pachymetry and posterior elevation maps is possible with different devices. However, their evidence varies across tomographers and results from different devices are not interchangeable.

Financial Disclosure of all authors

The authors declare no financial conflicts of interest or competing interests related to this research.

Abstract #073

Appearance is deceiving and the TCO tells the truth.

P. Alonso Barreiros*[a], C. Llorente La Orden[a], L. Alcalde Blanco[b], E. Mata[a], M. Jimenez Rolando[a], C. De Pablo Martin[a]

[a] *HOSPITAL CENTRAL DE LA CRUZ ROJA SAN JOSE Y SANTA ADELA, Madrid, SPAIN ;* [b] *HOSPITAL 12 OCTUBRE, Madrid, SPAIN*

** Presenting author (paulalons@hotmail.com)*

Purpose

Show the macroscopic image with the appearance of a plaque of severe scleral atrophy and its correlation with an TCO of the anterior pole of the lesion, which shows a scleral invagination, with maintained scleral thickness measured by TCO, at the site of injection of the Aflibercept in the right eye

Setting

Observation

Report of case

An 88-year-old woman who has been under follow-up in our service for 7 years for chronic open-angle glaucoma under treatment with prostaglandins and brinzolamide and exudative age-related macular degeneration in both eyes treated with aflibercept. The right eye has 64 injections and the left eye 44.
6 months ago has appear a lesion that looks like a severe atrophy plaque of about 2 mm in diameter, 3.5mm from de limbus without associated inflammatory signs or pain, covered with healthy conjunctiva
The patient has a visual acuity of 45 letters in the right eye and 40 letters in the left eye, which has not been altered with the appearance of the lesion.
After the appearance of the lesion, aflibercept began to be injected into the upper temporal region and in these 6 months of follow-up, the lesion has remained stable.

Conclusion/Take home message

Show image of what scleral atrophy looks like with choroidal translucency with maintained scleral thickness measured by TCO
Highlight the importance of TCO for the assessment of anterior segment lesions and correlation with the microscopic appearance for correct treatment.

Abstract #074

Evaluating repeatability of corneal curvature and thickness on MS-39 anterior segment OCT through the measurement range

S. Balal*[a], P. Mulholland[a], M. Leucci[a], L. Kandakji[b], D. Gore[a], N. Pontikos[b], B. Allan[a]

[a] *MOORFIELDS EYE HOSPITAL, London, UNITED KINGDOM ;* [b] *University College London, London, UNITED KINGDOM*

** Presenting author (shafi.balal@nhs.net)*

Purpose

The MS-39 (CSO, Italy) is a novel device which combines high resolution anterior segment optical coherence tomography with Placido disk topography. To accurately determine progression of ectasia, 'machine noise' for the measurement device must be accurately defined. The purpose of this study was to comprehensively evaluate the repeatability of the MS-39 tomographer across a large dataset for several measurement parameters.

Setting

The Early Keratoconus Clinic (EKC), Moorfields Eye Hospital, London, United Kingdom.

Methods

A retrospective study was conducted on all consecutive patients' data from the MS-39 from September 2019 to March 2023. The mean, standard deviation within-subject (Sw) and repeatability coefficient (RC) were calculated for Kmax, K1, K2, thinnest corneal thickness (TCT) and thinnest epithelial thickness (TET). The only exclusion criteria were less than 2 repeated measurements under the same conditions (intra-observer) and/or poor-quality scans (as per manufacturer's definition). A robust mixed-linear effects model was performed to derive within-individual variance using RStudio data analysis software. The calculated sample size required for <5% uncertainty in defining the repeatability parameters was n=768 patients.

Results

A total of n=16,817 patients were included in the final analysis with n=115,796 observations. The overall mean (diopters), sW and RCs were: Kmax (52.8D, 0.3D and 0.8D), K1 (44.7D, 0.2D and 0.6D), K2 (48.5D, 0.2D and 0.6D), TCT (477uM, 2.7uM and 7.8uM) and TET (42.1uM, 1.6uM and 4.8uM). The sW and RC for Kmax stratified by severity of keratoconus were: <48D (0.2D and 0.6D), 48-53D (0.25D and 0.7D), 53-58D (0.3D and 0.8D) and >58D (1D, 2.9D).

Conclusions

This is the first large scale powered study defining the repeatability (intra-observer) parameters on the MS-39 anterior segment optical coherence tomographer. Corneal curvatures and thicknesses taken with the MS-39 are highly repeatable. Future studies will define other parameters of clinical interest and devise strategies to further improve scan quality.

Financial Disclosure of all authors

This research was supported by the European Society of Cataract and Refractive Surgeon's (ESCRS) Digital Research Award (OCT-KC). The authors declare no other financial conflicts.

Abstract #075

Congenital anophthalmia and microphthalmia: Diagnosis and early reconstructive treatment

B. Bousellam*[a], Y. Bouhafra[a], HA. Eddaoui[a], Y. Bennani[a], M. Liman[b], M. Belmekki[a]

[a] *HOPITAL CHEIKH ZAID DE RABAT, Rabat, MOROCCO ;* [b] *LABORATOIRE LIMAN, Casablanca, MOROCCO*

** Presenting author (bbousellam@gmail.com)*

Purpose

The purpose of this case is to describe the clinical and paraclinical aspects of anophthalmos and microphthalmos, as well as treatment with ocular prosthesis, to highlight the importance of early management of these malformations.

Setting

This is a case about a visually impaired child with anophthalmia in the right eye and complex microphthalmia in the left, accompanied by psychomotor delay. Ophthalmological examination reveals the complete absence of the eyeball on the right and complex microphthalmia on the left.

Methods

The diagnosis is based on a cranio-orbital MRI revealing severe atrophy of the right eyeball and a hazy vitreous appearance on the left.

B-mode ocular ultrasound shows atrophy of the right optic nerve with an ocular remnant and, on the left, a normal optic nerve with an abnormal vitreous, no retinal detachment, and an unvisualized lens.

Results

Therapeutic and aesthetic intervention was recommended, involving orbital volume expansion with an oculist's placement of a plastic conformer, followed by a prosthetic eye for the right eye.

A consultation with a neuro pediatrician is also advised for monitoring psychomotor delay and screening for potential associated malformations that may suggest a malformative syndrome.

Conclusions

Anophthalmia and microphthalmia may be associated with genetic disorders or embryopathy, which justifies multidisciplinary management (ophthalmologist, pediatrician, geneticist, oculist) to identify syndromic disorders and genetic counseling to assess sibling risk.

Early management enables the cul-de-sacs to be reconstructed and the orbital cavity to be filled, which improves the orbit bone development.

Financial Disclosure of all authors

No financial Disclosure

Abstract #076

Diagnosing and monitoring the characteristics of Acanthamoeba keratitis using slitscanning and laser scanning in vivo confocal microscopy

K. Curro-Tafili*[a], E. Ghyczy[a], R. Van Nispen[a], F. Verbraak[a], R. De Vries[a]

[a] *AMSTERDAM UMC, Amsterdam, NETHERLANDS*

** Presenting author (k.curro@amsterdamumc.nl)*

Purpose

The purpose of this study was to identify reliable signs of Acanthamoeba keratitis (AK) using in vivo confocal microscopy (IVCM) and to provide a visual guideline to aid in the diagnosis and thereby to promote the use of this device.

Setting

Studies including various ophthalmology departments worldwide where IVCM was performed to visualize AK were reviewed. Images obtained from patients at the department of Ophthalmology in Amsterdam UMC, location VUmc were used for the guideline as well as visual representations of the signs found in the reviews.

Methods

A systematic review of the literature was conducted using Embase and PubMed, following the Preferred Reporting Items for systematic reviews and Meta-Analyses (PRISMA) guidelines.

Results

Twenty signs were found to be associated with AK. A lack of diagnostic standardization amongst the studies was found. Double wall cysts, trophozoites, signet rings, target signs and clusters of cysts were shown to be strong diagnostic indicators of AK. Cysts in clusters and single files were associated with the likelihood of corneal transplantation. Bright spots within the corneal epithelium demonstrated limited reliability as predictors of AK. Following treatment, cysts were reported to break down to hollow forms. A visual guideline for identifying and predicting AK using IVCM was created based on these results and our own clinical experience.

Conclusions

IVCM is a powerful diagnostic and prognostic tool for diagnosing and monitoring AK however users need to be aware of the different signs and patterns in order to avoid misdiagnosis. Signs which indicate poor prognosis can guide informed decisions regarding the necessity and optimal timing of surgical intervention.

Financial Disclosure of all authors

No financial support was recieved for this study.

Abstract #077

Assessing corneal tomographic changes in Fuchs Endothelial Corneal Dystrophy over One Year: Scheimpflug Versus Anterior Segment-Optical Coherence Tomography

O. Dorado Cortez*[a], S. Poinard[a], E. Crouzet[a], P. Gain[a], N. Koizumi[b], N. Okumura[b], G. Thuret[a]

[a] *Laboratory for Biology, Engineering and Imaging for Ophthalmology, BiiO, Faculty of Medicine, Health & Innovation Campus, Jean Monnet University, Saint Etienne, FRANCE ;* [b] *Department of Biomedical Engineering, Faculty of Life and Medical Sciences, Doshisha University, Kyoto, JAPAN*

** Presenting author (oliver.dc7@gmail.com)*

Purpose

Fuchs endothelial corneal dystrophy (FECD) is the most common primary corneal endothelial and one of the leading indications for corneal transplantation worldwide. Previously published articles demonstrated the capacity of Scheimpflug tomography to detect subclinical corneal edema and predict the FECD prognosis. To compare the capacity of anterior segment optical coherence tomography (AS-OCT) and Scheimpflug camera in detecting tomographic changes over one year in a cohort of patients with Fuchs endothelial corneal dystrophy (FECD).

Setting

We conducted a single-center prospective study at our University Hospital of Saint Etienne, France.

Methods

The study consisted of two identical visits spaced one year apart. At each visit, tomographic analyses were performed using Scheimpflug imaging (Pentacam HR, Oculus) and a swept-source AS-OCT (Casia SS-1000 Tomey). The resulting images were analyzed by three experienced independent observers. The main outcome was the agreement between the two devices for detecting subclinical corneal edema, as assessed using the inter-device reliability measured by Cohen's kappa coefficient. The criteria for subclinical edema were presence of irregular isopachs, displacement of the thinnest point, and presence of posterior surface depression.

Results

One hundred and four patients (160 eyes) were initially included in the study. Ninety patients were reviewed after one year. In total, we analyzed 129 eyes of 88 patients with good quality images for both devices. The overall agreement between the two devices to detect subclinical edema was good but the performance was significantly different for two parameters (thinnest point displacement and posterior depression). The inter-device reliability was 0.84 for loss of parallel isopachs, 0.55 for the displacement of the thinnest point, and 0.40 for the focal posterior corneal surface depression.

Conclusions

Corneal tomographic features of FECD can be easily quantified in clinical routine and clinical research by AS-OCT and Scheimpflug imaging but both are not fully interchangeable. Longitudinal follow-up should be done always with the same device. Neither appears to be more sensitive than the other for detecting minimal changes over 12 months.

Financial Disclosure of all authors

None

Abstract #078

'The Barcode Sign' of corneal OCT

F. Elzawahry*[a], H. Dua[a], D. Said[a], BK. Yildiz[a]

[a] *QUEENS MEDICAL CENTER, Nottingham, UNITED KINGDOM*

** Presenting author (farida.zawahry6@gmail.com)*

Purpose

To investigate the imaging capabilities of anterior segment optical coherence tomography (AS OCT) relying on its capabilities in delineating interfaces of different refractive indices in vascularized corneas. Reporting a clinical sign, seen on corneal OCT images, which is consistently present in relation to corneal vascularization which cannot be identified with routine slit lamp biomicroscopy and/or histology.

Setting

The study was conducted at Nottingham university hospital in a clinical setting.

Methods

Five patients (eyes) with corneal vascularization following different aetiologies (vascularization secondary to infectious keratitis, limbal stem cell deficiency (LSCD) and interstitial keratitis) were
examined clinically by slit lamp examination and by OCT as part of their assessment. The infectious keratitis cases and the interstitial keratitis case were in the healing stage after intensive
antibiotic and topical steroid treatment respectively. The LSCD case was two years post chemical injury. All scans were carried out with the scanning beam passing through the center of the infiltration and at a specific meridian. Examination was carried out by the same
operator.

Results

Each major vascular trunk (400 µ -1200 µ), both afferent and efferent, with an active circulation obstructed the passage of light completely. A dark shadow, starting from the depth of location of the vessels and extending the entire thickness of the cornea posterior to the location, was seen as a straight line on the OCT scan. In eyes with extensive vascularization with multiple vessels, several vertical lines of the shadows cast were visible in a single scan, giving it the appearance of a bar code, hence the descriptor, the 'bar code sign' is proposed for this appearance.

Conclusions

AS OCT imaging provides a range of parameters that can be used to assess corneal vascularization and identifies active vessles objectively which are often limited by slit-lamp biomicroscopy and/or histology capabilities.

Financial Disclosure of all authors

None of the authors have any competing/financial interests to declare in relation to the content of this paper.

Abstract #079

Development of quasi-hyperspectral imaging of a selected region of interest (ROI) for ophthalmology

Y. Feng*[a], J. Thomas[a], S. Poinard[a], S. Residori[b], U. Bortolozzo[b], P. Gain[c], G. Thuret[a]

[a] *Laboratory of Biology, Engineering and Imaging for Ophthalmology (BiiO), Faculty of Medicine, Health Innovation campus, Jean Monnet University, Saint-Etienne, FRANCE ;* [b] *HOASYS SAS, 120 route des Macarons, Valbonne, FRANCE ;* [c] *Ophthalmology department, University Hospital, Saint-Etienne, FRANCE*

** Presenting author (yan.feng@univ-st-etienne.fr)*

Purpose

Hyperspectral imaging combines spectroscopy with imaging capability and collects information from multiple spectral bands. In medicine, it offers new diagnostic possibility and has been for instance applied for oximetry of the retina. Taking advantage of high spatial and spectral resolution of the hyperspectral imaging technique, we developed a prototype of spectral measurements and analysis of a region of interest (ROI) instead of a unique measurement of each pixel which is time consuming and requires considerable computing power. This prototype is to analyze *ex vivo* human corneas and its applications will be extended to broadband spectral measurements for various eye diseases.

Setting

Experiments were conducted at the BiiO laboratory (University of Saint-Etienne). The prototype was a joint development with the startup HOASYS that patented the use of a digital light processing (DLP) component to select a ROI and project it onto a spectrometer to obtain a very rapid analysis of the ROI.

Methods

In our prototype, a digital micromirror device (DMD) based on the DLP technique is coupled with two CMOS sensors. The main camera selects the ROI over the entire object. The control camera shows the ROI only. By tilting micro-mirrors, the DMD works in two channels for control and analysis. A spectrometer implements the spectral measurement and analysis of the ROI. A graphical user interface programmed in Python allows selecting the ROI parameters, controlling the cameras and driving the DMD. The prototype was assessed on a colour transmission calibration slide and on a human cornea stained with 3 dyes.

Results

A field of view of 14mm in diameter was applied to fit the dimension of a human cornea. Four ROIs were selected on both the colour test slide and the cornea. The spectra detected by the analysis channel of our quasi-hyperspectral imaging system fitted with the calibration spectra of the four areas provided by Edmund Optics. The spectra of the stained areas of the cornea shared a consistent trend with the calibration spectra.

Conclusions

Our quasi-hyperspectral imaging system acts as an optical compressor, only extracting and analyzing the essential data collected from the ROI. The preliminary results validated our approach, with which a ROI can be selected through the control channel and the ROI data can be transferred to the analysis channel. The applications can be extended to the spectral analysis to anterior segments of the human eye as well as the broadband spectral measurement for different types of parameters. With huge potential applications in ophthalmology, both clinicians and researchers will benefit from the hyperspectral imaging for early diagnosis of various eye diseases.

Financial Disclosure of all authors

BPI France, i-Lab innovation program, 22nd edition, project HYPER-EYE

Abstract #080

Intradevice repeatability and interdevice comparison of two specular microscopy devices in a real-life setting: Tomey EM-4000 and Nidek CEM-530

I. Guber*[a]

[a] *UNIVERSITY OF GENEVA, Stettfurt, SWITZERLAND*

** Presenting author (ivo_guber@hotmail.com)*

Purpose

The purpose of this study was to compare two commercially available specular microscopes (Tomey EM-4000 and Nidek CEM-530) in a real-life clinical setting in terms of intra- and inter-device variability.

Setting

The study was conducted on all patients seen in a clinical practice specializing in anterior segment pathologies, regardless of the purpose of their visit.

Methods

112 eyes of 56 patients (age 23 - 85 years old) were included in the study. Each eye was measured 3 times with each device (for a total of 6 measurements) and results of central corneal thickness (CCT) and corneal endothelial cell density (ECD) were recorded. The results were then evaluated with the D'Agostino-Pearson normality test and compared with a Wilcoxon-Signed Rank test, t-test, ANOVA or Mann-Whitney test for intra- and inter-device variability.

Results

Both specular microscopes produced very reliable reproducible intra-device results: the Tomey EM-4000 measured an ECD of 2390±49.57 cells/mm^2 (mean ±standard error of mean); the range was 799 - 3010 cells/mm^2). The determined CCT was 546±5.104 µm (mean±standard error of mean [SEM]); the range was 425 - 615 µm. The measurements with the Nidek CEM-530 revealed an ECD of 2417±0.09 cells/mm^2 (mean±SEM); the range was 505 - 3461 cells/mm^2 (mean±SEM). The mean CCT detected was 546.3±4.937 µm (mean±SEM) ; the range was 431 - 621 µm. The inter-device differences were statistically significant for both parameters ECD ($p=0.0175$) and for CCT ($p=0.0125$) ($p<0.05$).

Conclusions

The Nidek CEM-530 and the Tomey EM-4000 both produced reliable and reproducible results in terms of ECD and CCT. The absolute measurements were statistically significant different for CCT and ECD for both devices; the Nidek produces slightly higher values.

Financial Disclosure of all authors

none

Abstract #081

Detection and classification of corneal pathologies on tomography using a deep learning approach

L. Hartmann*[a], A. Wolf[a], C. Wertheimer[a]

[a] *UNIVERSITY OF ULM, Ulm, GERMANY*

** Presenting author (Lennart.Hartmann@uniklinik-ulm.de)*

Purpose

Corneal tomography is a standard imaging modality for the assessment of corneal pathologies, but can sometimes be difficult for non-specialist ophthalmologists to interpret. Convolutional neural networks as a means of deep learning are used in many clinical areas due to their ability to extract information from multidimensional data sets, especially images. The present retrospective, monocentric study was conducted to assess the use of a convolutional neural network in the detection and classification of corneal pathologies on tomography.

Setting

This is a retrospective monocentric study at a tertiary university-based clinical centre.

Methods

After a strict quality control, 13567 tomography images (from OCULUS Pentacam) were included. Raw data as well as anterior curvature and elevation data were exported. The raw data was then displayed using a self-developed non-linear heat map. Two corneal specialists used a labelling tool for annotating into the following categories: Normal, regular astigmatism, irregular astigmatism, keratoconus, other ectasia, refractive surgery, pterygium and error. After the labelling process, the dataset was divided into a training set, a validation set and a test set.

Results

The training and the validation sets were used to train the network. Accuracy of the detection and classification within the test set was then measured. The accuracy of detection and classification of corneal pathologies by the neural network was 87%. This was accomplished by a combination of a learning rate of 0.001, a batch size of 16 and 500 epochs.

Conclusions

Here we show that training a convolutional neural network with images may help clinicians to detect and classify different corneal pathologies.

Financial Disclosure of all authors

Lennart M. Hartmann: None

Armin Wolf: Armin Wolf received research grants and study fees from Allergan, Boehringer Ingelheim, Bayer, Alimera, Novartis, Oertli and Roche and consulting honoraria and travel fees from Alimera, Allergan, Bayer, Boehringer Ingelheim, Novartis, Oertli, Roche and Zeiss. All of these are not connected to this study.

Christian M. Wertheimer: None

Abstract #082

Role of Anterior Segment OCT (ASOCT) in Breaks and Detachments of the Descemet's membrane

P. Jain[a], A. Hariani*[a], I. Gupta[a], G. Reddy[a], N. Trivedi[a], A. Mehta[a]

[a] *GURU NANAK EYE CENTRE, Delhi, INDIA*

** Presenting author (avanihariani@gmail.com)*

Purpose

To understand the role of anterior segment optical coherent tomography (ASOCT) in management of patients with Descemet membrane (DM) breaks and detachments.

Setting

This is a retrospective review of the role of ASOCT in identifying and managing patients with DM breaks and detachments in various case scenarios.

Methods

This is a retrospective review of the role of ASOCT in identifying and managing patients with DM breaks and detachments in various case scenarios.

Results

We present a myriad of cases such as ASOCT guided management of spontaneous Descemet membrane detachment after an uneventful cataract surgery, Acute Hydrops in advanced keratoconus managed using venting incisions and intracameral injection of C3F8 gas, ASOCT guided compression sutures in an attempt to rescue a patient with non-resolving hydrops post Pellucid corneal marginal degeneration, Intraoperative sudden rupture of the cornea managed with ASOCT guided compression sutures and cyanoacrylate glue in a case of Brittle cornea syndrome and role of ASOCT in various lamellar surgeries.

Conclusions

Though Microscope integrated OCT (I - OCT) is the talk of the town, not many places in a developing country like India have the privilege to reap the benefits of this technology. We conclude that the time tested ASOCT is at par with the newer I OCT in management of complex cases of breaks and detachments of Descemet's membrane.

Financial Disclosure of all authors

None

Abstract #083

A RARE CASE OF BILATERAL PROGRESSIVE IDIOPATHIC ANNULAR LIPID KERATOPATHY

I. Ludovico*[a], C. Barão[a], N. Rodrigues Alves[a], B. Cunha[a], N. Marques[a], C. Batalha[a]

[a] *Centro Hospitalar e Universitário de Lisboa Central, Lisbon, PORTUGAL*

** Presenting author (ines.ludovico91@gmail.com)*

Purpose

Our purpose is to report a case of a patient referred to our Ophthalmology Department with idiopathic lipid keratopathy with symmetrical bilateral annular corneal lipid infiltration and describe examination findings performed at our center.

Setting

Centro Hospitalar e Universitário de Lisboa Central, Lisbon, Portugal

Report of case

A 24-year old male with no relevant past history of trauma or systemic disease presented at our tertiary center with complaints of a progressive whitish centripetal opacification of peripheral cornea, bilaterally. Best corrected visual acuity was of 20/20 on both eyes. Biomicroscopy and Anterior Segment Photography taken at the time of presentation revealed annular lipid infiltration in the medium and deep stroma, paracentrally and progressing in a crescent fashion to form a lipid infiltration ring in both eyes. The central cornea area of about 7mm showed no infiltration, thus sparring the visual axis and preserving visual acuity. There was no anterior chamber reaction and intraocular pressure as well as fundoscopic examination were unremarkable. Laboratory determination of the blood lipidogram revealed to be normal. PENTACAM Tomography was unremarkable. Anterior segment swept-source optical coherence tomography (AS-OCT) ANTERION depicted hyper-reflective stromal lesions. The patient is being monitored at our tertiary center for progression.

Conclusion/Take home message

Idiopathic lipid keratopathy is a challenging disease of unknown etiology, based on the presence of lipid deposits in the cornea without preceding vascularization or inflammatory process underneath, accompanied by absence of serum lipid elevation. Lipids might accumulate due to excessive lipid production or deficient lipid metabolization, in a process similar to arcus senilis. It is usually a bilateral condition, and due to its slow progression, visual acuity can remain good for years with very slow deterioration. However, in more advanced disease, vision impairment can occur and a penetrating keratoplasty might be necessary.

Abstract #084

Fibrillar Layer Positive Eyes with Fuchs Endothelial Corneal Dystrophy Demonstrate Scheimpflug Tomography Features of Corneal Edema

M. Mestanoglu*[a], A. Howaldt[a], F. Bock[a], B. Bachmann[a], C. Cursiefen[a], M. Matthaei[a]

[a] *UNIVERSITY HOSPITAL OF COLOGNE, Cologne, GERMANY*

** Presenting author (mert.mestanoglu@uk-koeln.de)*

Purpose

Subendothelial collagen deposits in the central cornea named fibrillar layer (FL) are found in roughly 80% of advanced Fuchs endothelial corneal dystrophy (FECD) eyes. However, the clinical relevance of these Descemet membrane alterations is yet unclear. The purpose of this study was to investigate whether the presence and dimensions of the FL correlate with the Scheimpflug tomography features of corneal edema in FECD.

Setting

University Hospital Cologne, Centre for Ophthalmology. Cologne, Germany

Methods

FECD eyes undergoing DMEK or triple DMEK surgery and with high quality preoperative Scheimpflug imaging were included in this retrospective study. Corneal densitometry, pachymetry and posterior corneal surface elevation maps were exported as an image. FL status was determined through corneal densitometry images. FL areas were segmented, and caliper diameters were measured. The three tomographic features of corneal edema (loss of parallel isopachs, displacement of the thinnest point of cornea, focal area of posterior corneal surface depression) were evaluated in the corresponding images and correlated with FL status and dimensions.

Results

A total of 306 patients with high quality preoperative Scheimpflug tomography data could be enrolled. 247 eyes (80.7%) were determined as FL positive, and 59 eyes (19.3%) were FL negative. In the majority of the FL positive eyes (88.6%), two or three of the three tomographic corneal edema parameters were present, whereas only in 13.4% of the FL negative eyes two or three parameters were present.

Conclusions

FL positive eyes demonstrate more of the Scheimpflug tomography features of corneal edema, suggesting that the presence of an FL may be a marker of more advanced FECD status. The diagnostic significance of the presence of FL in FECD warrants further research.

Financial Disclosure of all authors

German Research Foundation (FOR2240 to CC; CU 47/6-1, CU 47/9- 1, CU 47/12-1 to CC, MA 5110/5-1 to MMa), German Research Council Cologne Clinician Scientist Program (Project 413543196 to AH), FORTUNE Program University of Cologne (to MMa); EU COST BM1302 "Joining Forces in Corneal Regeneration" and EU COST ANIRIDIA (to CC, BB), EU Arrest Blindness (to CC), Studienstiftung des Deutschen Volkes (to MMe). Forschung für das Sehen e.V. (https://augenklinik.uk-koeln.de/zentrum/foerderverein-forschung-sehen/) (to MMa).

Abstract #085

DESCEMET DETACHMENT AFTER CATARACT SURGERY IN A PATIENT WITH PREDESCEMET DISTROPHY

D. Munck Sánchez*[a], L. Alcalde Blanco[a], M. Santana Castro[a], D. Burón Pérez[b], A. Iribarra Fermandois[a], MC. De Uña Iglesias[a]

[a] *HOSPITAL 12 DE OCTUBRE, Madrid, SPAIN ;* [b] *HOSPITAL DE LEÓN, Leon, SPAIN*

** Presenting author (dani.munck@gmail.com)*

Purpose

To present a clinical case of a postoperative complication and its solution illustrated with multimodal imaging (slit lamp, optical coherence tomography scan (OCT), Scheimpflug imaging and corneal tomography).

Setting

A 78-year-old male patient was referred to our centre due to persistent corneal edema after cataract surgery. He had undergone surgery two months before and the cornea continued to be decompensated, so referral was made to us for consideration of a corneal transplant.

Report of case

In his left eye the patient presented a 750 µm thick corneal edema measured at the corneal apex, and in his right eye a transparent cornea. In the slit lamp both eyes showed diffuse pleomorphic grey opacities in the posterior stroma. The OCT scan revealed a large Descemet Membrane (DM) detachment in the left eye with a brake adjacent to the corneal incision of the cataract surgery. In the right eye, a hyperreflective line was observed immediately anterior to the DM, corresponding to an undiagnosed pre-descemet dystrophy. Corneal tomography findings were consistent with the diagnosis of pre-descemet dystrophy.

To ensure reattachment of the DM, the patient was proposed anterior chamber tamponade with 20% Sulfur hexafluoride (SF6) gas. Prior to surgery, the patient received a laser iridotomy at the clinic to avoid postoperative pupillary block.

One month after surgery, the DM remained attached, cornea was transparent and best-corrected visual acuity had improved from 0.4 to 0.8 (decimal notation).

Conclusion/Take home message

SF6 gas at 20% concentration bubble in the anterior chamber should be considered as the first-line treatment of Descemet Detachment even in patients with Pre-descemet Dystrophy.

Abstract #086

Central cloudy dystrophy of François - a case report.

M. Nocoń-Bratek*[a], A. Agaś-Lange[a], A. Smędowski[a]

[a] *Gibinski's University Clinical Centre of Medical University of Silesia, Katowice, POLAND*

** Presenting author (marnoc@interia.pl)*

Purpose

Presenting the clinical case of a patient with central François corneal dystrophy (CCDF).

Setting

The examination was conducted at Gibinski's University Clinical Centre of Medical University of Silesia, Katowice, Poland.

Report of case

The patient was examined by slit lamp biomicroscopy followed by evaluation using in vivo confocal microscopy (HRT III, RCM, Heidelberg, Germany) and optical coherence tomography (3D SS OCT CASIA 2, Tomey, Germany). Slit lamp examination showed bilateral polygonal opacities of the cornea separated by an interlaced network of transparent lines. The changes were visualized in the central part of the cornea over the entire thickness of the stroma. Confocal microscopy described epithelium with normal architecture and subepithelial thickening of Bowman's membrane. Small hyperreflective hiperdensities were seen in the anterior and posterior layers of the stroma, along with sharpening of the outlines of keratocytes. Optical coherence tomography of the anterior segment of the eye revealed increased reflectivity within the central cornea with intense structures in layers of the stroma.

Conclusion/Take home message

CCDF is a rare corneal stromal dystrophy. The main manifestation is opacities in the central part of the cornea. The disorder is asymptomatic and not progressive. Expanding the diagnosis of changes with a detailed examination of the anterior segment of the eye, allows for accurate visualization of abnormalities of the stroma, which is important in the differentiation of corneal pathology.

Abstract #087

Unilateral Fuchs-like, sheetah-like, corneal endothelial dystrophy that leaves on washing

S. Poinard*[a], O. Dorado-Cortez[a], H. Vaitinadapoule[a], D. Onitiu[b], I. Harzallah[b], P. Gain[c], G. Thuret[c]

[a] *Laboratory Biology, engineering and imaging for Ophthalmology, Health Innovation Campus, Faculty of Medicine, University Jean Monnet, Saint-Etienne, FRANCE ;* [b] *Genetic dpt, University Hospital, Saint-Etienne, FRANCE ;* [c] *Ophthalmology dpt, University Hospital, Saint-Etienne, FRANCE*

** Presenting author (gilles.thuret@wanadoo.fr)*

Purpose

To present a case of unilateral corneal endothelial disease and its unusual evolution after phacoemulsification, with innovative retro-illumination images.

Setting

Ophthalmology department, University Hospital, Saint-Etienne, France

Report of case

A 60-year-old man had for many years presented with a strictly unilateral, non-progressive endothelial "anomaly" in an eye with moderate amblyopia of undetermined cause. The cornea was transparent under slit lamp and retroillumination (prototype of a far-red, high-resolution, glare-free retroilluminator), but showed innumerable endothelial guttae evenly distributed in the central 6 mm. Specular microscopy was unusual: endothelial cell density of 2700 cells/mm^2 with a black spot in front of almost every cell (cheetah-like dystrophy). OCT thickness mapping was normal. He underwent phacoemulsification for a dense and disabling corticonuclear cataract, despite amblyopia. At the end of the surgery, which was uneventful, almost all the endothelial guttae had disappeared. The cornea was oedematous on Day 1 but regained its transparency within 7 days. The guttae did not reappear, but were replaced by pigment deposits, which were also very regular and diminished over time. After 1 year, the ECD was 1400 cells/mm^2, the cornea transparent and of normal thickness. The patient did not have a triplet repeat in the TCF4 gene (involved in 70% of Fuchs dystrophies in Caucasians). We found only one similar case in the literature, with almost identical in vivo confocal microscopy images but bilateral and in a patient who had not undergone surgery (DOI: 10.1097/MD.0000000000000564). The regular arrangement of pseudodroplets on each cell and their disappearance on washing suggest that this is a membrane structure (macrovesicle?). Their origin remains unclear, as does that of the pigments and their regression over time.

Conclusion/Take home message

This exceptional corneal endothelial cheetah-like dystrophy illustrates the value of combining imaging methods to assess the endothelium prior to cataract surgery in complex cases. High-resolution retro-illumination enables objective monitoring of changes over time.

Abstract #088

Novel Ocular Surface Imaging System for standardized color photography: clinical evaluation

V. Romano*[a], S. Lukas Yani[b], M. Augustin[b], P. Ostheimer[c], M. Lenzhofer[d], H. Reitsamer[e], B. Steger[f]

[a] UNIVERSITY OF BRESCIA, Brescia, ITALY ; [b] OCCYO GmbH, Innsbruck, AUSTRIA ; [c] UMIT- Private Universität für Gesundheitswissenschaften und -technologie GmbH, Tirol, AUSTRIA ; [d] Department of Ophthalmology and Optometry, Paracelsus Medical University Salzburg/Salzburger Landeskliniken„ Salzburg, AUSTRIA ; [e] Department of Ophthalmology and Optometry, Paracelsus Medical University Salzburg/Salzburger Landeskliniken, Salzburg, AUSTRIA ; [f] Department of Ophthalmology, Medical University of Innsbruck, Innsbruck, AUSTRIA

** Presenting author (vito.romano@unibs.it)*

Purpose

To demonstrate the safety and feasibility of a standardized, high-resolution external eye photography system in an ophthalmic outpatient clinic. To compare the imaging performance to state of the art slit-lamp photography.

Setting

Public setting (University hospital)

Methods

In a prospective controlled clinical trial, a first-in-human prototype of a novel external eye photography system(Occyo GmbH, Innsbruck, Austria) was used to capture ocular surface images from patients with ocular surface diseases(OSD). Imaging performance was compared to slit-lamp photography using the IM-900 imaging module(Haag Streit). A series of three images each was recorded for all cases with both systems. Outcome parameters for safety were best-corrected visual acuity(BCVA) test and contrast sensitivity(CST); and for feasibility were imaging duration, image quality. Standardization and image quality parameters were analyzed in predetermined regions of interest(ROI).

Results

A total of 100 cases were enrolled. Imaged ocular surface pathologies included penetrating corneal grafts, pterygium, pinguecula, corneal foreign bodies, superficial punctate and microbial keratitis. Safety and clinical feasibility was confirmed. As for image quality and standardization, the prototype was capable of capturing high-resolution images of the entire visible ocular surface with significantly less gaze-dependent image decentration and lightness variability compared to slit-lamp photography; significantly more reproducible in image lightness; and independence of room light conditions compared to slit lamp images. Similarly, focus, dynamic range and hue were superior to slit lamp photography.

Conclusions

The tested external eye photography prototype was safe and superior to slit lamp photography in capturing standardized high-quality images for documentation of clinical features of OSD. The simplicity of use and speed of image acquisition makes it feasible for high-throughput clinical workflows.

Financial Disclosure of all authors

Occyo GmbH for all the authors

Abstract #089

Revisiting Fuchs endothelial corneal dystrophy clinical classification using innovative high-resolution, far-red, reflexion-free retroillumination

G. Thuret*[a], O. Dorado-Cortez[b], S. Poinard[b], A. Ain[b], H. Vaitinadapoule[b], MC. Trone[c], P. Gain[b]

[a] Laboratory Biology, engineering and imaging for Ophthalmology, Health Innovation Campus, Faculty of Medicine, University Jean Monnet, Saint-Priest En Jarez, FRANCE ; [b] Laboratory Biology, engineering and imaging for Ophthalmology, Health Innovation Campus, Faculty of Medicine, University Jean Monnet, Saint-Etienne, FRANCE ; [c] Ophthalmology department, clinical research unit, University Hospital, Saint-Etienne, FRANCE

** Presenting author (gilles.thuret@univ-st-etienne.fr)*

Purpose

Fuchs' endothelial corneal dystrophy (FECD) is by far the most common corneal endothelial diseases in Western countries, and 50% of keratoplasties are carried out to treat endothelial diseases. New treatments are also emerging (Descemetorhexis only, rock-inhibitors, mTor-inhibitors, FGF-1). It will therefore soon be vital to be able to determine the stage of each patient in a simple and reliable way, in order to personalize treatment. Visual acuity, retroillumination, specular microscopy and thickness mapping are the 4 pillars of the examination. However, current retro-illumination images are of insufficient quality. Aim: to present the first series of FECD observed using new-generation retroillumination.

Setting

Ophthalmology department, University Hospital, and Laboratory Biology, Engineering and Imaging for Ophthalmology, Saint-Etienne, France. Clinical trial NCT05717543 RETRO-ILLUMI

Methods

We developed a prototype retroilluminator by modifying a slit lamp with the aim of obtaining high-resolution images, without parasitic reflection and without dazzling the patient. We then prospectively photographed 200 consecutive FECD patients. The images were then classified by 3 independent observers according to the modified Krachmer classification, which is the most widely used in the literature: it distinguishes patients according to the number of Guttae, the size of the area of confluent Guttae and the presence of oedema. We also classified patients according to new characteristics discovered thanks to these unprecedented images.

Results

The prototype produced clear, glare-free images in over 95% of cases. Persistent reflections were observed exclusively in pseudophakic patients. The high resolution made it possible to observe all the Guttae and to challenge Krachmer's grade 2 classification (more than 12 non-confluent drops), which included a major diversity of patients, some of whom had thousands of non-confluent Guttae. We also highlighted for the first time to our knowledge 2 new elements: the high frequency of radial alignment of Guttae, often over 360°, and the presence of Guttae in the periphery of the endothelium, suggesting that a cell migration anomaly is involved.

Conclusions

Innovative retroillumination images challenge Krachmer's classification by providing exceptional precision. They will make it easier to distinguish between sub-groups of patients with different visual repercussions and evolutionary profiles. Easy to use, this new device should help to improve both our understanding of FECD and its routine management.

Financial Disclosure of all authors

GT, AA, PG patented the retroilluminator. No conflict of interest for the other authors.

Abstract #090

Characterization of elementary lesions in Fuchs endothelial corneal dystrophy and an updated phenotypic classification.

H. Vaitinadapoule*[a], F. Mascarelli[a], Z. He[a], S. Poinard[a], P. Gain[a], G. Thuret[a], F. French Fuchs Study Group[a]

[a] *UNIVERSITY JEAN MONNET, Saint-Priest En Jarez, FRANCE*

** Presenting author (hanielle.vaitinadapoule@univ-st-etienne.fr)*

Purpose

Fuchs endothelial corneal dystrophy (FECD) is characterized by progressive changes in the Descemet membrane (DM). Its underlying pathophysiology is incompletely understood, involving specific genetic predispositions, abnormal response to oxidative stress, abnormal production of extracellular matrix and endothelial apoptosis. Nevertheless, despite these shared features, clinical progression displays considerable heterogeneity. The aim of this study is to describe and characterize the different lesions of DM in order to define different subgroups of FECD.

Setting

Basic experimentation conducted in our university laboratory Biology, engineering and imaging for Ophthalmology (BiiO, St-Etienne) on operative residues and approved by an ethics committee. The DM were obtained from the 23 French and Francophone centers participating in the French Fuchs Study Group.

Methods

DM measuring approximately 8 mm in diameter were retrieved by Descemetorhexis from patients undergoing endothelial keratoplasty. Mean (SD) age was 69.5 +/-9.4 years. We selected 300 intact DMs, allowing for analysis of the entire surface without loss of information. They were either stored in water to eliminate residual cells and facilitate surface analysis of the DM or fixed in 0.4% paraformaldehyde for analysis of residual cells. The DMs were flat-mounted on slides, dehydrated, and examined under bright-field and phase contrast optical microscopy, followed by image analysis and manual classification by 3 independent readers with review of discordant scores.

Results

Descemet excrescences (guttae, typical lesions of FECD) were consistently found on all DMs. Additional lesions such as curly structures (fibrillar structures surrounding the guttae), pigments, and peripheral radial striae were also characterized. All of these lesions exhibited different morphologies and distributions, leading to the classification of 6 phenotypic subgroups based on recurrent combinations. A predominant phenotype, constituting 49% of cases, was characterized by four specific lesions with centro-peripheral distribution: 1) well-defined round guttae of varying sizes, 2) curly structures covering the central guttae, 3) scattered pigments, and 4) a gradual decrease in lesions towards the periphery area.

Conclusions

This large-scale collection offers, for the first time, a precise description of all the histological lesions found in the DM at the stage of patients undergoing grafts in France. The novel classification highlights an unexpected diversity in the histology of FECD. Following this initial study, a prospective investigation will be conducted to establish correlations among elementary lesions, potential subgroups, clinical features, and genetic and proteomic profiles.

Financial Disclosure of all authors

None

Abstract #091

YAP (Yes-associated protein) reveals the biomechanical effects on human corneal endothelial cells of passive storage during eye banking

H. Vaitinadapoule*[a], O. Ben Moussa[a], C. Maurin[a], C. Perrache[a], P. Gain[a], G. Thuret[a], F. Mascarelli[b]

[a] *UNIVERSITY JEAN MONNET, Saint-Priest En Jarez, FRANCE ;* [b] *University Jean Monnet/INSERM UMR S1138, Saint-Priest En Jarez, FRANCE*

** Presenting author (hanielle.vaitinadapoule@univ-st-etienne.fr)*

Purpose

During eye banking, corneal quality depends mainly on the endothelial cell density (ECD) and on endothelial cells (EC) morphology. However, with current storage methods (organ culture (OC) or cold storage) corneas are not subjected to diverse mechanical cues, such as hydrokinetic pressure from the aqueous humor and intraocular pressure (IOP) in contrast to physiological conditions. We call these storage methods “passive”. YAP (Yes Associated Protein), a key transcriptional coactivator, is known for sensing diverse biomechanical cues and transducing them into biological outcomes. Aim: to determine the impact of biomechanical cues on YAP regulation in maintaining endothelial homeostasis during OC.

Setting

This research conducted in our university laboratory Biology, engineering and imaging for Ophthalmology (BiiO, St-Etienne) involves basic experimentation conducted on organ-cultured human corneas. Handling of donor tissues adhered to the tenets of the Declaration of Helsinki of 1975 and its 1983 revision in protecting donor confidentiality.

Methods

We used 3 types of corneas, retrieved using *in situ* corneoscleral excision: 1/ fresh corneas with post-mortem time <12 hours (n= 4) were processed immediately after excision without any storage; 2/ Organ cultured corneas, in CorneaMax (Eurobio, les Ulis, France), for less than 3 days (n= 10); 3/ OC corneas for 30 ± 9 days (mean±SD). Corneas were then fixed in pure methanol or in 0.4% paraformaldehyde. We investigated the expression and the subcellular localization of YAP in ECs using immunofluorescence on flat mounted-corneas and the antibodies listed below : Anti-YAP1 (ref: sc-101199) and Anti-phospho-YAP1, D9W2I (ser127, 13008S).

Results

We observed that the expression, the subcellular localization and phosphorylation of YAP varied with ECD and EC morphology which are two parameters that are modified during OC and may reflect cell adaptation to storage -induced biomechanical stress. The decrease in ECD and the morphological alteration of ECs lead to an increase in the nuclear translocation of YAP and the recruitment of its phosphorylated form at tight junctions, suggesting a pivotal role of YAP, a mechanosensitive protein, in corneal endothelial homeostasis.

Conclusions

Understanding the impact of these biophysical cues may enable the identification of biomechanics-associated molecules that support the homeostasis and functions of ECs. This advancement may facilitate enhanced corneal storage in eye banks and the development of new pharmacological therapies for endothelial deficiencies.

Financial Disclosure of all authors

None

Infections
&
Inflammation

Abstract #092

Unilateral endothelitis and progressed cataract after systemic COVID-19 infection.

M. Alexaki*[a], V. Liarakos[a]

[a] *AKTINA OPHTHALMOLOGY CENTER, Athens, GREECE*

** Presenting author (malexaki@hotmail.com)*

Purpose

To report a case of unilateral endothelitis and progressed white cataract after systemic COVID-19 infection and how we approached the case.

Setting

1AKTINA Center, Athens, Greece
2Naval and Veterans Hospital, Athens, Greece

Report of case

A 54-year-old male patient presented with reduced visual acuity in his right eye (OD) that deteriorated rapidly after systemic COVID-19 infection to the level of Light Perception. The patient reported preexisting unilateral cataract in the same eye that progressed rapidly after COVID-19 infection.
Furthermore, he mentioned some irritation in OD that developed during the COVID-19 infection. Slit lamp evaluation revealed numerous fine keratic precipitates dispersed almost evenly especially on the inferior half of the corneal endothelium together with very progressed white cataract only in OD. No clinical findings were evident in the other eye (OS). Fundus examination was impossible to be performed.
Specular microscopy revealed significant irregularities of the endothelial cells only in OD with reduced hexagonality, increased size, decreased density and irregular shape. Corneal pachymetry was symmetrical between the two eyes (505μm). The patient underwent standard phacoemulsification. Immediately after extracting the cataract, signs of hyalitis were already visible under the surgical microscope. The patient received a subconjunctival injection of betamethasone immediately after phacoemulsification, followed by Cyclopentolate and Atropine drops for 15 days. No severe inflammation was observed postoperatively. The condition of the corneal endothelium remained unaltered for 3 months after the operation.

Conclusion/Take home message

Unilateral endothelitis may develop after systemic COVID-19 infection. It can not be confirmed whether it is related to progressed ipsilateral cataract.

Abstract #093

A CHALLENGING JOURNEY THROUGH A PANOPHTALMIA SECONDARY TO A SEVERE FUNGAL KERATITIS WITH CORNEAL PERFORATION

B. Azarkan*[a], A. Akkoumi[b], Z. Hilali[b], H. Lazaar[b], S. Benchekroun[b], A. Amazouzi[b], L. Cherkaoui[b]

[a] *HOSPITAL OF SPECIALTIES, Rabat Harhoura, MOROCCO ;* [b] *Hsr, Rabat, MOROCCO*

** Presenting author (boutayna.azarkan@gmail.com)*

Purpose

Although less prevalence exists in the developed world, cases of fungal keratitis for almost half of all keratitis are occurring in the developing countries.

There are various challenges to the ophthalmologist, managing both inflamed and infected eye delayed presentation, long waiting time for culture positivity, limited availability antifungal drugs, a highly variable spectrum of anti-fungal drug sensitivity and a high recurrence rate following keratoplasty

This case report highlitghts the importance of dry eye assessment as a routine clinical management protocol, by the description of a resistant fungal keratitis, and discusses some surgery techniques to improve prognosis by earlier treatment.

Setting

To report the clinical, microbiological profile of a patient with fungal keratitis associated to a panophthalmia with dry eye disease. We received a 35yo working farmer for an acute visual acuity decline since 5days, with history of ocular trauma from vegetable object while cutting wood, and previous use of corticosteroids

Methods

The BCVA was at hand motion, the patient sustained a full-thickness, stellate corneal laceration. Slit-lamp examination showed severe dry conditon eyelid edema, meibomian gland dysfunction, BUT<5sec, Schirmer <10mm,a severe keratitis with descemetocoele at the apex of the original stellate, with feathery edges. In addition to conjunctival hyperemia and circumciliary congestion, on the cornea there was a deep purulent 7mm infiltrate with a large corneal abscess: epithelial fluorescein staining, stromal oedema around the ulcer defect with an important thinning involving >50% of the stroma.

Results

Culture confirmed fungal elements: Fusarium. Oral and topical voriconazole were initiated.

The control on the 2nd day revealed a perforation of half cornea with iris prolapse : an hemi-cornea missing at the inferior part, we could notice directly the iris prolapse into the conjunctiva. The AS-OCT revealed the complete disappearance of all cornea layers at the inferior half cornea. We choose first to perform a full-thickness conjunctival flap covering surgery combined with amniotic membrane transplantation, as a transitional surgery preventing the evisceration, to control the infection before a keratoplasty

Conclusions

Corneal perforation is a devastating complication resulting from numerous conditions that precipitate corneal melting. Regarding the diversity of fungal aetiology and the emergence of drug resistance in somespecies, proper identification using molecular methods and antifungal susceptibility testing could provide useful results.If not diagnosed and treated from the onset of the symptoms, it can lead to severe visual loss, or even blindness.

Financial Disclosure of all authors

no financial disclosure

Abstract #094

Bacterial keratitis: predisposing factors, clinical and microbiological review of 354 cases. An update from a French Academic Center.

C. Bertret*[a], J. Knoeri[a], L. Leveziel[a], T. Bourcier[b], L. Merabet[a], N. Bouheraoua[a], V. Borderie[a]

[a] *1520 HOSPITAL, Paris, FRANCE ;* [b] *New civil HOSPITAL, Strasbourg, FRANCE*

** Presenting author (bertret.clara@wanadoo.fr)*

Purpose

To report an epidemiological update of bacterial keratitis (BK) over 20 months in comparison with a previous study on the same period from 1998 to 1999.

Setting

In a tertiary ophthalmology center.

Methods

354 patients with BK documented by microbiological corneal scraping or resolutive on adapted antibiotics treatments from January 2020 to September 2021 were analyzed retrospectively.

Results

The positivity rate of corneal scrapings was 82.5% with 18.2% polybacterial. 175 (59.9%) bacteria were Gram-negative and 117 (40.1%) were Gram-positive. The most common bacteria were *Pseudomonas aeruginosa*(32.5%), *Moraxella spp*(18.1%), and *Staphylococcus aureus*(8.2%). Final visual acuity (LogMAR) was associated with age (r = 0.48; p=0.0001), infiltrate size (r = 0.32; p<0.0001), ocular surface disease (r = 0.13; p=0.03), contact lens wear (r= - 0.26; p<0.0001), and ocular trauma (r = 0.14; p=0.02).Compared with the previous period, the positivity rate of corneal scrapings and the proportion of Gram-negative bacteria, especially *Moraxella spp* increased.

Conclusions

The bacteria distribution was reversed with a majority of Gram-negative bacteria and a clear increase of *Moraxella spp.*

Financial Disclosure of all authors

none

Abstract #095

An alternative treatment for a patient with Sjogren's Syndrome and descemetocele: a case report

F. Biagini*[a], L. Di Cello[a], CE. Traverso[a], D. Venzano[a]

[a] *San Martino Hospital, Universitary Eye Clinic, Genova, ITALY*

** Presenting author (francesco.biagini1994@gmail.com)*

Purpose

To describe a case of a patient affected by Sjogren's Syndrome, severe dry eye disease, filamentary keratitis, and descemetocele.

Setting

A case report seen at San Martino Hospital Universitary Eye Clinic, Genoa, Italy.

Report of case

Patient was referred to our attention after reaching ER complaining severe pain, photophobia and epiphora on her left eye.

A descemetocele and filamentary keratitis were noticed on the same eye.

Anterior Segment OCT (AS-OCT) was performed to monitor the thickness and corneal structure of residual corneal tissue.

Minocycline 100 mg once daily and Vitamin C 1000 mg once daily were prescribed for oral therapy. On the left eye we applied external bandage with propylene stripped plasters (sterile strips) after application of topical sodium colistimethate, tetracycline and chloramphenicol combined ointment. We alerted our local eye bank to prepare a donor cornea.

Patient was evaluated daily on the first week, when the same bandage procedure was performed, and AS-OCT scans were gathered.

A week later, cornea was covered with therapeutic bandage contact lens, and follow-up visit were diluted.

Best corrected visual acuity (BCVA) went from counting fingers on the first visit to 20/63 at one month.

Corneal thickness went from 60 micrometers on the first day of visit to 470 micrometers at one month of treatment.

Cornea resulted in a restored shape, recovering from the bulging typical of descemetoceles.

Conclusion/Take home message

This case report illustrates an alternative non-invasive treatment possibility, especially to avoid surgery as first option.

The use of this kind of treatment could be useful in places where corneal tissues are not readily available or where a shortage is observed.

Abstract #096

Mini-incision for the treatment of an infected inclusion cyst of a conjunctival nevus.

E. Blavakis*[a], M. Kecik[a], G. Thumann[a], H. Massa[a]

[a] *Department of Ophthalmology, Geneva University Hospitals, Geneva, Switzerland, Geneva, SWITZERLAND*

** Presenting author (blavakism@gmail.com)*

Purpose

To describe for the first time the presentation and treatment of an infected inclusion cyst of a conjunctival nevus in a healthy 36-year-old patient.

Setting

Department of Ophthalmology, Geneva University Hospitals, Geneva, Switzerland.

Report of case

A healthy 36-year-old-man presented to the emergency department for a redness and pain in his left eye for 1 day. There was no history of ocular trauma or any other ocular disease. Visual acuity was 20/20 and intraocular pressure was 17 mmHg in both eyes. Slit lamp examination of the left eye revealed a conjunctival hyperemia nasally and a bulbar conjunctival nevus with 4 inclusion cysts, one of which was filled with a white material. A feeder vessel that was dilated and tortuous was also observed. Fluoresceine staining of the conjunctival epithelium was negative. The cornea was clear and there were no signs of any intraocular inflammation or infection. After topical anesthesia and disinfection with povidone-iodine 5%, a 1 mm length mini-incision of the white cyst was performed using a 30 G needle, followed by a bimanual drainage of a purulent material using 2 sterile eye-spears. A topical treatment with tobramycin 3mg/ml (Novartis, Switzerland) and moxifloxacin 5mg/ml (Alcon Laboratories, Switzerland) every 3 hours for a week was applied. A swab of the purulent drainage was performed and was positive for Gram+ flora. Patient reported a decrease in ocular pain and redness after one day of treatment. One week after the drainage of the cyst, the patient was asymptomatic and did not present any changes in his vision. On slit lamp examination, the 4 inclusion cysts were filled with a transparent liquid, there was not any vessel dilation and staining with fluorescein was negative.

Conclusion/Take home message

Conjunctival inclusion cysts can be isolated or part of a conjunctival nevus and they are occasionally treated for medical or cosmetic reasons by needling, surgical incision or argon layer photoablation but recurrence rate is high. Until now this condition was considered benign, nevertheless, herein we reported the case of an infected cyst which could in certain circumstances (like immunodeficiency or history of filtering surgery) have more severe consequences advocating for a more aggressive treatment. A possible hypothesis for the origin of the infection could be a micro-traumatism of the cyst while blinking. A thin wall of the cyst could also be a predisposing factor, as it is observed with thin and ischemic conjunctiva in cases of blebitis. A mini-incision on the slit-lamp combined with bimanual drainage and followed by topical antibiotic drops seems to be a safe and effective treatment.

Abstract #097

Ophthalmia nodosa: a periodic issue in the south of Spain

LM. Carles-Cerban*[a], M. Sola-Saenz[a], ME. Del-Castillo-Barroso[a], A. Perez-Aranda-Redondo[a]

[a] *HOSPITAL UNIVERSITARIO DE PUERTO REAL, Puerto Real, SPAIN*

** Presenting author (luis.carlescerban@gmail.com)*

Purpose

The purpose of this case report is to raise awareness of the importance of early diagnosis and treatment of ophthalmia nodosa, as well as to pose the question of whether climate change can be perceived in our daily ophthalmological practice.

Setting

Ophthalmia nodosa is an ocular inflammatory condition due to contact with insect hairs (typically caterpillar, tarantula) or vegetable material. In the south of Spain, the pine processionary caterpillar, whose lifecycle is reported to be changing, presents setae with intraocular migration capacity and a toxin of great urticating power.

Report of case

This is a two-case report of ophthalmia nodosa in Puerto Real Hospital population, in the south of Spain.
Firstly, we present the case of a 42-year-old man who suffered a trauma with a pine branch, resulting in pain in his right eye. In the immediate slit-lamp examination, we could observe hemorrhagic chemosis and more than ten caterpillar hairs in the cornea, affecting from epitelium to stroma. We took away as many hairs as possible and prescribed topical prednisolone with both oral and topical antibiotics. After several months of follow-up with his area ophthalmologist, he has been referred to our Ocular Surface Unit because of refractory foreign body sensation. Slit-lamp examination showed a complete immersion of the hairs in corneal stroma, but no intraocular penetration. Ciclosporine eye drops (1 mg/mL) has been added to his basal treatment, with close follow-up.
Our second patient is a 51-year-old man, with important ocular pain after blowing next to a chimney with pine leaves 24 hours earlier. Important cellulitis and hemorrhagic chemosis were perceived. In the slit-lamp examination, we found two caterpillar hairs, 90% embedded in corneal stroma and impossible to take away, apart from +2 Tyndall beam (funduscopy was not possible). We prescribed both topical and oral corticosteroids and antibiotics, apart from antihistaminic and cycloplegic treatment. After the first week of follow-up, both hairs had been completely embedded in stroma, without penetrating anterior chamber, and inflammation had decreased, with no Tyndall beam and a normal funduscopy.

Conclusion/Take home message

Caterpillar hair capacity of migrating tissue-through is the responsible of the time-dependent prognosis of ophthalmia nodosa, with a spectrum that includes from conjunctival chemosis to chorioretinopathy, endophthalmitis or papilitis. Therefore, in endemic areas, it is key to identify this entity and remove the hairs as soon as possible. However, environmental authorities of the south of Spain have reported a turn in this caterpillar's lifecycle, presumably due to climate change. Although the traditional larval period of this insect is February-April, they now are identified even in December, so maybe the calendar criterium is not useful for our differential diagnosis anymore. Therefore, we raise this question: how much could climate change affect our daily ophthalmological practice?

Abstract #098

Rare case of Bulbar Rhinosporidiosis with staphyloma and its management. Will the balloon burst !

AG. Dastidar*[a]

[a] *SYNERGY EYE CARE, New Delhi, INDIA*

** Presenting author (dr.aditighosh@gmail.com)*

Purpose

To describe surgical management of a rare case of bulbar conjunctival Rhinosporidial infection with large staphyloma and its 5 year follow up

Setting

Retrospective review of case record of 23 year old male patient with histopathology proven bulbar conjunctival Rhinosporidiosis and its succesful management with no recurence at 5 year follow up

Report of case

Rhinosporidiosis is a rare chronic granulomatous infection of mucous membrane by Rhinosporidium Seeberi. Most common site is nasal mucosa , 15 % ocular involvement , when the spores enter from aquatic habitat through a breached conjunctiva. We report a rare case of rhinosporidial infection ,involving the bulbar conjunctiva. A 23 year old male of agricultural background with pond water bathing history, presented to us with a slowly progressing balloon like growth in upper part of right eye with no visual disturbance. On examination both eye best corrected vision was 6/6 snellens, on slit lamp examination a sessile ,friable ,vascular bulbar -conjunctival lesion , studded with spherules (classical sign of rhinosporidiosis), overlying a large staphyloma (17 mm x 13 mm) was noted in right eye supero-temporal conjunctival quadrant, rest ocular examination was normal.Left eye was within normal limit and no nasopharyngeal involvement. Patient was managed with excision of conjunctival lesion in toto along with staphyloma repair and scleral patch graft.Histopathology of lesion confirmed the diagnosis. Followed by oral dapsone therapy for 6 months after ruling out G6PD deficiency. Eae-Nose-Throat department referral to rule out any nasopharyngeal rhinosporidial involvement.Scleral patch graft secured with fibrin glue along with sutures provide better tensile strength and tamponade. Scleral patch graft size (20mm x 17 mm) used is largest size used to the best of our knowledge. Post operative oral dapsone regimen after ruling out G6PD deficiency prevents recurrence by arrest of rhinosporidial sporozoite maturation and fibrosis. No recurrence and graft related complication noted in follow-up of 5 years.

Conclusion/Take home message

Conjunctival Rhinosporidial infection is easily missed clinicaly and present as scleral melt and globe perforation. We describe how to early detect clinically and successful management of rhinosporidiosis of bulbar conjunctiva associated staphyloma with largest scleral patch graft size use documented in peer reviewed journal, to the best of our knowledge. Early diagnosis and surgical intervention is key to avoid globe perforation.

Abstract #099

Mistakes in acanthamoeba keratitis diagnosis

G. Drozhzhyna*[a], O. Ivanova[a], K. Sereda[a]

[a] *THE FILATOV INSTITUTE OF EYE DISEASES AND TISSUE THERAPY, Odessa, UKRAINE*

** Presenting author (serp2002@ukr.net)*

Purpose

- to present a clinical case of acanthamoeba keratitis misdiagnosis in a patient who is contact lenses wearer

Setting

State Institution «The Filatov Institute of eye diseases and tissue therapy NAMS of Ukraine», Odessa, Ukraine

Report of case

Patient, 60 y.o, complained of photophobia, lacrimation, pain in the left eye. Patient used contact lenses for 15 years. 6 months ago, she took thermal baths and a week later noticed inflammation in her eye. For 2.5 months patient was treated for herpetic keratitis. Due to the lack of positive dynamics, she turned to a private medical center, where during bacterioscopic examination of conjunctival smear acanthamoeba trophozoites were detected. Patient was prescribed voriconazole, chlorhexidine, moxifloxacin, dexamethasone, dexpanthenol. Two-time cryoapplication of the affected area of the cornea was performed.. In 3 weeks after cooling down patient was diagnosed with central corneal ulcer with stromal thinning. Microscopy of a scraping from the eye revealed trophozoites of acanthamoeba. Upon admission to our hospital (6 months from the disease onset): conjunctiva is hyperemic, paracentral corneal ulcer 6.5 mm with heterogeneous infiltration, thinning in the center and a ring-shaped infiltrate. The anterior chamber is of medium depth, pupil is round, cataract. BCVA of the left eye 0.01. The results of microbiological examination of conjunctival cavity revealed epidermal staphylococcus and yeast-like fungi. Corneal confocal microscopy performed no pathognomonic changes for trophozoites or acanthomeba cysts. She was diagnosed with corneal ulcer of mixed etiology (bacterial-fungal, acanthomebic?) and treated with chlorhexidine 0.04%, fortified gentamicin and voriconazole, brolen. Left eye underwent penetrating keratoplasty with a diameter of 7.0/7.5 mm. Microbiological study of the corneal disc removed during surgery, conducted in two independent laboratories no fungal, gram-positive and gram-negative microorganisms, as well as microsporidium or acanthamoeba was founded. In the postoperative period, microflora growth was not detected in cultures from the conjunctiva. At discharge from the hospital, the graft was transparent and the surface was epithelialized, cataract. Intraocular pressure was normal. BCVA OS = 0.06. After 6 months phacoemulsification+IOL was performed. BCVA = 0,5.

Conclusion/Take home message

A significant number of acanthamoeba keratitis diagnoses are based on clinical signs and confocal microscopy data. Analysis of the results of conjunctival smear and scrapings from the cornea require an experienced examiner. Careful investigation of anamnesis, clinical symptoms as well as knowledge of the differential diagnostic of the disease and adequate assessment of the prescribed treatment effectiveness can help to make the correct diagnosis on time.

Abstract #100

Characterization of corneal infections by AS-OCT

F. Elzawahry*[a], H. Dua[a], D. Said[a], BK. Yildiz[a]

[a] *QUEENS MEDICAL CENTER, Nottingham, UNITED KINGDOM*

** Presenting author (farida.zawahry6@gmail.com)*

Purpose

In recent years, imaging modalities (including anterior segment optical coherence tomography (AS-OCT), In vivo confocal microscopy, and OCT angiography) have been developed and utilized to improve the speed and accuracy of diagnosing microbial keratitis (MK) however different devices have their specific acheivements and limitations.

In this study we aim to specifically highlight the importance of AS-OCT in the early diagnosis and follow up of MK patients of different etiologies by providing a primary descriptive analysis of the imaging modality and pathological findings, by corelating scans with slit lamp images of the same patient at different stages of corneal infections.

Setting

Outpatient clinics and eye casulaty. A Floor, Eye ENT Centre, Queens Medical Centre, Derby Road, Nottingham. NG7 2UH.

Methods

OCT of 45 patients who had infectious keratitis of different eatiologies in Nottingham university hospital between 2017-2023 were retrospectively reviewed. AS-OCT scanning was performed on initial presentation and at two regular follow-up appointments. The demographic features of the patients, type of infection, monitoring the depth of infiltrate, maximum width of infiltrate (where applicable), central corneal thickness, corneal layers (epithelium, superficial stroma, deep stroma, descemet's membrane, endothelium.) were assessed individually during three different visits. Vascularization pattern, and specific findings were also recorded.

Results

The mean age of the patients was 56.8 ± 19.5 (21-91) years, The most common infection type was viral (12 out of 45 (26.7%). A significant reduction was noticed in the infilterate thickness (p:0.001) although the width did not significantly change (p:0.74) The central corneal thickness also showed significant reduction between every visit (p:0.15,p: 0.001 consecutively) Epithelial defect was evident in all eyes at intial presentation but only 3 (6.7%) had persistent epithelial defect at healed stage of infection.

Conclusions

AS OCT has shown to be useful in the visualization of morphologic changes, but the sensitivity and specificity of AS OCT in the diagnosis and management of various corneal infections remain to be established.

Financial Disclosure of all authors

None of the authors have any competing/financial interests to declare in relation to the content of this paper.

Abstract #101

Targeted cancer drug´s corneal toxicity, a case report

P. García Carrero[a], MJ. Suarez Fernández[a], B. Sarmiento Torres[a], AI. Palacios Hipola[a], M. Santana Castro[a], L. Alcalde Blanco[a]

[a] *HOSPITAL UNIVERSITARIO 12 DE OCTUBRE, Madrid, SPAIN*

Purpose

Emphasize the role of the ophthalmologist in the follow-up of cancer patients undergoing chemotherapy treatment due to the risk of corneal complications, even corneal perforation.

Setting

Hospital 12 de Octubre

Report of case

A 79-year-old man with a history of colorectal cancer undergoing chemotherapy(5-fluorouracil) combined with cetuximab every 15 days and an episode of herpetic keratouveitis in the right eye (RE), was attended by the authors because of tearing, increased secretions, foreign body sensation and blurred vision since the herpetic episode. On examination of the right eye, a reduction in corrected visual acuity (VA) was observed, and in the slit lamp were observed signs of conjunctivitis in addition to a temporal peripheral area of corneal thinning with underlying endothelial folds, without infiltration nor edema and with fluor+ deposit but without uptake. Suspecting probable herpetic conjunctivitis and corneal thinning, treatment with intense hydration and acyclovir ointment 5 times a day was prescribed. Serial OCT were performed every week and progressive corneal thinning was perceived. Due to the risk of perforation, cetuximab was suspended, a contact lens was placed and amniotic membrane (AM) repositioning surgery was made, in addition to this, oral treatment with doxycycline 100 mg every 12 hours, prednisone 30 mg daily and vancyclovir 400 mg 5 times a day and topic aureomycin ointment was prescribed. During the follow-ups, a good post-surgical evolution was verified with a progressive increase in corneal thickness and neovascularization of the area. Currently, with adecuate corneal thickness and undergoing hydration treatment.

Conclusion/Take home message

Whenever a corneal deffect is observed in patients undergoing cetuximab cicles it´s important to do a close monitoring due to risk of progression even corneal perforation.

Abstract #102

Overcoming the Abyss: Effective Management of a Gram-Negative Microbial Corneal Ulcer with Melting and Impending Perforation in a Contact Lens Wearer.

I. Gardeli*[a], N. Ktistakis[a], R. Datseri[b], M. Orfanidou[c]

[a] GNA G. GENNIMATAS, OPHTHALMOLOGY CLINIC, CORNEA DEPARTMENT, Athens, GREECE ; [b] COMENIUS UNIVERSITY IN BRATISLAVA, OPHTHALMOLOGY DEPARTMENT, Bratislava, SLOVAKIA ; [c] G. GENNIMATAS MICROBIOLOGY DEPARTMENT, Athens, GREECE

** Presenting author (ioanna.g.gardeli@gmail.com)*

Purpose

To present the management of a compelling case of gram-negative microbial corneal ulcer, accompanied by corneal melting and impending perforation.

Setting

The patient was hospitalized and followed up at the ophthalmology clinic of G. Gennimatas hospital in Athens, Greece.

Report of case

A 39-year-old otherwise healthy female contact lens wearer without any previous ocular history was referred the emergency department with pain and redness in her left eye (OS) ongoing for 5 days. Slit lamp biomicroscopy of OS yielded conjunctival hyperemia with corneal melting. Anterior Chamber (AC) was deep, with significant inflammation (Tyndall +4), and a 3mm high hypopyon. All topical and systemic medications were discontinued for 6 hours as preparation for corneal scraping collection for culture. We switched treatment to Amikacin instilled every 15 minutes as a loading dose and then to hourly. Moreover, vancomycin was added. Owing to a strong suspicion of Pseudomonas being the offending agent intravenous (iv) Ceftazidime 2gr x3 was incorporated into the regimen. On a 5-day follow-up corneal melting subsided, the hypopyon had minimized, and the anterior chamber reaction had downgraded to +2. Corneal scraping cultures yielded Pseudomonas. Therefore, we kept the same regimen while closely monitoring the patient. Epithelization of the ulcer was initially evident 5 days later and the patient was discharged.

Conclusion/Take home message

Post-discharge, she was followed in outpatient, scheduled for Deep Anterior Lamellar Keratoplasty (DALK) since the endothelium and Descemet membrane were left intact. By these means we avoided a therapeutic penetrating keratoplasty and the risks that it entitles.

Abstract #103

Thalassemia and bilateral acute anterior uveitis

O. Ginoyan*[a], D. Simonyan[a], L. Voskanyan[a]

[a] *YSMU AFTER M.HERATSI, S.V. MALAYAN EC, Yerevan, ARMENIA*

** Presenting author (ofelya.ginoyan.b@mail.ru)*

Purpose

To report a case with Thalassemia , bilateral acute uveitis associated with papilledema a 13 -year-old girl

Setting

A 13-year-old female was admitted with complaints of low vision, pain,redness (OU VA 20/400, BCVA 20/200, IOP OU -N) to the Cornea-Uveitis department at the S V Malayan Eye Center in December 2023, Yerevan , Armenia.

Report of case

There are no reports about Thalassemia associated anterior uveitis.The patient was referred by a pediatrician /hematologist. Two months ago she was diagnosed Hb S beta thalassemia, which was accompanied by sudden vision loss. Two -month treatment. topical steroids eye drops q.i.d., cycloplegic eye drops t.i.d., no positive dynamics were observed. At the ocular examination, her BCVA 20/200 in both eyes. The patient was complaining of blurred vision in both eyes. On examination, she had granulomatous KPs on the lower surface of the cornea, 3+ cells in the anterior chamber, 2+ cells in the vitreous, optic disk hyperemia and swelling (obscuration of the nasal border of the disc.). All possible laboratory tests were performed to diagnose uveitis, none of them were positive. Visual field testing and optical coherence tomography were performed and Stage-1 Early Papilledema was diagnosed.At the same time, under the supervision of a hematologist, prescribed topical steroids eye drops ., cycloplegic eye drops every 2 hours, with multiple subtenon injections of Diprospan 1.0 (Betamethasone) . Positive dynamics were observed after two weeks, and an excellent result was recorded after one month: uveitis remission, the patient's BCVA was 20/20.Papilledema remained relatively stable(slight positive dynamics were observed in the layer of peripapillary nerve fibers).

Conclusion/Take home message

Our case report demonstrates a rare presentation of presumed Thalassemia assocaited bilateral acute anterior uveitis associated with papilledema in a 13 -year-old girl.The presence of papilledema was due to Thalassemia disease, and the presence of uveitis remains unexplained or can be not related .Considering our results, we aim to keep this case under dynamic control and report on further development, as conservative treatment (intravitreal injections, topical steroids, and cycloplegic drops) resulted in uveitis remission, but papilledema remained stable.

Abstract #104

Efficacy of intrastromal injection of antifungal drugs in recalcitrant fungal keratitis. A case series.

A. Grendele*[a], A. Moramarco[a], L. Fontana[a]

[a] *IRCCS AZIENDA OPSEDALIERO-UNIVERSITARIA DI BOLOGNA, Bologna, ITALY*

** Presenting author (grendele.arianna@gmail.com)*

Purpose

To illustrate the efficacy of combined intrastromal injection of voriconazole and amphotericin B for the management of recalcitrant fungal keratitis.

Setting

IRCCS Azienda Ospedaliero-Universitaria di Bologna

Report of case

Four patients with culture positive for fungal keratitis, not responding to topical therapy with natamycin 5% and voriconazole 1%, were treated with an additional intrastromal injection of voriconazole (50 ugm/0.1 mL) and amphotericin B (5 ugm/0.1 mL). The injections have been repeated at intervals of 72 hours since the resolution or the stabilization of the infection. In patient 1, we achieved a complete resolution of the infection. He was an 85-year-old woman with fungal keratitis unresponsive to voriconazole and moxifloxacin eye drops. We performed 4 cycles of intrastromal injections. At four months, the corrected visual acuity was 20/30. In the other three cases, intrastromal injections permitted the control of inflammation and the stabilization of infection to perform a therapeutic keratoplasty in election. Patient 2 was a 39-year-old man who developed fungal keratitis following accidental contact with soil; he was initially treated with fortified antibiotics, then with natamycin, voriconazole and moxifloxacin. Patient 3 was a 68-year-old man, and patient 4 was a 68-year-old man, both with a fungal keratitis post-plant injury unresponsive to topical voriconazole, natamycin and moxifloxacin. They received, respectively, 3, 6 and 2 cycles of intrastromal injections. Thus, the surgical approach was a penetrating keratoplasty (PK) performed two weeks from the last injection, a mushroom PK after three months and a DALK for a central leucoma after seventeen months. The corrected visual acuity was 20/100 at two months from the keratoplasty, 20/50 at twelve months, and 20/40 at two months. No recurrence of infection has been observed in any patient.

Conclusion/Take home message

Intrastromal injections of voriconazole and amphotericin B are useful as additional therapy to topical antifungal drugs in the treatment of recalcitrant fungal keratitis. They represent effective support to stabilize the infection, both resolving the keratitis completely or allowing to perform a keratoplasty in the election.

Abstract #105

Stings and cilia in the eye: a case series of rare ocular foreign body complications

I. Gupta*[a], P. Jain[a], A. Hariani[a], G. Reddy[a], A. Mehta[a]

[a] *GURU NANAK EYE CENTRE, Delhi, INDIA*

** Presenting author (gupta.isha1995@gmail.com)*

Purpose

To describe the presentation and management of a few rare intraocular foreign bodies encountered in the last year at our tertiary care centre.

Setting

Hospital setting

Report of case

Three patients presented to our tertiary care centre - two with corneal bee sting injury and one with intracameral cilium (eyelash) injury in last one year. The timing of the initial presentation, duration, and clinical features differed in each case leading to different course of treatment for each case. Patients with bee sting injury developed corneal decompensation whereas intracameral lash caused severe anterior chamber inflammation. Endothelial transplantation was done for the bee sting affected patients while lash removal was planned in the third patient.

Conclusion/Take home message

Both corneal bee sting injuries and intracameral cilia are relatively infrequent and associated with a myriad of visually debilitating ocular complications. Due to scarcity of the injury there are no established evidence-based guidelines for its management. An immediate and prompt surgical intervention to remove the offending agent as in our third case can curtail the toxic effects and improve visual outcomes, otherwise long-term complications in the form of corneal decompensation can occur.

Abstract #106

Pyrenocheata unguis-hominis-associated Fungal Keratitis: First Documentation via In-Vivo Confocal Microscopy

A. Guttmann*[a], P. Wintersteller[a], N. Woltsche[a], A. Heidinger[a], N. Medic[a], I. Boldin[a], J. Horwath-Winter[a]

[a] *MEDICAL UNIVERSITY GRAZ, Graz, AUSTRIA*

** Presenting author (andreas.guttmann@medunigraz.at)*

Purpose

Contact lens-associated keratitis represents a serious and vision-threatening condition. The causative spectrum is diverse, thus rapid and comprehensive diagnostic approaches are crucial. This report presents, following a literature review, the first case of contact lens-associated fungal keratitis in Austria caused by Pyrenocheata unguis-hominis (currently known as Neocucurbitaria unguis-hominis).

Setting

In this case report, we detail the treatment of a patient at the Department of Ophthalmology, Medical University of Graz, from December 2022 to November 2023, for a challenging case of fungal keratitis.

Report of case

A 48-year-old female patient presented in December 2022 at the Department of Ophthalmology, Medical University of Graz with severe photosensitivity and acute pain in the left eye. She had been wearing soft contact lenses for over 30 years, with the recent continuous use of Day&Night lenses for over 30 days. The initial Best Corrected Distance Visual Acuity (BCDVA) was 0.8 (Snellen decimal scale). Slit-lamp examination revealed a fluffy infiltrate approximately 1x1mm in size centrally. Corneal scraping was performed for direct staining (GRAM, PAS, LPCB), culture, PCR, and in vivo confocal microscopy (IVCM).

The direct staining predominantly showed GRAM+ cocci, later identified in culture as Streptococcus oralis. PAS staining revealed several fungal hyphae fragments. PCR confirmed the fungus as Pyrenocheata unguis-hominis. Documentation of fungal hyphae was achieved through IVCM.

The patient was treated with topical antibacterial and antifungal therapy, using Voriconazole 2% eye drops and Natamycin eye drops for several months. This treatment led to significant clinical improvement and scar formation. The final BCDVA in November 2023 was 0.9.

Conclusion/Take home message

Scientific data regarding the disease course and treatment of Pyrenocheata unguis-hominis associated keratitis is extremely limited. To date, there are only two published case reports from Spain and Belgium concerning this pathogen, typically causing skin and nail mycoses. In this case, the pathogen was also demonstrated using IVCM. The combined therapy with Voriconazole 2% and Natamycin eye drops resulted in a satisfactory outcome, emphasizing the importance of rapid diagnostics including IVCM.

Abstract #107

Use of Anterior Segment Optical Coherence Tomography in Corneal Burn Management: A Prospective Study

A. Hassairi*[a], R. Limaiem[a]

[a] *IHROT, Tunis, TUNISIA*

** Presenting author (hassairiasmah@gmail.com)*

Purpose

To assess the role of anterior segment optical coherence tomography (AS-OCT) for initial diagnosis and follow-up of treatment outcomes in cases of corneal burns.

Setting

Chemical burns resulting may causes significant damage to the ocular surface. Evaluating ocular burns can be difficult due to corneal opacity and angiogenesis. Anterior segment optical coherence tomography (AS-OCT) is a non-invasive tool that helps visualizing deep deep layers damage, complementing slit-lamp analysis.

Methods

We included 10 eyes with ocular burns. Anterior segment optical coherence tomography (AS-OCT) was performed during the initial visit and subsequently repeated throughout the treatment process. We registered 9 cases of chemical burns, with acids being the most common (6 patients), and one case of thermal burn.

Results

Clinical examination revealed four cases of corneal ulceration and four cases of corneal edema. We found corneal thickening in all cases with a mean pachymetry of 624.4 μm. Epithelial defect was noted in 6 subjects. The epithelium was hyper-reflective and thickened in 4 patients, associated with a rolled appearance in 3 cases and subepithelial bubbles in one case. Anterior stromal hyperreflectivity was found in 7 cases, and one case showed loss of stromal fiber homogeneity. In our series, two cases of Descemet's membrane detachment were observed.

Conclusions

AS-OCT is a very valuable tool in corneal burns, for early diagnosis and monitoring of treatment response. The early detection of Descemet's membrane detachment and corneal edema seems to be associated with the severity and location of corneal neovascularization.

Financial Disclosure of all authors

No financial disclosure

Abstract #108

Acanthamoeba keratitis: 8 cases treated with PHMB 0.08% in monotherapy (polihexanide).

A. Hervás*[a]

[a] *HOSPITAL LA FE, VALENCIA, Valencia, SPAIN*

** Presenting author (anheront@gmail.com)*

Purpose

To report topical PHMB (polihexanide) 0.08% (0.8 mg/ml) in monotherapy for Acanthamoeba Keratitis (AK) treatment.

Setting

The study was done at Universitary Hospital La Fe, Valencia. Spain.

Methods

We report 8 cases with AK.Principal inclusion criteria were clinical findings consistent with AK and positive Acanthamoeba PCR.During 6 months in every case,we treated all the patients with this regimen:1 drop every hour(day 1 to 5),1 drop every 2 hours(day 6 to 12), 1 drop every 3 hours(day 13 to 20),1 drop every 4 hours(day 21 to resolution).All cases were treated 1 drop a day after resolution completing 6 months from the start. The main outcome measure was clinical findings within 6 months, and secondary outcomes including best corrected visual acuity.

Results

8 cases of AK received PHMB 0.08% at the described regimen. The medical cure rate within 6 months was 86.6% with complete resolution in 6 cases. Secondary outcomes were median best-corrected visual acuity of 20/20. 2 of 8 patients required therapeutic penetrating keratoplasty. No drug-related adverse events occurred. Safety outcomes included adverse event rates.

Conclusions

PHMB 0.08% monotherapy may be effective for Acanthamoeba keratitis with medical cure rates of more than 85%

Financial Disclosure of all authors

No financial disclosure

Abstract #109

Treating Corneal Defect with Dehydrated Human Amniotic Membrane-Derived Material

D. Ho*[a], L. Holland[b], O. El-Haddad[b], D. Tole[b], K. Darcy[b]

[a] *Cheltenham General Hospital, Cheltenham, UNITED KINGDOM ;* [b] *Bristol Eye Hospital, Bristol, UNITED KINGDOM*

** Presenting author (derek.ho@doctors.org.uk)*

Purpose

The human amniotic membrane (hAM) contains anti-inflammatory properties. This study aimed to assess the effectiveness of dehydrated hAM-derived material (DHAMM) as a temporary patch for treating persistent corneal epithelial defects (PCED) of various aetiologies. The study was conducted at Bristol Eye Hospital, a UK tertiary corneal unit to evaluate DHAMM's potential and efficacy.

Setting

Location: corneal unit, Bristol Eye Hospital
Subjects: Patient with PCED

Methods

Single-site prospective clinical study on DHAMM application from August 2022 to June 2023.

Results

17 patients with PCED received DHAMM. Successful resolution of PCED was observed in 94.1% of cases (average healing time 27.1 days). Neurotrophic keratitis was the most common cause, which took longer to heal compared to non-neurotrophic ulcers. The average corneal epithelium healing rate was 1.47 ± 2.48 mm^2/day.

Conclusions

Our study demonstrated a high success rate in closing epithelial defects using DHAMM. Timely application of DHAMM may contribute to its efficacy. By taking clinical photographs before and after DHAMM application, we were able to objectively measure epithelial defect sizes and calculate their rates of healing over time, in mm^2/day.
The study highlights DHAMM as a valuable treatment option for managing PCED and preventing vision loss. Corneal re-epithelialisation rate represents an objective outcome measure for comparing between different treatment options for corneal epithelial defect.

Financial Disclosure of all authors

DKHH's position as a fixed-term Cornea Research Fellow at Bristol Eye Hospital was funded by NuVision Biotherapies.

Abstract #110

The menace of Traditional Eye Medicines (TEM) in a developing country

P. Jain[a], A. Hariani*[a], I. Gupta[a], G. Reddy[a], N. Trivedi[a], A. Mehta[a]

[a] *GURU NANAK EYE CENTRE, Delhi, INDIA*

** Presenting author (avanihariani@gmail.com)*

Purpose

To spread awareness about the damage caused to the ocular surface by the use of traditional eye medicine (TEM) in rural India.

Setting

A series of 3 cases of bilateral corneal blindness due to cornea melting and perforation. The common history these patients gave was of the use of topical traditional eye medicine (TEM) prescribed to them for symptoms of redness and watering by quacks in villages.

Methods

This is a retrospective analysis of 3 cases of bilateral corneal blindness caused due to the use of TEM who presented to a tertiary eye centre in India.

Results

All the patients required a therapeutic/ tectonic corneal transplant in view of long-standing corneal melts and a delay in presentation. 5 eyes underwent urgent penetrating keratoplasty to prevent further deterioration. Amniotic membrane transplant was done in 1 eye and was salvaged conservatively. 1 out of the 5 eyes that underwent penetrating keratoplasty further underwent Descemet stripping endothelial keratoplasty (DSAEK) with intra ocular lens (IOL) implantation. All the patients obtained ambulatory vision post-surgery.

Conclusions

There is need to spread awareness about the harmful effects of traditional medicines which might be considered 'innocuous' and are used to treat common eye conditions in rural India. Urgent and swift intervention in the form of tectonic keratoplasty and amniotic membrane transplantation is required to preserve the ocular surface and to prevent loss of the eye.

Financial Disclosure of all authors

None

Abstract #111

Enterococcus faecalis panophthalmitis: a devastating complication after DALK for macular corneal dystrophy in a patient operated for bilateral congenital cataract.

P. Jain[a], I. Gupta[a], A. Hariani[a], U. Sharma[a], C. Ogia[a], A. Soman[a], G. Reddy*[a]

[a] *GURU NANAK EYE CENTRE, DELHI., Delhi, INDIA*

** Presenting author (gahanreddya@gmail.com)*

Purpose

To report a case of Enterococcus faecalis panophthalmitis in a young male who underwent deep anterior lamellar keratoplasty (DALK) for macular corneal dystrophy with pseudophakia operated in childhood.

Setting

Deep anterior lamellar keratoplasty though considered safer and a relatively extraocular procedure as compared to penetrating keratoplasty is not free of its own set of complications.This case is unique as it highlights a grave complication due to an uncommon organism in case of an uneventful DALK surgery.

Report of case

A young male underwent DALK for macular corneal dystrophy. The same procedure was done few years back on the other eye with good gain of vision (BCVA 20/40). He was operated for congenital cataract in both eyes in childhood. With an uneventful first post-operative day, the patient presented with infiltrates and decreased graft clarity on day 2, ultrasound scans showed dense vitritis. Erring on the side of infection the patient was started on fortified topical and intravenous antibiotics. As the course of the disease worsened, the patient underwent a therapeutic corneal transplant with vitrectomy and intravitreal antibiotics to salvage the eye and the corneal button was sent for microbiological examination which revealed the presence of gram-positive Enterococcus faecalis sensitive to piperacillin. The patient was started on topical, intravenous and intravitreal piperacillin and showed signs of improvement symptomatically and on serial ultrasound B scans.

Conclusion/Take home message

The severity and the fulminant nature can be attributed to pre-existing breach in the anterior-posterior chamber due to a posterior capsulorhexis in this case. Post corneal transplant infections are a devastating complication and need urgent diagnosis and management to salvage the eye. Uncommon microorganisms are not that uncommon and a good microbiology lab could help save the patient from a devastating outcome of having to enucleate the eye.

None of the authors have any financial interests to declare.

Abstract #112

Accelerated high fluence photoactivated chromophore for infectious keratitis—corneal cross-linking (PACK-CXL) at the slit lamp: a pilot study

B. Knyazer*[a], F. Hafezi[b], A. Achiron[c]

[a] SOROKA UNIVERSITY MEDICAL CENTER, BEN-GURION UNIVERSITY OF THE NEGEV, Beer-Sheva, ISRAEL ; [b] ELZA Institute, University of Zurich, Zurich, SWITZERLAND ; [c] Sourasky Medical Center and Sackler School of Medicine, Tel Aviv University, Tel-Aviv, ISRAEL

* Presenting author (dr.knaizer@gmail.com)

Purpose

Photoactivated Chromophore for Infectious Keratitis-Corneal Cross-Linking (PACK-CXL) has garnered substantial interest among researchers and ophthalmologists due to its high promise as a potential treatment for infectious keratitis. The aim of this study is to evaluate the efficacy and safety of high-fluence PACK-CXL using 10.0 J/cm2 (30 mW/cm2, 5 min, and 33 s) at the slit lamp.

Setting

Patients admitted to the emergency room of the Department of Ophthalmology at Soroka University Medical Center, Beer-Sheva, Israel (SUMC), between March 2021 and February 2022. The study was approved by the Institutional Review Board (IRB) of the Ben-Gurion University of the Negev, Israel

Methods

This prospective interventional, nonrandomized cohort study included 20 eyes of 20 patients with bacterial, fungal, or mixed origin keratitis who underwent high fluence PACK-CXL treatment as an adjunct therapy to conventional antimicrobial therapy per American Academy of Ophthalmology treatment guidelines. The re-epithelization time was recorded, and corneal endothelial cell density was counted before and after treatment.

Results

The average re-epithelization time was 8.2 ± 2.8 days (range 3-14 days). After PACK-CXL treatment, eight patients (40%) were directly discharged, while the remained patients stayed in the hospital for an average of 5.6 ± 3.5 days. No eyes required keratoplasty. Endothelial cell density counts before and after the PACK-CXL procedure were 2,562.1 ± 397.3, and 2,564.8 ± 404.5 cells/mm2, respectively (p = 0.96).

Conclusions

Although it was not a randomized control trial, we conclude that high-fluence PACK-CXL as an adjuvant therapy is safe with no complications observed and efficient, as the time to re-epithelization was less than 14 days for all patients and no patients underwent tectonic keratoplasties. Further research is needed to compare it to the current standard of care.

Financial Disclosure of all authors

BK-None

FH holds a patent on a UV light source (PCT/CH 2012/000090) and is Chief Scientific and Medical Officer of EMAGine AG, which manufactures a cross-linking device.

AA-None

Abstract #113

A novel approach to Acanthamoeba keratitis treatment

LP. Lalou*[a], G. Kymionis[a], M. Katsimpras[a], K. Togka[a], V. Tsagkogiannis[a], D. Vakalopoulos[a], M. Chatzea[a]

[a] *ATHENS UNIVERSITY EYE CLINIC - NATIONAL KAPODISTRIAN UNIVERSITY OF ATHENS, Athens, GREECE*

** Presenting author (leda.lalou@hotmail.com)*

Purpose

To present an atypical case of Acanthamoeba keratitis (AK) in a contact lens (CL) wearer, initially misdiagnosed as CL corneal toxicity. Furthermore, to present the treatment results of a novel polyhexamethylene biguanide (PHMB) eye-drop formulation used as monotherapy.

Setting

Cornea Dept - Athens University Eye Clinic, G. Gennimatas

Report of case

The patient presented with worsening photophobia, ocular pain and decreased visual acuity in the right eye of one week duration. They had been on a regimen of topical antibiotics, corticosteroids and lubrication with an initial diagnosis of CL-induced corneal toxicity. Slit lamp examination demonstrated conjunctival injection, corneal epithelial microcysts, distributed extensively across the cornea. Fluoresceine staining was positive. The anterior chamber was quiet and intraocular pressure was within normal limits. Cultures were obtained and confocal microscopy was also performed which demonstrated double-walled cysts. A diagnosis of AK was established. As there is currently no AK established treatment, the patient consented to participate in a trial for an investigational high-dose PHMB formulation. The drug has been granted Orphan Dug Designation by the EMA and FDA for AK. Within two weeks of PHMB monotherapy, the patient's symptoms and visual acuity improved, along with gradual resolution of the epithelial microcysts. The patient is currently being followed up weekly and PHMB is gradually being tapered.

Conclusion/Take home message

A high degree of suspicion for AK is necessary in CL wearers that present with atypical symptoms and signs and infection should always be excluded though appropriate diagnostic procedures. Monotherapy with novel high-dose PHMB eye-drops has yielded positive results and could be a promising treatment pathway for AK.

Abstract #114

The Use of Subconjunctival Anti-VEGF Bevacizumab Injection for the Regression of Corneal Neovascularization and Opacity in Interstitial Keratitis

VSJ. Lee*[a], MSH. Law[b]

[a] *NATIONAL HEALTHCARE GROUP EYE INSTITUTE, TAN TOCK SENG HOSPITAL, SINGAPORE, Singapore, SINGAPORE ;* [b] *International Specialist Eye Centre, Malaysia, Kuala Lumpur, MALAYSIA*

** Presenting author (vanessaleesj@gmail.com)*

Purpose

To report on the clinical use of subconjunctival bevacizumab in patients with corneal neovascularization and opacity from interstitial keratitis

Setting

A 42-year-old gentleman presented with a 2-year history of gradual, progressive blurring of vision in his left eye.

Report of case

Clinical examination revealed central deep stromal neovascularisation of his left cornea, with lipid deposition and mild stromal edema. His presenting visual acuity was 6/15 in his left eye and 6/6 in his unaffected eye. Corneal sensation in his left eye was decreased. Serological blood tests for syphilis and tuberculosis were negative. A provisional diagnosis of viral interstitial keratitis was made. The patient was started on topical steroids and oral acyclovir 400mg 5 times a day. The patient was also given subconjunctival injection of Bevacizumab 2.5mg/0.1 mL under slit-lamp biomicroscopy on a 6-weekly basis. He had near-total improvement in visual acuity to 6/7.5, regression of cornea neovascularisation and improvement in cornea opacity after 4 injections. Anterior segment optical coherence tomography also revealed a decrease in the corneal opacity and corneal thickness.

Conclusion/Take home message

Bevacizumab is a humanized monoclonal antibody that targets vascular endothelial growth factor, and is licensed for the treatment of an array of tumors, including colorectal carcinoma, non-small-cell lung cancer and metastatic renal cell carcinoma. It is also widely used as an off-label option for the treatment of choroidal neovascularization caused by age related macular degeneration.

The use of Bevacizumab is a novel approach for the treatment of corneal neovascularisation and opacity from interstitial keratitis. We herein report a case of the use of subconjunctival injection of Anti-VEGF Monoclonal Antibody Bevacizumab for corneal neovascularisation in a patient with presumed viral interstitial keratitis.

Abstract #115

Early diagnosis and treatment of Acanthamoeba. What to do?

S. Lunardon*[a], P. Fogagnolo[a], S. Sonego[a], A. Strianese[a], LM. Rossetti[a]

[a] *San Paolo Hospital, University of Milan, Milan, ITALY*

** Presenting author (sofi.lunardon@gmail.com)*

Purpose

To strengthen the importance of early diagnosis of the rare, but severe infection Acanthamoeba. Early signs are mild and often misdiagnosed: clinical presentation may overlap with other infectious processes, like herpetic or fungal keratitis, and non-infectious processes, like contact lenses overwear and toxicity.
Treatment for epithelial stages of Acanthamoeba keratitis is evolving and still not standardized. The use as an orphan drug, like PHMB, requires authorization both from hospital and producer, delaying early treatment. It is mandatory to start effective treatments as soon as possible, in order to prevent spreading of infection in deeper layers and improving visual outcomes.

Setting

A 20-year-old patient presented to emergency department with worsening blurred vision, mild photophobia and foreign body sensation. She had an history of bi-weekly soft contact lens wear. These symptoms occurred 10 days before and partially remised with tobramycin-dexamethasone ophthalmic suspension. She reported a recent trip in Egypt.

Report of case

On presentation, Snellen Visual Acuity was 20/25 in both eyes. At slit lamp examination, she presented in both eyes mild conjunctival hyperemia, tarsal papillae and irregular corneal epithelium, characterized by diffuse limbus sparing vesicle-like epithelial deposits and overlying areas of positive and negative staining. Anterior-segment OCT image showed epithelial hyperplasia (right eye thickness: 120 micron, left eye thickness: 90 micron).
In vivo confocal microscopy revealed solitary and diffused round-ovoid hyperreflective bodies in both central and paracentral areas, apparently just on the epithelium as anterior stroma in the right eye was hardly explorable due to photophobia. Therefore, the diagnosis was bilateral Acanthamoeba epitheliopathy.
Subsequently, scraping with complete removal of affected epithelium was performed. Corneal smear was sent for PCR and culture.
Given the efficacy of antiseptics and corneal cross-linking (CXL), we decided to treat this patient with epi-off CXL (program for infection) and antiseptic, prescribing iodopovidone 5% QID and chlorhexidine QID. Neither CL to help epithelial healing nor corticosteroid treatment were used.
After one week, the in vivo confocal microscopy showed no residual cysts and PCR was negative for parasite infection. At slit lamp examination, epithelium presented mild corneal haze with punctate keratitis. Visual acuity was 20/20 in both eyes. Iodopovidone treatment was interrupted.
After 8 weeks, symptoms were remised, apart from mild photophobia, and there were no signs of recurrence. Ophthalmoscopic examination is conducted on a weekly basis and chlorhexidine treatment is ongoing.

Conclusion/Take home message

The management of epithelial stages in Acanthamoeba keratitis is developing. Confocal microscopy and diagnostic suspect, supported by a suggestive medical history, permit a quick diagnosis and a better prognosis. It consists of a non-invasive approach, while at the same time ensures a high sensitivity.
The accessibility of PHMB may not be prompt or widespread everywhere, potentially leading to delays in treatment initiation. Furthermore, the use of PHMB may lead to epithelial toxicity, raising questions about its suitability for long-term treatment in infections limited to epithelium.
It could be debated whether Acanthamoeba epitheliopathy might be effectively resolved only through epithelial removal, without requiring prolonged use of biguanide.
To conclude, the early stage of Acanthamoeba keratitis marks a critical window in clinical management: corneal debridement, CXL and antiseptics provide a valid therapeutic option to eradicate infection confined to epithelium.

Abstract #116

Increased incidence of adult gonococcal keratoconjunctivitis at two tertiary eye hospitals in Western Europe: clinical features, complications and antimicrobial susceptibility.

A. Milligan*[a], A. Randag[b], W. Lekkerkerk[c], H. Fifer[d]

[a] *Moorfields Eye Hospital, London, UNITED KINGDOM ;* [b] *Rotterdam Eye Hospital, Rotterdam, NETHERLANDS ;* [c] *Maasstad General Hospital, Rotterdam, NETHERLANDS ;* [d] *Blood Safety, Hepatitis, STI & HIV Division, UK Health Security Agency (UKHSA), London, UNITED KINGDOM*

** Presenting author (alice.milligan@nhs.net)*

Purpose

Gonorrhoea is on the rise. Between 2021 and 2022, sexual health services saw a 50% and a 33% increase in diagnoses respectively in England and the Netherlands. A concurrent rise in gonococcal keratoconjunctivitis (GKC) is a serious concern due to the potentially devastating visual complications, yet there is limited national epidemiology on GKC, including on antimicrobial susceptibility. This increase coincides with a major public health concern; *Neisseria gonorrhoeae* is evolving high levels of antimicrobial resistance, including to ceftriaxone, the last available option for empirical therapy.

Setting

This study was conducted in two tertiary referral centres; Moorfields Eye Hospital (MEH), London, UK and Rotterdam Eye Hospital, Rotterdam (REH), the Netherlands between 2017 and 2023.

Methods

This was a descriptive, retrospective case series. Inclusion criteria were laboratory confirmed gonococcal eye infection (via molecular methods and/or culture) in any adult (≥16 years) between 1st January 2017 and 31st July 2023. Conjunctival nucleic acid amplification test (NAAT) and culture samples were collected. Suspected *N. gonorrhoea* colonies were identified and antibiotic susceptibility testing performed. Both centres interpreted susceptibility using breakpoint criteria derived from European Committee on Antimicrobial Susceptibility Testing (EUCAST) guidance and in accordance with the manufacturer's specifications. Medical records were analysed for clinical presentation, treatment, complications and antibiotic susceptibility.

Results

In 2023, there is a sharp increase with 11 cases in the first seven months, compared to ≤3 cases per year between 2017-2022. Median age was 23.5 at MEH and 23 at REH. The population were majority male (76.2%). In approximately half of cases (52.4%), the clinical diagnosis was missed at first presentation, as non-gonococcal bacterial or viral infections were presumed. None of the isolates were resistant to ceftriaxone. Systemic treatment was provided in 94.7% of cases. Topical treatment varied widely. Complication rates were high (52.4%). Visual outcomes were good however, with 60% achieving 6/7.5 or better on Snellen chart.

Conclusions

There is a notable increase in the incidence of GKC cases in our centres in 2023, which may indicate a rise across Western Europe. GKC can result in vision loss if left untreated; emergency departments need heightened awareness to identify and treat cases at first presentation. Nationwide studies of the incidence, clinical features, risk factors, management, complications and antimicrobial resistance of adult patients with GKC have been proposed in both countries for 2024, including whole-genome sequencing of gonococcal isolates to determine if a particular strain or strains of *N. gonorrhoeae* with a preponderance for causing GKC may be currently circulating.

Financial Disclosure of all authors

Funding: The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests: None declared.

Abstract #117

移動式臨床検査顕微鏡とスマートフォンを使用した眼瞼炎患者のニキビダニの観察

Y. Ogata*[a], T. Ikuko[b], N. Kato[b]

[a] Ogata Ophthalmic Clinic, Tokyo, Japan, JAPAN ; [b] Minamiaoyama Eye Clinic, Tokyo, JAPAN

** Presenting author (yukaogata328@gmail.com)*

Purpose

ニキビダニは、まつげの根元、つまりマイボーム腺に生息することが知られており、慢性眼瞼炎の原因として認識されています。ニキビダニの観察には通常光学顕微鏡が必要ですが、眼科クリニックではそのような機器へのアクセスは限られています。このポータブル微生物観察装置を使用して、眼瞼炎の症例におけるニキビダニの観察に成功したので報告します。

Setting

スマートフォンで使用できるモバイル実験用顕微鏡「mil-kin®」（mil-kin、東京、https://www.mil-kin.com）は、細菌を観察できる新しいデバイスです。サンプルを固定したり染色したりすることなく、1000 倍の倍率で真菌やその他の微生物を観察できます。

Methods

症例は73歳女性、89歳女性、42歳男性。３人の患者は全員、眼表面や目の周囲に不快感を訴えて来院した。フィブリン様の沈着（カラレット）がまつ毛に観察され、43 歳の男性はまぶたの縁の皮膚が発赤して肥厚し、さらにまつ毛が抜け落ちていました。いずれの場合も、カラーレットが付着したまつ毛を除去し、携帯型微生物観察装置を用いて観察した。

Results

すべての症例のまつげにニキビダニが観察され、写真やビデオを撮影することができました。

Conclusions

光学顕微鏡を用いたニキビダニの観察は難しくありませんが、通常、高価な光学顕微鏡、モニター、記録用のカメラ装置が必要となります。mil-kin®を使えば、検体採取から診断までわずか数分で完了します。記録としてスマートフォンと同時に写真やショートムービーを撮影し、患者様に提示することも可能です。通常、彼らは驚き、治療に対してより協力的になります。スマートフォンと連携したこの顕微鏡は便利であり、ニキビダニによる眼瞼炎患者の検査や治療に役立つと考えています。

Financial Disclosure of all authors

著者には、宣言すべき利益相反はありません。

Abstract #118

Ocular Findings in Stevens-Johnson Syndrome Patients after Etanercept Treatment: A Retrospective Study of a Randomized Clinical Trial

LY. Pan*[a]

[a] *NEW TAIPEI MUNICIPAL TUCHENG HOSPITAL, Taoyuan City, TAIWAN, PROVINCE OF CHINA*

** Presenting author (jim123542001@gmail.com)*

Purpose

We aimed to compare the ocular findings in Steven-Johnson syndrome (SJS)/toxic epidermal necrolysis (TEN) patients treated with systemic etanercept or corticosteroids and correlate the disease severity and therapeutic effects with serum biomarkers.

Setting

Patients who were admitted for acute SJS/TEN were recruited and randomly assigned to receive either systemic etanercept or corticosteroids. Only patients who received an ophthalmic examination in the acute stage were included. It's a retrospective study using data from a randomized controlled clinical trial cohort.

Methods

We reviewed the eligible patients' ophthalmic examination results, medical and surgical treatment records, and serum granulysin and T-regulatory cell (Treg) levels during the acute and recovery stages.

Results

A total of 116 eyes were included in the study (58 eyes in each group), with the baseline characteristics showing no significant difference. After a mean follow-up of more than three years, the etanercept treatment group exhibited significantly lower chronic OSGS and better BCVA and Schirmer test values. The acute- and recovery-stage serum granulysin levels were positively correlated with the acute-stage Sotozono's grading score, and a negative correlation was found between the initial Treg level and chronic OSGS. Moreover, in the etanercept group, after treatment, the increase in Treg levels was positively correlated with the chronic OSGS

Conclusions

Compared with SJS/TEN patients treated with systemic corticosteroids, patients treated with etanercept had less severe chronic ocular manifestations, higher tear secretion, better BCVA, and no noticeable complications. The serum granulysin level may be an indicator of the severity of acute ocular involvement. Etanercept treatment preferentially upregulated Treg levels, and the increase in Tregs was proportional to the severity of chronic ocular sequelae. Our findings advocate etanercept treatment for acute SJS/TEN patients, especially patients with more severe ocular involvement.

Financial Disclosure of all authors

I have no financial disclosure

Abstract #119

The incidence of severe complications in acanthamoeba keratitis: qualitative and quantitativesystematic assessment

ML. Passaro*[a], M. Posarelli[b], FC. Avolio[a], C. Costagliola[c], V. Romano[d]

[a] Department of Neurosciences, Reproductive Sciences and Dentistry, University of Naples "Federico II", Naples, Italy, Napoli, ITALY ; [b] St. Paul Eye Unit, Royal Liverpool University Hospital, Liverpool, UNITED KINGDOM ; [c] Department of Neurosciences, Reproductive and Dentistry Sciences, University of Naples Federico II, Naples Italy, Napoli, ITALY ; [d] Department of Medical and Surgical Specialties, Radiological Sciences, and Public Health, Ophthalmology Clinic, University of Brescia,, Brescia, ITALY

** Presenting author (M.laura.passaro@gmail.com)*

Purpose

Acanthamoeba keratitis is a rare, sight-threating corneal infection. The disease is challenging to diagnose and treat, and the amoeba can rapidly encyst, persisting in the tissue and causing recurrences. Medical therapy is conventionally considered the first line treatment, but advanced cases could require more invasive treatments like “a chaud” corneal transplant. In this systematic review, we report the incidence of severe complications in patients affected by acanthamoeba keratitis.

Setting

Systematic literature review and meta-analysis

Methods

This systematic literature review and meta-analysis was performed according to the PRISMA guidelines and registered in PROSPERO. Literature searches were conducted in Medline and Scopus. Studies encompassing patients with a confirmed diagnosis of Acanthamoeba keratitis were included, irrespective of the administered medical, para-surgical, or surgical interventions, provided that an assessment of treatment outcomes was conducted. To ensure inclusivity, we did not impose restrictions on the follow-up duration. Outcomes were measured across various parameters, encompassing the incidence of keratoplasties, the incidence rate of perforation, the incidence rate of endophthalmitis, and the incidence rate of enucleation/evisceration.

Results

Of 439 reports screened, 166 met our inclusion criteria. The incidence rate of perforation or impending perforation was 2.01% (CI 1.67; 2.42). The incidence rate of endophthalmitis was 0.19 % (CI 0.1; 0.35), while the incidence of evisceration/enucleation was 0.95% (CI 0.72; 1.24). Corneal transplantation was required in 28.59% of the cases. Over 902 keratoplasties, 548 (60.75%) were penetrating keratoplasties, 41 (4.55%) anterior lamellar keratoplasty, and 313 (34.70%) not specified. Regarding the indication, 313 (34.7%) were therapeutic keratoplasties, 130 (14.41%) optical keratoplasties, and 459 (50.89%) not specified.

Conclusions

Incidence of severe complications was low, with 2.01% patients developing perforation, and less than 1% developing endophthalmitis or requiring evisceration/enucleation. According to our results, and considering the reported incidences of these complications in other infectious keratitis, AK patients have an overall low risk of developing perforation, endophthalmitis, and enucleation/evisceration. Nevertheless, data available in literature remain poor, and further randomized control trials are needed to confirm our findings.

Financial Disclosure of all authors

No Financial Disclosure

Abstract #120

A Case of Perforated Corneal Geographic Ulcer

K. Ramazanova*[a]

[a] *NATIONAL OPHTHALMOLOGY CENTER NAMED AFTER ACAD. ZARIFA ALIYEVA, Baku, AZERBAIJAN*

** Presenting author (khouraman@gmail.com)*

Purpose

To report a case of perforated geographic corneal ulcer that developed in a patient with Herpes Simplex Virus epithelial keratitis after topical steroid use and was managed with cyanoacrylate glue.

Setting

National Ophthalmology Center named after acad. Zarifa Aliyeva, Baku, Azerbaijan.

Report of case

A 51-year old male patient presented to our clinic with complaints of redness and decreased vision in his right eye for the last two weeks. The medical history was remarkable for herpetic dendritic keratitis. The patient used topical prednisolone acetate 1% to reduce redness of the eye, but due to deterioration of the vision he came to the clinic. On the examination, visual acuity in the right was CF at 1 meter. On slit-lamp examination of the right eye conjunctival hyperaemia, large stromal ulcer in a geographic shape with perforated areas and shallow anterior chamber (AC) were noted. The Seidel's test was positive. The left eye was within normal limits.

The patient refused any surgical intervention. As an emergency treatment was required, cyanoacrylate tissue adhesive (TA) with bandage contact lens (BCL) were attempted at the slit lamp under topical anesthesia. Topical steroids were discontinued. The patient received topical antibiotics, lubricants, cycloplegic eye drops and oral acyclovir. Two weeks later TA was dislodged from its place, for which the cornea was successfully re-glued. One month after TA application AC remained well formed. Unfortunately, the patient had not visited the clinic for the next 2 months. He came three months later with totally healed ulcer, stromal scar and corneal neovascularization.

Conclusion/Take home message

The present case shows the importance of distinguishing different forms of HSV keratitis for starting a proper treatment. In cases of HSV epithelial keratitis, caused by live virus, topical steroids are contraindicated and their use can lead to disastrous consequences. Although synthetic tissue adhesive is good option for the closure of impeding or small corneal perforations, we successfully used it to seal a large corneal thinning with perforation. Cyanoacrylate glues can be applied at slit-lamp or in operating room. They have some advantages: ease of application, minimal cost and reduced surgical time. However, it is necessary to consider toxic effects of cyanoacrylate glue, such as ocular surface inflammation and stromal neovascularization. To prevent or decrease these complications strict follow-up must be maintained.

Abstract #121

Topical Insulin Eye Drops in Infective Keratitis

D. Romano*[a], S. Tiew[a]

[a] *UNIVERSITY HOSPITALS OF LEICESTER NHS TRSUT, Leicester, UNITED KINGDOM*

** Presenting author (davide.romano.md@gmail.com)*

Purpose

To evaluate whether insulin eye drops may be useful in case of epithelial defects in infective keratitis.

Setting

Ophthalmology Department.
Leicester Royal Infirmary. University Hospitals of Leicester NHS Trust.
Leicester, UK

Methods

5 patients with culture proven infective keratitis and epithelial defect (ED) were recruited. The infections were: HSV-1 (n=1), Pseudomonas Aeruginosa (n=2), Acanthamoeba (n=1) and Stenotrophomonas maltophilia (n=1). Each patient was commenced on daily topical insulin at a concentration of 1 units/ml (Humulin S in Systane lubricant eye drops), 1 drop four times a day for 30 days. Evaluation of the ED was performed at slit-lamp at baseline, and week 1,2,3 and 4. Resolved ED was defined as no fluorescein staining present at slit-lamp examination at follow up.

Results

Complete healing of the ED occurred only in the case of previous HSV-1 keratitis. The patient was noted to not be using any other topical treatments other than insulin eye drops.
In the other 4 cases, the ED was still present at week 4, albeit reduced to 80% of the original size. We observed that in these 4 cases, the patients were still using topical steroids and/or topical antibiotics and/or topical polyhexanide.

Conclusions

Insulin eye drops may be helpful in cases of post-infective keratitis ED and non-concomitant use of any other drops, which may interfere or cause epithelial toxicity. A larger size sample is recommended for detailed analyses.

Financial Disclosure of all authors

None

Abstract #122

Watch out, 2024: monkeypox is still with us!

A. Saladrigas*[a], M. Caminal[a], S. Conversa[a], Z. Del Campo[a], Má. Gil[a], V. Lázaro-Rodríguez[a], N. Sabater[a]

[a] *HOSPITAL DE LA SANTA CREU I SANT PAU, Barcelona, SPAIN*

** Presenting author (asaladrigas@santpau.cat)*

Purpose

Vaccination against mpox became available in June 2022 and showed to be effective in preventing mpox disease. Due to the increasing herd immunity provided by vaccination there has been a substantial reduction in mpox cases during 2023, turning ocular mpox into an uncommon reason for consultation.

Setting

We report a case of an acute unilateral conjunctivitis as a first manifestation of monkeypox infection in an immunocompetent non-vaccinated patient at the beginning of 2024, in our hospital.

Report of case

A 35-year-old male attended to the eye emergencies presenting a five days history of eyelid swelling, red eye and ocular pain on his right eye. Slit lamp examination revealed chemosis, conjunctival hyperemia and tarsal conjunctival follicles without any systemic signs or symptoms. Conjunctival swabs were taken for Chlamydia trachomatis, Neisseria gonorrhoeae and other bacteria, which resulted negative. Dexamethasone-chloramphenicol ointment every 8 hours was prescribed until the next appointment 48 hours later. The patient returned with preseptal cellulitis, superior eyelid margin ulceration, mucopurulent discharge and worsening chemosis with clear fluo-negative cornea. On examination pustular lesions on supraciliary zone, arms and back were found.

Despite the swab results were negative for gonorrhea, chlamydia and other bacteria he was admitted to the hospital and empiric treatment was started. Meanwhile, conjunctival and pustular lesions swabs taken had a positive polymerase chain reaction test (PCR) for Orthopoxvirus (OPXV). Human Immunodeficiency Virus (HIV) screening was negative.

The patient had sex with men and a recent high-risk sexual encounter two weeks before. Anamnesis showed up a history of syphilis with multiple subsequent reinfections in the previous year.

Despite eye topical and oral treatment, there was a persistence of the eyelid margin ulceration, chemosis, a conjunctival erosion 360° and conjunctival adhesions, which were treated to avoid symblepharon. A superior epithelial corneal infiltrate with irregularities and defect showed up three days later, so oral tecovirimat and topical trifluridine 1% were added with rapid improvement of corneal disturbances.

Conclusion/Take home message

Ocular involvement can be first sign of mpox, starting as an acute unilateral conjunctivitis and leading to potentially sight-threatening complications. Mpox cases can be found nowadays outside Africa despite the wide and massive vaccination campaigns that have focused on at risk population groups. A thorough anamnesis and ocular and systemic examination might be the key to suspect the disease, request proper test and start the correct treatment that may reduce or even avoid sight-threatening sequelae.

Abstract #123

Complex conjunctival reconstruction with oral mucosal grafts in patient with recurrent conjunctival squamous cell carcinoma.

L. Salgueiro Tielas*[a], B. García Sandoval[a], J. Duque García[a], I. Jiménez-Alfaro Morote[a], JJ. San Román Llorens[a]

[a] *HOSPITAL UNIVERSITARIO FUNDACIÓN JIMÉNEZ DÍAZ, Madrid, SPAIN*

** Presenting author (lourdes.salgueiro@quironsalud.es)*

Purpose

The aim of this case report is to describe an interesting case in which two big sized oral mucosal grafts were needed for the reconstruction of a conjunctival defect caused by the excision of an aggressive recurrent conjunctival squamous cell carcinoma.

Setting

Tertiary referral hospital Fundación Jiménez Díaz, Madrid, Spain.

Report of case

An 83-year-old male with no significant ophthalmologic history, comes to the emergency room after the appearance of a conjunctival lesion on his left eye a month ago. The patient presented a visual acuity (VA) of 0.7 on the right eye and 0.9 on the left eye. Biomicroscopically (BMC), the lesion is described as an inferior temporal bulbar conjunctival neoplasm of 5.6 mm x 5.1 mm with a central leukoplakic area of 1.8 mm x 4.2 mm, associating important vascular appeal. UBM was performed where a well-defined rounded hypoechoic tumor with a 1mm cyst was visualized. In view of these findings, resection of the conjunctival lesion and anatomopathological analysis were performed.

The biopsy confirms that it is a moderately differentiated, infiltrating, keratinizing epidermoid carcinoma, with free margins. In the immunohistochemical study, expression of the squamous differentiation marker P-40, 40% proliferative activity and overexpression of P-53 were detected Squamous change was found in the conjunctival epithelium. Therefore, treatment with topical 5-FU was started.

A month and a half later, two new masses were visualized in the temporal margin of the tumor. Therefore, it was decided to perform a new surgery with resection of both masses with margin enlargement, double barrier with cryotherapy and MMC 0.02%. We used two big sized mucosa grafts from the inferior lip and one from the cheek mucosa for reconstruction of the conjunctival defect. Ten days after the procedure, treatment with topical Mitomycin C (MMC) 0.02% was started.

Currently, the patient is free of recurrences and has completed therapy with MMC 0.02% 6 months ago.

Conclusion/Take home message

Conjunctival squamous cell carcinoma is a relatively frequent tumor in ocular oncology consults and usually has a good prognosis. However, some cases are more aggressive and require more aggressive treatments that result in large residual conjunctival defects.

Oral mucosal grafting is a viable option for the reconstruction of the conjunctiva. Advantages include easy accessibility of grafts, enough size and surface even for repeated procedures and a high stability of the grafts. In this particular situation, we report a case in which this technique was a satisfactory option for the reconstruction of the conjunctiva, attempting a conservative approach with a good aesthetic and oncologic result.

(None of the authors have any financial disclosure to declare).

Abstract #124

GRAFT-VS-HOST DISSEASE CORNEAL MICROPERFORATION REPAIR USING CORNEAL LAMELLA AND FIBRIN GLUE

M. Santana Castro*[a], D. Munck Sánchez[a], P. García Carrero[a], L. Alcalde Blanco[a], MDC. De Uña Iglesias[a]

[a] *HOSPITAL UNIVERSITARIO 12 DE OCTUBRE, Madrid, SPAIN*

** Presenting author (manuelsantanacas@gmail.com)*

Purpose

To illustrate the case of a patient with corneal microperforation due to an underlying systemic disease and subsequent surgical repair with corneal lamella and fibrin sealant, reaching good surgical and symptomatic outcome.

Setting

Ophthalmology Department, Hospital Universitario 12 de Octubre, Madrid, Spain.

Report of case

We present the case of a 64-year-old woman, with a personal history of Hodgkin Lymphoma type nodular sclerosis, bone marrow transplant and ocular GVHD, who presented to the ophthalmology emergency department complaining of watering, discomfort and red left eye for 4 days, which had intensified in the last 24 hours. Biomicroscopy examination of the left eye revealed an area of perforation of 1x1 millimeters in size, accompanied with positive Seidel sign and atalamia.

Complete mydriatic treatment, in addition to topical antibiotic therapy was decided, along with therapeutic contact lens application. In the absence of improvement, admission to the operating room was considered to surgical closet the corneal microperforation. Treatment with a corneal graft was decided, since an amniotic membrane would be insufficient. A 1.2x1mm graft was carved on a donor corneal cryopreserved lamella as a seal to be used. Given the size of the perforation, fibrin glue tissue adhesive was for corneal lamellar attatchment, achieving tightness of the graft, without the need for subsequent sutures.

In the follow-up, stability of the graft is checked, as well as good recovery of the anterior chamber. Four months after the surgery, the corneal thinning was only about 30% meassured by anterior segment optical coherence tomography, although a new thinned area was observed temporal periphery of about 10-20%, which was compensated by the surrounding epithelial hypertrophy, accompanied by neovessels and without infiltrate, not suggesting a risk of a new perforation.

The patient currently has a best corrected visual acuity of 0.5 Snellen decimal scale in her left eye. The refractive error is -2.25 diopters of astigmatism. The treatment currently only includes moistening eye drops.

Conclusion/Take home message

GVHD can have devastating effects to the corneal surface, including corneal perforation as in our case. Tissue adhesives can be a good surgical choice in small corneal repairs, reducing the risk of high postoperative refractive error by avoiding the use of corneal sutures. Correct carving of the graft is crutial for the surgical result and the reduction of postoperative leukoma.

Abstract #125

Monkeypox virus keratitis, anterior uveitis, and corneal opacities refractory to treatment in an immunocompetent patient: a unique case report

J. Seco-Orriols*[a], A. Casablanca-Piñera[a], A. Pairo[b], I. Bourleau[a], S. Marias[a], P. Marjalizo[a], J. Torras-Sanvicens[a]

[a] *Hospital Clinic Barcelona, Barcelona, SPAIN ;* [b] *Vall d'Hebron Hospital, Barcelona, SPAIN*

** Presenting author (seco@clinic.cat)*

Purpose

Monkeypox virus infection is a significant public health concern worldwide given its potential for severe manifestations and the propensity for outbreaks.

Our aim is to present a case involving an immunocompetent patient whose sole manifestation of the infection is recurrent keratitis, anterior uveitis, and refractory corneal opacities. Through this case presentation, we endeavor to enhance comprehension of the behavior of the monkeypox virus and share the management approach we employed for addressing this intricate scenario.

Setting

According to a meta-analysis conducted in August 2023, there have been 48 reported cases of keratitis and ten cases detailing corneal scarring or opacities associated with monkeypox virus infection. Additionally, four case reports have documented anterior uveitis, among which only one case presented with ocular hypertension.

Report of case

We present the case of a 35-year-old immunocompetent patient who came to the emergency department for the first time in September 2022. The patient exhibited minimal skin lesions and reported discomfort localized in the left eye. Upon examination, a corneal erosion was detected, and subsequent sampling revealed a weakly positive result for Monkeypox virus via polymerase chain reaction (PCR). Additionally, a smear obtained from a skin lesion yielded a negative PCR result. Treatment commenced two days later, comprising oral tecovirimat, erythromycin ointment, cyclopentolate, and povidone-iodine 0.6% eyedrops (IODIM). Following one week of treatment, erosions were not evident, although several diffuse corneal opacities persisted. A conjunctival smear was subsequently performed, returning a negative PCR result, prompting the initiation of treatment with dexamethasone eye drops in a descending regimen. Optical coherence tomography conducted two months later revealed a diffuse haze-type scar, measuring 300 microns in depth within the anterior segment.

In January and March 2023, the patient sought further consultation due to exacerbation of symptoms. On both occasions, an infiltrated geographic corneal ulcer was observed, with PCR analysis confirming the presence of Monkeypox virus. Treatment was reiterated according to the previous regimen.

In May and June 2023, the patient experienced recurrences in the form of uveitis, characterized by pigmented retrokeratic precipitates and endotheliitis. Management involved tecovirimat, brimonidine, and topical and subconjunctival corticosteroids. Following a gradual reduction in the corticosteroid regimen, adjustments were made in August, substituting topical dexamethasone drops with topical fluorometholone administered every 8 hours, while maintaining topical brimonidine.

In December, topical brimonidine was discontinued, and a descending regimen of fluorometholone was initiated, complemented by cyclosporine 0.1% eyedrops every 12 hours.

As of February 2024, the patient remains asymptomatic, achieving a visual acuity of 0.8 for the first time since the onset of the infection, albeit with persisting corneal opacities.

Conclusion/Take home message

Monkeypox virus infections with ophthalmic manifestations are infrequent, rendering their diagnosis and management challenging. Due to the absence of well-defined treatment protocols, a tailored approach is warranted for each patient. Tecovirimat is currently accessible for clinical utilization through an expanded-access protocol and appears to enhance clinical outcomes in severe cases of monkeypox.

Severe ocular manifestations, such as anterior uveitis accompanied by ocular hypertension, may occur in immunocompetent individuals without underlying medical conditions, even in the absence of significant systemic symptoms.

The management of corneal opacities and recurrences poses significant challenges. Based on our clinical observations, cyclosporine drops appear to be a preferable option to corticosteroid therapy for addressing these intricate cases.

Abstract #126

Oral gliptin intake causing worsening of ocular mucous membrane pemphigoid

S. Shanbhag*[a]

[a] *LV PRASAD EYE INSTITUTE, Hyderabad, INDIA*

** Presenting author (swapnashanbhag@lvpei.org)*

Purpose

To describe a case of ocular mucous membrane pemphigoid which worsened after oral gliptins were started for treatment of diabetes mellitus

Setting

This case was treated at a tertiary care institute.

Report of case

A 62 year old female was referred as a case of ocular mucous membrane pemphigoid with marked worsening of her ocular condition with large tarsal and bulbar conjunctival epithelial defects. The patient was not started on systemic immunosuppression when she was referred. At our centre, the patient was examined and she was noted to have inferior forniceal shortening in both eyes with dry eye. The cornea was clear in both eyes and the patient maintained good vision. She was treated with topical and oral immunosuppression. To elicit the cause for worsening, on eliciting further history, patient was started on oral gliptin medications for the control of diabetes mellitus. The worsening of the ocular condition coincided with the oral gliptin intake. Hence, the patient was referred to her physician to stop oral gliptins and to shift her to another class of oral medications for control of diabetes mellitus. The epithelial defects on the ocular surface resolved in both the eyes over the next one month.

Conclusion/Take home message

Oral gliptins given for diabetes mellitus can cause true mucous membrane pemphigoid. For patients with established ocular mucous membrane pemphigoid, worsening of the ocular condition can occur due to new-onset oral gliptin intake.

Abstract #127

Therapeutic penetrating keratoplasty in a rare case of corneal abscess with Capnocytophaga gingivalis: A Case Report.

S. Sheriff*[a], H. Dua[a], D. Said[a], F. Elzawahry[a]

[a] *NHS, Nottingham, UNITED KINGDOM*

** Presenting author (dr_sameena@yahoo.com)*

Purpose

Purpose: To report a rare case of Capnocytophaga gingivalis necrotizing keratitis, which was managed with an urgent therapeutic penetrating keratoplasty.

Setting

Capnocytophaga Gingivalis is an anaerobic fastidious gram-negative bacillus and has been reported as a causative agent of periodontitis, dental abscess, and necrotizing ulcerative gingivitis. Keratitis is rare, albeit an aggressive ocular infection, often associated with diffuse corneal involvement, extensive keratomalacia, and a poor prognosis.

Report of case

We present a case of 81-year-old male patient who was first seen two months ago in our eye clinic. He gave a past history of left eyelid papilloma, which was treated in 2016 with surgical excision. Later, he was further treated with proton beam therapy for a recurrence in the same eye in Switzerland. Then, the eye started to develop further problems, for which he attended Moorfeilds Hospital in London. In 2019, he underwent a tube shunt procedure for glaucoma in the left eye and also had a simple limbal epithelial transplant in the same eye. He developed a post-operative infection, after which his cornea deteriorated with significant deterioration of vision.

He was diagnosed with a scarred, vascularized cornea, along with ocular surface features suggestive of possible recurrent papilloma. He was treated with alternate cycles of topical mitomycin C and prednisolone. He underwent an extensive evaluation of his left eye to determine the visual potential, including a B scan, VEP, and ERG, and was likely to be listed for a left corneal biopsy and/or limbal stem cell transplantation with keratoplasty. He was followed up on two weeks later and was doing well with the therapy.

Six weeks later, he returned to our clinic with a left-eye total corneal abscess with impending perforation. He gave a preceding history of tooth infection and was waiting for dental extraction. He was treated with hourly gt Cefuroxime 5%, Amikacin 2.5% and oral ciprofloxacin. His corneal scraping culture came positive for Capnocytophaga gingivalis, sensitive to chloramphenicol and ciprofloxacin. He underwent an urgent large corneal graft therapeutic penetrating keratoplasty along with the removal of a hypermature brown shrunken cataract with open sky continuous circular rhexis. The patient is currently receiving appropriate topical and systemic treatment, has a stable anterior chamber and eye pressure, and settling well.

Conclusion/Take home message

With promt intensive antibiotics and therapeutic keratoplasty, we have managed to salvage, which, in most cases of infection with this bacterial strain, has ended in enucleation.

Abstract #128

A Five-Year Report of Pediatric Microbial Keratitis in a Tertiary Eye Center

MD. Tas*[a], M. Palamar[a], S. Aydemir[b], O. Selver Barut[a]

[a] *Ege University, Department of Ophthalmology, Izmir, Turkey, Izmir, TURKEY ;* [b] *Ege University, Department of Microbiology, Izmir, Turkey, Izmir, TURKEY*

** Presenting author (daratas62@gmail.com)*

Purpose

To evaluate the demographic data, risk factors, clinical outcomes, microbial spectrum, and treatment in pediatric microbial keratitis cases.

Setting

A total of 27 patients younger than 18 years who were diagnosed with keratitis in a tertiary referral center between March 2019 and December 2023 were included in the study.

Methods

The medical data including demographics, predisposing factors, accompanying diseases, clinical course, and microbial culture results was retrospectively evaluated.

Results

The M/F ratio was 14/13. The mean age was 13.02 ± 6.21 years. The most common risk factor was contact lens use (33.8%) followed by trauma (18.5%). The most accompanied disease was acne rosacea (7.4%). In 20 cases culture samples were taken. Cultures were positive in (40.0%) patients and *Pseudomonas aeruginosa* was the most frequently isolated organism (25.0%). Empiric treatment initiated and changed according to the culture results. While 24 (88.8%) of the keratitis eyes improved with medical treatment alone, additional corneal debridement was applied to 2 (12.5%) eyes, and therapeutic penetrating keratoplasty was performed in one case.

Conclusions

Although rarer than adult cases, pediatric keratitis is an important entity in childhood due to difficulties and complications in history taking, examination and medication use. This study emphasizes the role of contact lens usage and trauma as the primary causes and *Pseudomonas aeruginosa* as the most frequent microorganism in pediatric keratitis. Identification of predisposing factors and microorganisms may be helpful for early recognition and treatment of pediatric microbial keratitis.

Financial Disclosure of all authors

The authors have no relevant financial or nonfinancial interests to disclose. Author Muhammed Dara Tas declares that he has no conflict of interest. Author Melis Palamar declares that she has no conflict of interest,Author Sohret Aydemir declares that he has no conflict of interest, Author Ozlem Barut Selver declares that she hasno conflict of interest.

Abstract #129

Microbial keratitis trends over 16-years in Bath

S. Tavassoli*[a]

[a] *ROYAL UNITED HOSPITAL BATH, Bristol, UNITED KINGDOM*

** Presenting author (shokufeh_tavassoli@hotmail.com)*

Purpose

Microbial keratitis is a common acute corneal condition, most commonly occurring in contact lens wearers, especially those that may swim or shower with contact lenses in place. As part of the investigations, a cornea scrape is performed to identify the responsible organism. This helps with initiating appropriate antimicrobial treatments. The purpose of this study was to consider organism patterns and antimicrobial sensitivity over a 16-year period from a district general hospital in the south west of the UK.

Setting

Department of Ophthalmology, Royal United Hospitals, Bath, UK.

Methods

This was a retrospective review of all cornea scrapes performed at the Royal United Hospitals, Bath in the UK, over a period from January 2006 to December 2022. Data collection included details of the organism picked up from either direct or enrichment culture, as well as the antimicrobial sensitivities of the organism. Retrospective data collection was performed using data available on a microbiology database. Monotherapy with a fluoroquinolone antibiotic was typically used first line in this unit throughout the study period.

Results

A total of 611 cornea scrapes (323, 52.8% culture positive) were performed in the 16-year period. Organisms cultured were; bacteria 94% (68% gram-positive, 32% gram-negative), fungi 4.4% and acanthamoeba 1.6%. The most commonly identified organism was pseudomonas aeruginosa (n=70). There was a statistically significantly rise in cases of pseudomonas aeruginosa in 2022 compared to 2018 (p-value=0.02). All gram-negative bacteria were sensitive to the first line fluoroquinolone antibiotics used in this unit, 93% of gram-positive bacteria were sensitive to the first line fluoroquinolone antibiotics used in this unit, the 7% that were resistant to this, were sensitive to vancomycin.

Conclusions

Our data compares well with previously published UK data. Monotherapy with a fluoroquinolone antibiotic, was fully sensitive against gram-negative bacteria, and against the majority of gram-positive bacteria (93%). It is thus vital to consider antimicrobial sensitivities especially where a gram-positive organism is identified. Given our study considered cornea scrape results alone, a limitation of the study was that data on patient risk factors was not available. Nonetheless, in view of the rise in cases of pseudomonas in recent years, it may be helpful to ensure public health measures are taken to help increase local community awareness on contact lens hygiene.

Financial Disclosure of all authors

No financial disclosures

Abstract #130

A 12-Year Retrospective Analysis Of Fungal Keratitis In A Tertiary Care Hospital - Predicting Risk Factors And OcularComplications.

R. Teixeira-Martins*[a], M. Ribeiro[a], AM. Cunha[a], I. Coelho-Costa[a], P. Neves-Cardoso[a], L. Torrão[a], J. Pinheiro-Costa[a]

[a] *CENTRO HOSPITALAR UNIVERSITÁRIO SÃO JOÃO, Porto, PORTUGAL*

** Presenting author (martins.anarita95@gmail.com)*

Purpose

To ascertain the microbiological characteristics, risk factors, treatment approaches, and rates of surgical intervention for fungal keratitis in a tertiary referral center.

Setting

Department of Ophthalmology in Centro Hospitalar e Universitário de São João, a tertiary referral medical facility situated in Porto, Portugal

Methods

A retrospective study of record medical data from hospitalized patients treated from January 2009 until December of 2021

Results

Our study included 53 patients (54,7% over 65 years old; 43,4% male).The fungal cultures isolated filamentous fungi in 25 patients and yeast in 28. Candida *spp* (50,9%) and Fusarium *spp* (18,9%) were the predominant species. Among risk factors, The most significant were contact lens user (47.2%) and prior use of topical corticotherapy (45,3%). Regarding the topical antifungals, the most used were voriconazol (22,6%) and amphotericin B (18,9%). 29 patients required keratoplasty surgery. Ocular complication included evisceration in 13 patients and endophthalmitis in 5. No statistically significant changes at BCVA were observed after treatment (p=0,599).

Conclusions

Risk factors are frequently observed in the majority of patients with fungal keratitis. Our study underscores the diverse clinical manifestations associated with this pathology and the challenges of managing ocular complications. Additional samples are needed to validate these results and improve patient outcomes.

Financial Disclosure of all authors

No financial disclosure to declare

Abstract #131

Cytomegalovirus as a cause of recurrent corneal endotheliitis in the Western population and response to chronic low-dose valganciclovir therapy

W. Trask*[a]

[a] *Section of Ophthalmology, University of Calgary, Calgary, CANADA*

** Presenting author (williamt8@gmail.com)*

Purpose

To describe the clinical manifestations, response to antiviral treatment, and long-term visual outcomes of cytomegalovirus endotheliitis in a Canadian population.

Setting

Single-location surgical cornea subspecialty clinic in Calgary, Alberta, Canada

Methods

A retrospective review of all patients (9 eyes of 7 patients) presenting with corneal endotheliitis to 1 corneal specialist over a ten year period in Calgary, Alberta, Canada was completed. All patients were immunocompetent and were submitted to anterior chamber biopsy with polymerase chain reaction (PCR) positive for cytomegalovirus. Each received systemic valganciclovir for a minimum of 3 months. Primary outcomes included visual acuity, intraocular pressure control, medication dependence, and corneal status.

Results

Average follow-up was 76.4±11.8 months; two patients had bilateral disease. Corneal manifestations included linear, disciform, and circinate patterns of endotheliitis. Best-corrected visual acuity improved from a mean of 0.48±0.19 logMAR at presentation to 0.24±0.11 logMAR at last follow-up. Intraocular pressure decreased from a peak of 35±3.1mmHg to 14.2±4.3mmHg. Ocular hypotensive medications were reduced from 2.6±0.45 to 0.89±0.29 agents. Two eyes required endothelial transplantation. Valganciclovir therapy was well tolerated; at last follow-up, all patients were stable on low-dose valganciclovir at an average dose of 1395mg per week.

Conclusions

Cytomegalovirus endotheliitis has been extensively described in the East Asian literature but reports of this entity in the West remain extremely scarce. Our findings highlight the importance of considering CMV in the differential diagnosis of relapsing corneal endotheliitis regardless of geographic distribution or immunologic status. Moreover, this series demonstrates for the first time the efficacy of chronic low-dose antiviral maintenance therapy in the longterm management of CMV endotheliitis.

Financial Disclosure of all authors

Dr. William Trask - No financial conflicts to disclose
Dr. Jamie Bhamra - No financial conflicts to disclose

Abstract #132

To study the epidemiological profile and laboratory Vitamin A levels in paediatric infectious keratitis cases at tertiary teaching hospital in North India

N. Trivedi*[a], R. Arora[a], S. Saxena[b], B. Goswami[c], P. Jain[a], R. Pant[d]

[a] *DEPARTMENT OF OPHTHALMOLOGY, MAULANA AZAD MEDICAL COLLEGE & ASSOCIATED GURU NANAK EYE CENTRE, New Delhi, INDIA ;* [b] *DEPARTMENT OF MICROBIOLOGY, MAULANA AZAD MEDICAL COLLEGE, New Delhi, INDIA ;* [c] *DEPARTMENT OF BIOCHEMISTRY, MAULANA AZAD MEDICAL COLLEGE, New Delhi, INDIA ;* [d] *THE GEORGE INSTITUTE FOR GLOBAL HEALTH, Delhi, INDIA*

** Presenting author (drnanditatrivedi@gmail.com)*

Purpose

To investigate the sociodemographic, social and laboratory Vitamin A levels associated with pediatric infectious keratitis at a tertiary ophthalmic setup attached to a teaching hospital in Northern India

Setting

This prospective study was conducted in 45 patients in the age group 1 month to 18 years presenting to our facility between August 2022 to January 2024 with infectious keratitis. Additional 45 age and gender matched children were recruited for comparison of vitamin A levels only.

Methods

All cases underwent detailed history (duration of ocular problem, breastfeeding, immunisation status, preceding illness) and ophthalmological assessment including visual acuity (wherever possible) and slit lamp biomicroscopy. Corneal scraping was done for all patients baring those with thin and perforated cornea and microbiological analysis was carried out i.e. smear examination and culture plating. The treatment was initiated and continued accordingly. 2ml of blood sample was drawn from all the cases and controls and sent for vitamin A analysis. Vitamin A analysis was done by Ultra High Performance Liquid Chromatography using commercially available standards.

Results

Mean age of children was 4.2±5.4years. Age distribution of children being <6months(20), 6months-1year(5), 1-5years(6) and >5years(14). 18(40%) children were exclusively breastfed in initial 6 months of life. 36(67.9%) of 53 eyes were culture positive. Mean vitamin A levels in cases and controls was 0.16±0.09mg/l and 0.26±0.12mg/l respectively ($p<0.0001$, 95% CI 0.06-0.15). The mean difference being statistically significant in age group <6 months and >5 years. The risk of Vitamin A deficiency in infectious keratitis in <6 months old children was 6 times higher than controls.

Conclusions

There is 6 times higher risk of infectious keratitis in children less than 6 months of age with vitamin A deficiency. Strategies to focus on vitamin A supplementation to infants and mothers within 6 weeks of delivery are needed to prevent corneal blindness in children due to vitamin A deficiency.

Financial Disclosure of all authors

NIL

Abstract #133

Estrogen-receptor ß mediated novel pathway via Endothelin-1 in Fuchs endothelial corneal dystrophy (FECD)

S. Zwingelberg*[a]

[a] *UNIVERSITY OF COLOGNE, Köln, GERMANY*

** Presenting author (sarah.zwingelberg@uk-koeln.de)*

Purpose

To evaluate the expression of estrogen receptors (ER) α and β at the endothelium of the cornea in patients with Fuchs endothelial corneal dystrophy (FECD).

Setting

Patients with FECD who underwent DMEK at the University Hospital Cologne, Center for Ophthalmology, between January 2023 and May 2023 were included in the study.

Methods

For the expression analyses of ER α and β, endothelin (ET)-1, fibronectin, vimentin(VIM)FL, and VIM3, the surgically obtained tissue samples were used in the context of a routinely performed Triple-DMEK (Descemet Membrane Endothelial Keratoplasty). Healthy corneal samples from donors were used as a comparative cohort. RNA- extraction paraffin embedded tissues and quantitative RealTime PCR (qRT-PCR) as well as immunhistochemical analyses have been performed. For statistical analysis, the GraphPad Prism 5 program was used. Significant differences were calculated and indicated by stars (* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$)

Results

ER α and ß as well as ET-1 showed a twofold significance in qRT-PCR and were showed a positive staining in IHC. Fibronectin, VIMFL, and VIM3 were detected at the mRNA level and by immunohistochemistry in patients with FECD.

Conclusions

Our study is a first description of ERα and ß in patients with FECD, which are highly significantly expressed at the endothelium of those patients. ER ß leads to an increase of ET-1, which is also revealsed for the first time, which may be a further target point in the lymphangiogenesis in patients with FECD. Fibronectin, VIMFL and VIM3 was more pronounced in patients with a histologically visible fibrillar layer. In consequence, our study describes a novel pathway in FECD, which enable possible new therapeutic target points.

Financial Disclosure of all authors

no financial interest

Keratoconus & Collagen Cross Linking

Abstract #134

Minimal Invasive Topography Guided Photorefractive Keratectomy with Custom Cross Linking (MITCX)

W. Altroudi*[a]

[a] *EBSAAR EYE SURGERY CENTER, Dubai, UNITED ARAB EMIRATES*

** Presenting author (wraltroudi@gmail.com)*

Purpose

The objective of this study is to evaluate the efficacy, safety, and predictability of a new surgical intervention known as Minimal Invasive Topography-Guided Photorefractive Keratectomy with Custom Cross Linking (MITCX) in progressive keratoconus patients with contact lens intolerance (CLI). MITCX is a modification of simultaneous topography guided PRK with collagen cross linking technique to try to minimize tissue consumption, enlarge the treatment zone, and customize the CXL by using the epithelium as a shield.

Setting

MITCX was performed in a patient with progressive keratoconus reporting CLI, night vision problems and poor best documented visual acuity (BDVA) at Ebsaar Eye Surgery Centre, Dubai, United Arab Emirates.

Methods

To plan MITCX, the epithelial map (Zeiss OCT Cirrus 5000), 8 scheimpflug images (Wavelight ocullyzer II) and T-Cat profile were used (EX 500 Wavelight excimer laser platform from Alcon). The astigmatism and sphere magnitude were modified to achieve a hyperopic portion of the treatment profile (ablating 10 to 15 microns) and a myopic portion (ablating 30 to 40 microns) of the stroma after subtracting the thickness of the epithelium (optical zone: 6.0-6.50mm). The remaining epithelial sheet provided a shield to the stroma and customized the effect of CXL by using accelerated CXL 9mw/cm^2 for 10 minutes (peschke PXL-PLATINUM 330).

Results

Pre-surgery, the patient had -1.50/-1.75@40 and corrected distance visual acuity (CDVA) of 0.4 Log MAR. Post-surgery (5 years) the patient had CDVA of 0.0 Log MAR with -2.50/ -1.50 @ 100, symptoms improved and topometric indices decreased. A 12.5 dioptres of regularization in the sagittal curvature of the front surface of the cornea were achieved with tissue consumption of 28- and 28-microns in the center of the pupil and the thinnest point of the cornea, respectively.

Conclusions

This technique minimizes tissue consumption, induces customization of the CXL, achieving better regularization effect vs tissue consumption, providing better surgery outcomes as it allows the epithelium to protect the flat areas next to the cone from receiving undesired laser. It is minimal invasive and allows treating larger optical zones and thinner corneas using a holistic approach of the cornea by respecting the important role of the epithelium.

Financial Disclosure of all authors

No financial interest to disclose.

Abstract #135

Evaluation of outcome of pulsed accelerated corneal collagen cross linking (PACXL) in paediatric keratoconus.

R. Arora[a], A. Mehta*[a], P. Jain[a], P. Dutta[a]

[a] *GURU NANAK EYE CENTRE, Delhi, INDIA*

** Presenting author (mehta.arun9cb@gmail.com)*

Purpose

To evaluate the outcome of pulsed accelerated corneal collagen cross linking in paediatric keratoconus.

Setting

Paediatric keratoconus patients who presented to a tertiary care eye centre were included in the study.

Methods

Study design: Prospective interventional study .

Methodology :37 eyes of 28 patients with documented keratoconus who presented to a tertiary eye care centre underwent Pulsed Accelerated CXL (9mW/cm^2 for 15min;10 sec on & 5 sec off). Visual acuity , slit lamp examination , refraction , topography and ASOCT were assessed preoperatively and upto 6months after the procedure.

Results

The mean KMax significantly decreased from 57.41 ± 6.4D to 56.82 ± 5.74D at 6 months (p=0.045). Mean flat keratometry and steep keratometry showed statistically significant reduction over preoperative values. Demarcation line was measured at a mean depth of 304.05 ± 51.93μm. The mean UCVA significantly improved at 3 months and at 6 months (0.71 ± 0.49logMAR , p=0.028).Mean best spectacle corrected visual acuity (BSCVA) showed significant improvement at 6 months (0.24 ± 0.23logMAR, p=0.012) from baseline (0.31 ± 0.22logMAR) .16.21% (6/37) eyes had progression (>1D) , 1patient had lost > 1 snellen line on BSCVA . 3 patients developed sterile infiltrates.

Conclusions

The study suggests that pulsed accelerated CXL effectively stabilizes keratoconus and improves visual outcomes in children.

Financial Disclosure of all authors

Nil

Abstract #136

Acute hydrops: compression sutures and contact lens for visual rehabilitation

N. Bejan Singh*[a]

[a] *BEJAN SINGH EYE HOSPITAL, Nagercoil, INDIA*

** Presenting author (niranjanabsingh@yahoo.co.in)*

Purpose

effectiveness of corneal compression sutures for treating acute hydrops and use of rose k contact lens to treat the irregular astigmatism

Setting

Bejan Singh Eye Hospital, nagercoil, India

Report of case

10 year old boy presented to us with sudden loss of vision in left eye for 2 days. He was diagnosed with acute hyrops with edema obscuring the pupillary axis in left eye. Right eye was normal.Paracentral DM tear was noted with ASOCT. Full thickness corneal compression sutures were applied under general anaesthesia. Cornea healed with scarring paracentrally and sutures were removed 1 month postoperatively. His vision at 1 month was 1/60. His parents were informed about the need for keratoplasty in the future but he was lost to followup due to COVID 19 pandemic He reviewed again after 2 years with uncorrected visual acuity of 3/60 inproving to 6/60 with glasses. Rose K2 IC lens improved his vision to 6/6p and patient is attending school and carrying on with his daily activities. he is maintaining his vision for past 18 months

Conclusion/Take home message

corneal compression sutures may be an effective treatment of acute hydrops for children and uncoperative patients requiring general anaesthesia as a one step procedure and trial of contact lens in coroperative patients to delay keratoplasty as late as possible

Abstract #137

Multicenter, Randomized, Double-Masked, Sham-Controlled, Parallel-Group Phase 3 FDA Study to Evaluate the Safety and Efficacy of Epithelium-On Corneal Cross-Linking in Subjects 8 to 45 Years of Age with Keratoconus

M. Belin*[a]

[a] *UNIVERSITY OF ARIZONA, Marana, Arizona, UNITED STATES*

** Presenting author (michaelwbelin@gmail.com)*

Purpose

To present the current / interim status of the Phase 3 FDA trail on epithelium-on corneal crosslinking in subjects with keratoconus ages 8 - 45 years. Epithelium-Off corneal crosslinking (CXL) has become the standard of care for treating ectatic disease. While epithelium-off CXL is highly effective, it is associated with a slow recovery and occasional severe complications. There is increased interest in epithelium-on CXL to limit complications and provide a more rapid recovery. To date, however, there is no USA FDA approved epithelium-on technique.

Setting

23 USA based study sites with a broad geographic and ethnic distribution at both academic and private settings.

Methods

Epion Therapeutics instituted a randomized, multicenter, double-masked, placebo controlled Phase 3 FDA trial in late 2023 to study safety and effectiveness of a unique riboflavin formulation with the addition of sodium iodide (Ribostat) in keratoconic subjects ages 8 - 45 with 1:1 randomization (active/sham). Enrollment based on standardized tomographic criteria from the Pentacam BAD display and treatment upon initial diagnosis. Bilateral, simultaneous treatment can be performed if both eyes meet entrance criteria. Two study trials of 400 subjects per trail (800 total) with 12-month follow-up. The primary efficacy endpoint is an improvement in best spectacle corrected visual acuity.

Results

To date, all subjects showed a limbal-to- limbal stromal saturation of at least 3.5 on a scale of 1-5 after 30 minutes of Ribostat installation without the need for any subsequent drops or additional drops during UVA application. Approximately 70% of subjects qualified for and opted for bilateral, simultaneous treatments. To date there have been no reported serious adverse events. Updated safety data will be presented.

Conclusions

Epithelium-on CXL offers potential advantages in both safety and comfort. The improved safety profile of epithelium-on CXL would also support earlier intervention in the hope of preventing visual loss at the earliest possible stage and emphasizes the importance of early diagnosis.

Financial Disclosure of all authors

Michael W. Belin, MD is Chief Medical Office of Epion Therapetics and receives non-employee compensation.

Abstract #138

EPI-OFF ACCELERATED CROSS-LINKING FOR RECURRENT KERATOCONUS MANAGEMENT-LONG-TERM RESULTS

E. Bonacci*[a]

[a] *EYE CLINIC OF THE UNIVERSITY OF VERONA,, Verona, ITALY*

** Presenting author (erika.bonacci@univr.it)*

Purpose

To report the 4 year-changes of both tomographic and biomechanical corneal parameters after epi-off accelerated-CXL (A-CXL)in patients with RKC

Setting

Eye Clinic of the University of Verona.

Methods

Patients treated with epi-off A-CXL for RKC between Jan 2017, and Dec 2018, were included in the study. We excluded eyes undergoing other surgical procedures after A-CXL. All included eyes underwent a complete ocular examination including slit lamp biomicroscopy, corneal pachymetry, and both tomographic and biomechanical analysis, at baseline (T0 - pre-A-CXL), at 1 year (T1), and after 4 years (T4) from the A-CXL. The best correct visual acuity and the manifest refraction equivalent sphere were also evaluated using the Snellen chart and the CSO Vision Chart respectively, at the same time points.

Results

we included 25 eyes of 18 patients with a mean age of 61.5±3.1 years. PK and DALK were performed in 9 and 16 eyes, respectively, 21.1 (±4.59) and 15.1 (±3.1) years before the diagnosis of RKC. Bilateral RKC was found in 6 eyes, 4 with PK and 2 with DALK. No significant differences were found in Kmax, ARC, PRC, e^2, TCT and CCT($p>0.05$). Differences in SP-A1 and -Appl 1 velocity and improvement of at least 1 and 2 Snellen lines in BCVA in 40 and 20% of eyes at T1 and T4.

Conclusions

CXL might be a valid and safe alternative to try to avoid a second keratoplasty. Indeed, in our study neither the Kmax nor the CCT or the TCT experienced any significant changes between the analyzed time points (all $p>0.05$). This suggests that if the CXL is being performed at the very beginning of disease recurrence, when a good BCVA is still available, successive invasive treatments to restore the visual potential might be avoided. Indeed none of the included eyes needed to undergo a repeated keratoplasty after the CXL procedure.

Financial Disclosure of all authors

no financial disclosure to declare

Abstract #139

Keratoconus: does the ocular surface microbiota play a role? A multicenter validation study.

D. Borroni*[a], C. Bonzano[b], C. Mazzotta[c], M. Rechichi[d], C. Rocha-De-Lossada[e]

[a] RIGA STRADINS UNIVERSITY, Riga, LATVIA ; [b] DiNOGMI, University of Genoa and IRCCS San Martino Polyclinic Hospital, Genoa, ITALY ; [c] Siena Crosslinking Center, Siena, ITALY ; [d] Centro Polispecialistico Mediterraneo, Sellia Marina, ITALY ; [e] Ophthalmology Department, Hospital Regional Universitario Málaga, Malaga, SPAIN

** Presenting author (info.borroni@gmail.com)*

Purpose

To characterize the ocular microbiota of patients diagnosed with keratoconus who have not undergone any prior surgical treatment using the mNGS 16S rRNA sequencing method.

Setting

Virgen de las Nieves University Hospital (Spain)
Siena Crosslinking Center (Italy)
Centro Oculistico Borroni (Italy)

Methods

Samples were collected with an eNAT with 1 mL of Liquid Amies Medium. The eNAT was applied on the inferior surface of the eye and moved two times, “limbus to fornix to limbus”. Microbial DNA from keratoconus and healthy control samples were standardly isolated using QIAamp DNA Microbiome Kit (Qiagen, Hilden, Germany). DNA libraries were set with Ion 16S Metagenomics Kit (Thermo Fisher, Waltham, MA, USA). Raw reads were analyzed with GAIA (v 2.02) The richness and Shannon alpha diversity metrics, as well as Bray-Curtis beta diversity values, Chao1 and Mann-Whitney, were computed with the R package phyloseq.

Results

We found significant differences in the distributions of the relative abundance of several phyla between the healthy control and the KC condition, in particular the phyla Actinobacteriota (0% in control vs. 18.68% in KC), Bacteroidota (0% in control vs. 0.51% in keratoconus), unkn. Bacteria(d) (4.43% in control vs. 0% in KC), Actinobacteria (7.60% in control vs. 0% in KC), and Bacteroidetes (5.97% in control vs. 0% in KC).

Conclusions

Our study presents a comprehensive comparison of the microbiota composition of naïve KC and a control group derived from the findings obtained in our previous research at various taxonomic levels, revealing distinct differences between both groups, which suggest a potential role for the microbiota in the pathogenesis of KC.

Financial Disclosure of all authors

None

Abstract #140

Multimodal Evaluation of Accelerated Epi-off Cross-Linking: Corneal and Retinal Outcomes in Progressive Keratoconus.

L. Calabrese*[a], CA. Cutolo[a], A. Schiavi[a], M. Iester[a], CE. Traverso[a], C. Bonzano[a]

[a] *UNIVERSITÀ DEGLI STUDI DI GENOVA, Genova, ITALY*

** Presenting author (lauracalabrese920@gmail.com)*

Purpose

Corneal collagen crosslinking (CXL) is a safe procedure for treating progressive keratoconus (KC). This study aims to identify any potential postoperative changes in foveal and parafoveal retinal thickness, superficial capillary plexus (SCP), deep capillary plexus (DCP), retinal nerve layer thickness (RNFL), ganglion cell complex (GCC), as well as in corneal and optical biometry parameters in patients who underwent the accelerated epi-off protocol (aCXL).

Setting

Our study was conducted at the Eye Clinic, University of Genoa, and IRCCS San Martino Polyclinic Hospital, Genoa, Italy.

Methods

Twenty-two eyes treated with epi-off aCXL were analyzed. A multimodal imaging assessment, including corneal topography (TMS-4N, Tomey), corneal pachymetry (RTVue-XR Avanti, Optovue), and biometry measurements (OA-2000, Tomey), was performed preoperatively and at each postoperative visit at one and three months, respectively. The superficial capillary plexus (SCP), deep capillary plexus (DCP), retinal layer nerve fiber thickness (RNFL), and the ganglion cell complex (GCC) were evaluated using optical coherence tomography angiography (OCTA) (DRI OCT Triton, Topcon) at each visit.

Results

Data from 22 eyes were included. Mean age was 27.7 ± 6.2 years, 6 (27.2%) females. Corneal indexes underwent a significative reduction at three months ($p < 0.001$) after a transitory increase at one month. No significant changes were detected in biometry measurements. Central corneal thickness remained unchanged. There was no significant difference in choroid capillary and SCP. There was a significant but minimal decrease in the DCP that returned to normal after 3 months. No significant change was detected in foveal or parafoveal retinal thickness. We observed a minimal increase in RNFL and GCC at 3 months.

Conclusions

Our study reinforces the safety and efficacy of aCXL for progressive keratoconus. Notable corneal changes, including reductions in meridian, apex, and asymmetry, are observed at three months. Transient alterations in the deep capillary plexus suggest the reversible nature of any impact on the retina. Optical and biometric parameters remain stable, affirming the procedure's safety. Minimal differences in retinal nerve layer and ganglion cell complex suggest positive long-term outcomes, potentially due to improved scans. These findings support accelerated epi-off cross-linking as a promising therapeutic avenue, emphasizing its safety and effectiveness in managing keratoconus.

Financial Disclosure of all authors

There are no financial conflicts of interest to disclose by any of the authors of the study.

Abstract #141

Perceptual Amblyopia Therapy for Improving Vision & Contrast Sensitivity Functions in Crosslinked Stable Keratoconus: Results of a Randomised Controlled Study

LR. Daniel Raj Ponniah*[a]

[a] *DR AGARWALS EYE HOSPITALS, TIRUNELVELI, S.INDIA, Tiurnelveli,, INDIA*

** Presenting author (drlionalraj@gmail.com)*

Purpose

To evaluate a computer-based perceptual visual therapy regime using Gabor patches for improving visual acuity and contrast sensitivity function (CSF) in crosslinked stable keratoconic eyes.

Setting

A Prospective, controlled randomized, open-label clinical study at the dept, of Cornea, in a tertiary eye care hospital.

Methods

A Prospective, controlled randomized, open-label study. Post CXL Keratoconus, stable for over one year, by serial clinical and topographic evaluations with BCVA worse than 20/40 were recruited and randomized in a 2:1 ratio into treatment (G1) and control (G2) arms. The study consists of 2 phases, screening period and therapy period. The post-therapy effectiveness was evaluated for improvement in Monocular Best Corrected Visual Acuity (BCVA) distance & near (ETDRS VA chart) and CSF in Cycles per Degree (CPD), say CPD -3, CPD-6, CPD-12, CPD-18 on the CSV-1000 E chart one.

Results

30 cases randomised into 2:1. Baseline BCVA was 68.20 (SD-8.11) & 67.40 (SD7.09) ETDRS characters in G1, and G2 respectively (p=0.793). The mean BCVA of perceptual learning group (G2) improved to 73.30 (SD-7.477) & 79.10 (SD-8.466) post-20 & 40 treatment sessions respectively, improved by over 2.5 equivalent Snellen's lines, (repeated measure ANOVA p<0.0001). The change in CSF at various spatial frequencies say, 3,6,12 & 18 CPD analyzed using Friedman tests showed significant improvements in contrast sensitivity at all spatial frequencies of 3,6,12,18 cpd, of the perceptual learning group (G1), & no improvement in the control group (G2)

Conclusions

Sequential, patient-specific, perceptual learning program based on visual stimulation improved vision and contrast sensitivity in crosslinked stable keratoconus with visual deficiencies & acts as a proof of concept of improving neural connections at the cortical level. Keratorefractive surgeons could consider this therapy as a post-operative therapeutic adjuvant in all post-CXL cases.

Financial Disclosure of all authors

The authors have no financial interests to disclose.

Abstract #142

Management of corneal melting after collagen cross-linking for keratoconus: a case report and a review of the literature

N. Di Geronimo*[a], A. Moramarco[a], L. Gardini[a], A. Grendele[a], L. Fontana[a]

[a] *Ophthalmology Unit, DIMEC, Alma Mater Studiorum Università di Bologna, Bologna, ITALY*

** Presenting author (natalie.digeronimo@icloud.com)*

Purpose

We are presenting the management of a case involving severe corneal melting following corneal cross-linking (CXL) for keratoconus in a young male. We aim to detail our staged approach that enabled us to carry out a deep anterior lamellar keratoplasty (DALK). This was made possible through the prior creation of a conjunctival flap, effectively reducing inflammation and stabilizing the patient's condition.

Setting

The surgery was performed in Sant'Orsola Malpighi Hospital in Bologna, Italy.

Report of case

A 12-year-old Caucasian boy with progressive visual loss was diagnosed with bilateral keratoconus, more severe in the left eye. Due to the high risk of progression and worsening symptoms, an accelerated epithelium-off cross-linking (CXL) protocol was performed on the left eye. However, two days post-treatment, the patient experienced intense pain, photophobia, and significant vision reduction (20/500). Examination revealed corneal stromal infiltration and an epithelial defect, leading to impending perforation. Topical therapy was initiated but, after three days, central corneal thinning prompted surgical intervention. To prevent perforation, a conjunctival flap using the Gundersen technique and temporary tarsorrhaphy were performed. Microbiological investigations ruled out infection and dermatological evaluation ruled out allergy. One month post-surgery, the conjunctival flap was stable, inflammation controlled, and pain relieved. Three months later, the conjunctival flap was trophic, vascularized, and uninflamed. Anterior segment optical coherence tomography (OCT) indicated stromal reconstitution, leading to the decision to attempt deep anterior lamellar keratoplasty (DALK) for vision restoration. During surgery, the conjunctival flap was recessed, and intraoperative OCT guided the injection of air, inducing separation between pre-Descemet layer and posterior stroma. A donor stromal lenticule was secured in place. At one day, the corneal lenticule was clear with no inflammation. Twelve months post-surgery, the patient's best-corrected visual acuity was 20/25, the graft was clear, and corneal astigmatism was 2.9 D. This comprehensive approach successfully managed the complications arising from the initial CXL procedure, highlighting the importance of timely surgical intervention and meticulous follow-up in pediatric keratoconus cases.

Conclusion/Take home message

Corneal cross-linking is a safe and effective technique in the treatment of keratoconus in children and adults; however, it can have serious complications that could eventually lead to corneal perforation. While identification of the causative agent is essential in guiding the therapy, it is not always possible to define a certain aetiology. To our knowledge, this is the first case of severe non-infectious corneal melting that was managed with a conjunctival flap and subsequent DALK. A conjunctival flap is an excellent option to save the integrity and to promote healing of the cornea, with the purpose of performing subsequent reconstructive surgery in an elective setting. When possible, DALK allows preserving the host corneal endothelium, reducing the risk of rejection and late endothelial failure that are particularly relevant in young patients.

Abstract #143

Clinical and Confocal Microscopy Correlation in a Pioneer Experience of Advanced Cell Therapy in Keratoconus

M. El Zarif*[a], K. Abdul Jawad[b], JL. Alió[c]

[a] *LEBANESE UNIVERSITY, Saida, LEBANON ;* [b] *Optica General, Saida, LEBANON ;* [c] *Vissum Grupo Miranza, Alicante, SPAIN*

** Presenting author (monazarifaj@hotmail.com)*

Purpose

Recently we described a new surgical approach based on advanced regenerative therapy, using autologous adipose-derived adult stem cells (ADASCs), and decellularized/recellularized human corneal stromal laminas with ADASCs into corneas with advanced keratoconus. We report herein the safety and efficacy of the surgery, the clinical results of three years, and the corneal confocal microscopy evolution of the cell density during one year of follow-up.

Setting

Lebanese university, Hadath-Lebanon. Division of Ophthalmology, Miguel Hernandez University, Alicante-Spain. Optica General, Saida-Lebanon, and Vissum Instituto Oftalmologico de Alicante. Grupo Miranza , Alicante, Spain.

Methods

Fourteen patients were randomly distributed into 3 experimental groups. Group-1 patients underwent implantation of autologous ADASCs. Group-2 patients received decellularized donor corneal stromal lamina. Group-3, patients received implantation of recellularized lamina with ADASCs. Implantation was performed in a femtosecond-assisted. 36 months of follow-up clinical data are presented. Besides, one-year follow-up of the cell density evolution, and morphological changes of implanted cells using confocal microscopy.

Results

three-year clinical outcomes were obtained in (G-1, G-2&G-3) regarding the preoperative mean values: An increase of 1-2 logMar lines with the UDVA, CDVA. We obtained a statistically significant increase in CCT, as well as in the Thinnest-point in G-2, and G-3 when compared to G-1.

A significant increase was observed in the cell density in the anterior and posterior corneal stroma with all the groups, and in the implanted laminas in G-2&G-3.

Conclusions

Intrastromal implantation of ADASCs and decellularized/ADASCs-recellularized human corneal stroma laminas did not have complications at 3 years in advanced keratoconus. The technique showed a moderate improvement in UDVA and CDVA and a significant increase in corneal thickness in the groups that received laminas. Using corneal confocal microscopy, we observed a significant increase in cell density up to one postoperative year at the corneal stroma following the implantation of ADASCs alone, and in those cases with implanted laminas.

Financial Disclosure of all authors

None.

Abstract #144

In Vivo Confocal Microscopy of corneal keratocytes, and Evaluation of Infiltrated Immune Cells in Corneal Stroma Treated with Cell Therapy in Advanced Keratoconus

M. El Zarif*[a], K. Abdul Jawad[b], JL. Alió[c]

[a] *LEBANESE UNIVERSITY, Saida, LEBANON ;* [b] *Optica General, Saida, LEBANON ;* [c] *Vissum Grupo Miranza, Alicante, SPAIN*

** Presenting author (monazarifaj@hotmail.com)*

Purpose

Recently we described a new surgical approach by regenerative medicine using autologous adipose-derived adult stem cells (ADASCs) and decellularized corneal tissue with advanced keratoconus. We report herein the in vivo confocal microscopy (IVCM) evolution of the injected ADASCs into the human cornea along one-year follow-up into keratocytes. Evolution of the corneal decellularized or ADASCs-recellularized human donor corneal laminas. As well the evaluation of immune cell (ICs) infiltration in the corneal stroma with advanced keratoconus.

Setting

Lebanese university, Hadath-Lebanon. Division of Ophthalmology, Miguel Hernández University, Alicante-Spain. Optica General, Saida-Lebanon, and Vissum Instituto Oftalmologico de Alicante. Grupo Miranza , Alicante, Spain.

Methods

IVCM was performed in an experimental, prospective consecutive series of cases. Fourteen patients were randomly distributed into 3 experimental groups. Group-1 patients underwent implantation of autologous ADASCs. Group-2 patients received decellularized donor corneal stromal lamina. Group-3, patients received implantation of the recellularized lamina with ADASCs. Implantation was performed in a femtosecond-assisted.

An original method of quantitative confocal microscope study cell counting was used. We also studied the morphological evolution of the implanted cells and the decellularized/recellularized laminas. As well we investigates the ICs infiltration at 1,3,6, and12 months post-transplant.

Results

A significant increase ($P<0.001$) was observed in the cellularity in the anterior and posterior stroma in (G-1,G-2&G-3) at one year/preoperative density level. Same result was obtained at the mid stroma in G-1, also at the anterior, posterior surfaces and within the laminas in G-2&G-3. The cell density in G-3 was statistically significantly higher than in G-2.

Infiltrated ICs, encompassing granulocytes and agranulocytes, were observed across all groups, categorized by luminosity, structure, and area. Stromal ICs infiltration had a consistent increase in group-related cell density, independent of post-op time.

Conclusions

IVCM is an essential tool for the assessment, and the follow-up of the corneas implanted with ADASCs for corneal regeneration purposes. We observed a significant increase in the cellularity of the corneal stroma following the implantation of ADASCs alone, as well with patients implanted with decellularized/recellularized laminas.

ADASCs-recellularized laminas therapy may lead to increased ICs infiltration compared to ADASCs alone, impacting cell distribution and size due to the presence of the lamina. The findings reveal intricate immune patterns shaped by the corneal microenvironment and highlight the importance of understanding immune responses for the development of future therapeutic strategies.

Financial Disclosure of all authors

None

Abstract #145

Clinical and Confocal Microscopy Outcomes in a Pioneer Experience of Regenerative Cell Therapy in Advanced Keratoconus: A Case Report

M. El Zarif*[a], K. Abdul Jawad[b], JL. Alió[c]

[a] *LEBANESE UNIVERSITY, Saida, LEBANON ;* [b] *Optica General, Saida, LEBANON ;* [c] *Vissum Grupo Miranza, Alicante, SPAIN*

** Presenting author (monazarifaj@hotmail.com)*

Purpose

To report the clinical outcomes in a new surgical approach based on advanced regenerative cell therapy, using autologous adipose-derived adult stem cells (ADASCs) in one case, and in another case received recellularized human corneal stromal laminas with ADASCs into corneal stroma with advanced keratoconus. Both patients presented paracentral scars in their corneas at the preoperative time. We report herein the safety and efficacy of the surgery, the clinical results of three years, and the confocal microscopy findings after 12 months.

Setting

Lebanese university, Hadath-Lebanon, Division of Ophthalmology, Miguel Hernandez University, Alicante-Spain. Optica General, Saida-Lebanon, and Vissum Instituto Oftalmologico de Alicante. Grupo Miranza , Alicante, Spain.

Report of case

Case-1, a 33-year-old female, underwent implantation of autologous ADASCs, and Case-2, a 34-year-old female received implantation of recellularized lamina with ADASCs. Implantation was performed in a femtosecond-assisted. 36 months of follow-up clinical data are obtained. Besides, the one-year follow-up of the cell density evolution, morphological changes of implanted ADASCs were investigated. Using confocal microscopy. The evolution of the pre-existing scars was evaluated using confocal microscopy, and slit lamp biomicroscopy. The clinical outcomes at three years regarding the preoperative values show an increase of 3.4, and 2.33 logMar lines with the UDVA, and the CDVA respectively with case-1. Meanwhile in Case-2, one, and two logMar lines with the UDVA, and the CDVA were obtained respectively. We noticed an increase significantly higher in the central corneal thickness (CCT), as well as in the Thinnest-point in Case-2 regarding Case-1.

Also, a significant increase was observed in the cell density in the anterior and posterior corneal stroma in both cases and the implanted laminas with Case-2. A noticeable, and gradual fading of the pre-existing scars was observed during the follow-up.

Conclusion/Take home message

Intrastromal implantation of ADASCs and ADASCs-recellularized human corneal stroma laminas did not have complications at 3 years in advanced keratoconus. The technique showed an improvement in UDVA and CDVA and a significant increase in corneal thickness in the patients who received corneal lamina. Using corneal confocal microscopy, we observed a significant increase in cell density up to one postoperative year at the corneal stroma following the implantation of ADASCs alone, and with implanted lamina. This technique could be useful to treat corneal scars.

Abstract #146

Long-term evaluation of PACK-CXL

A. Erler*[a], K. Makdoumi[a]

[a] *University Hospital Örebro, örebro, SWEDEN*

** Presenting author (anna.erler@regionorebrolan.se)*

Purpose

The aim of this prospective study was to analyze the long term outcome regarding corneal healing, visual rehabilitation, and safety of patients treated with a crosslinking procedure due to corneal infection (also termed PACK-CXL, Photo-Activated Chromophore for Keratitis-Collagen Crosslinking) after up to 13 years.

Setting

Prospective non-randomized clinical study, Department of Ophthalmology, Örebro University Hospital, Sweden.

Methods

The study was granted approval by the Swedish ethical review authority. Screening was done through the patient journal and registration system, by searching for all patients who underwent a crosslinking procedure with the ICD10 diagnosis keratitis, between the years 2007 and 2021. Those eligible to participate in the study were invited with prior informed consent to come for a thorough follow-up visit to assess the corneal status including visual acuity, intraocular pressure measurement, slit-lamp photography, corneal topography, pachymetry, optical coherence tomography, and endothelial cell count.

Results

In all eyes included in the study, the cornea had intact epithelium with a well-healed former infectious lesion. Depending on the original location, size, and severity of infection the final visual acuity differed corresponding to the remaining scarring. No adverse outcomes were seen related to the crosslinking procedure, such as general haze or corneal decompensation. All patients had an endothelial cell count better or comparable to the fellow untreated eye. None suffered of a reinfection. The procedure was effective in promoting corneal healing regardless of the cultured pathogen, which even included *Acanthamoeba castellanii*.

Conclusions

PACK-CXL is a safe procedure that contributes to healing with few side effects. In our patients, a heterogenous group of pathogens was identified, but all patients included in the follow-up benefited from the procedure. We saw no adverse events such as corneal decompensation or reinfection despite a long follow-up of up to 13 years. The scarring correlated to the original expansion of the lesion and was mostly mild. PACK-CXL seems to be safe even regarding long term results and complications. Hence, the results support PACK-CXL being integrated as a treatment modality in severe cases of keratitis and corneal melting.

Financial Disclosure of all authors

None

Abstract #147

Pachychoroid Pigment Epiteliopathy in patients affected with keratoconus: Assessing Prevalence and Correlations with Corneal and Chorioscleral Abnormalities

P. Forte[a], A. Feo[b], R. Manocchio*[a], L. Di Cello[a], M. Nicolo'[a], MR. Romano[b], C. Bonzano[a]

[a] *IRCCS Ospedale Policlinico San Martino, Eye Unit, Genoa, Italy, Genoa, ITALY ;* [b] *Department of Biomedical Sciences, Humanitas University, Via Rita Levi Montalcini 4, 20072 Pieve Emanuele-Milan, Italy, Milan, ITALY*

** Presenting author (riccardomanocchio@gmail.com)*

Purpose

To assess the prevalence of pachychoroid pigment epitheliopathy (PPE) in keratoconus (KC) patients and investigate its correlation with corneal, choroidal, and scleral indices.

Setting

Exploratory cross-sectional, cohort study, that comprised a total of 100 patients affected with KC screened for the presence of PPE. Data on demographic features, collagen cross-linking treatment (CXL), anamnestic records and clinical findings were collected. Exclusion criteria included history of corneal transplantation and exposure to previous and current steroid treatment.

Methods

Patients underwent a multimodal imaging assessment, including optical coherence tomography, corneal topography, corneal pachymetry, and axial length measurement. Measurement of anterior scleral stromal thickness was obtained in the horizontal gaze positions 6mm posteriorly to the scleral spur. Odds ratios (ORs) and corresponding 95% confidence limits (95%CL) were estimated through a logistic regression (LR) analysis to evaluate the association between each study biomarker and PPE. To accommodate for the potential clustering effect dye to within-patient correlated eye data, generalized estimating equations (GEE) procedure was applied to LR modelling.

Results

85 patients were analyzed (mean age=34.2 years, standard deviation=8.7). Prevalence of PPE was 10.5% (9/85 patients, 11/170 eyes, 2 bilateral cases). Significant predictors for PPE according to LRM were: choroidal thickness (OR =4 .51, 95%CL = 1.50/13.6, for 50µm increments, p = 0.007), age (OR = 4.61, 95%CL 1.30/16.4 for 10-year increments, p=0.018), and scleral thickness (OR = 7.48, 95%CL = 1.69/33.1, for 25µm increments, p = 0.008). Gender, axial length, corneal curvature and astigmatism did not show significant discriminant ability (p > 0.05). CXL treatment was performed in a comparable proportion between the two groups.

Conclusions

Our study identifies choroidal thickening, increased age, and scleral thickening as relevant predictors of PPE in KC patients. These findings provide deeper insights into the ocular characteristics associated with KC and PPE.

Financial Disclosure of all authors

PF,AF,RM,LC,MN,MRR,CB:There are no financial conflicts of interest to disclose

Abstract #148

Retrospective analysis of intra and postoperative complications of Keraring® and Ferrara® ring segment implantation

T. Garcin*[a], E. Pottier[a], O. Prisant[a]

[a] *CLINIQUE de la VISION, Paris, FRANCE*

** Presenting author (garcinthibaud@gmail.com)*

Purpose

To describe and analyze intra and postoperative complications of intracorneal ring segments (ICRS) implantation and reasons for explantation in a large monocentric series of 1594 eyes.

Setting

Clinique de la Vision, Paris

Methods

Monocentric retrospective study including 1594 eyes implanted with Keraring® or Ferrara® ICRS by the same surgeon (OP) between 2008 and 2023. For all procedures, the tunnel was performed using Intralase® femtosecond laser. We reported all intra and post-operative complications and all reasons for explantation. Bad refractive and visual outcomes without explantation were not included in this study.

Results

Over 15-year : Intraoperative complications included Descemet perforation due to the tunnel depth in 3 eyes (0.19%); Postoperative complications included infectious keratitis in 6 eyes (0.38%), major halos in 24 eyes (1.51%), decentration >1mm in 11 eyes (0.69%), stromal infiltrate near the incision due to too-close positioning of the ring in 25 eyes (1.57%). Rings had to be explanted in 25 eyes (1.57%) due to infectious keratitis in 5 eyes (0.31%), unbearable halos in 4 eyes (0.25%), major decentration in 1 eye (0.06%), extrusion in 13 eyes (0.82%) and bad visual outcomes in 2 eyes (0.13%).

Conclusions

Keraring® and Ferrara® ICRS implantation is a safe and effective procedure. In this large retrospective monocentric case series, intra and postoperative complications rate was low (4.32%) and the explantation rate was very low (1.57%).

Financial Disclosure of all authors

NONE

Abstract #149

Keratometry asymmetry amplitude (KAA), one parameter to access keratoconus severity.

N. Ghomashchi*[a], V. Saunier[a], D. Touboul[a]

[a] *BORDEAUX UNIVERSITY HOSPITAL, Bordeaux, FRANCE*

** Presenting author (n.ghomashchi@hotmail.fr)*

Purpose

The aim of this study is the simplification of keratoconus classification. In this landscape, we have developed and tested a new topographic parameter based on keratometric asymmetry, called KAA for Keratoconus Asymmetry Amplitude, using OCT topographer data.

Setting

This observational cohort study was conducted at a national keratoconus reference center.

Methods

We studied the axial topography of 282 consecutive eyes obtained with an OCT-topographer. The performance of the keratometric asymmetry amplitude (KAA) was evaluated using the Pearson correlation test.

Results

The keratometric asymmetry amplitude (KAA) is statistically highly associated with the main parameters known to be linked to keratoconus severity, especially maximal keratometry over 10 mm (p=0.8246, CI 95% [0.7823;0.8593]) and central simulated keratometry over 3 mm (p=0.7724, CI 95% [0.7194:0.81641]).

Conclusions

With this study, we introduce a new topographic parameter designed to assess keratoconus severity quickly, making it easily applicable in everyday practice. Anterior asymmetry proves to be a robust indicator of severity and an accurate measure of the visual difficulties caused by keratoconus deformation.
Our current objective is to evaluate the superiority of keratoconus asymmetry amplitude over other parameters commonly used to score keratoconus severity.

Financial Disclosure of all authors

No financial disclosure for all authors.

Abstract #150

The Role of Intracameral Air as an Adjunct for Predescemetal Sutures in Corneal Hydrops

CMS. Gruen*[a], LM. Hartmann[a], A. Wolf[a], CM. Wertheimer[a]

[a] *UNIVERSITY ULM, Ulm, GERMANY*

** Presenting author (claragruen@gmx.de)*

Purpose

The current standard treatment for corneal hydrops is predescemetal sutures combined with intracameral air injection. However, the use of intracameral air is associated with increased risks such as high ocular pressure or infection. The aim of this study was to investigate whether there is a difference in oedema resolution between sutures with and without the use of intracameral air.

Setting

This is a retrospective monocentric case series at a tertiary university-based clinical centre.

Methods

Between March 2020 and December 2023, nine patients with corneal hydrops (one with pellucid marginal degeneration and eight with keratoconus) were referred to our outpatient clinic. Five received sutures with intracameral air injection and four without. The primary endpoint of the study was the resolution of corneal oedema. Other factors recorded were visual acuity, complications and time of suture removal.

Results

Both groups, with and without intracameral air injection, showed resolution of oedema within a maximum of 55 days, followed by suture removal after a maximum of 108 days. No major complications were observed in either group. Visual acuity improved but remained at a low level in all cases.

Conclusions

In our small series, sutures without intracameral air showed comparable results to the descemtopexy with air. Avoiding air injection may help prevent risks such as high intraocular pressure or infection. Future studies will have to proof this potential before clinical use.

Financial Disclosure of all authors

Clara M. S. Gruen: None
Lennart M. Hartmann: None
Armin Wolf: Armin Wolf received research grants and study fees from Allergan, Boehringer Ingelheim, Bayer, Alimera, Novartis, Oertli and Roche and consulting honoraria and travel fees from Alimera, Allergan, Bayer, Boehringer Ingelheim, Novartis, Oertli, Roche and Zeiss. All of these are not connected to this study.
Christian M. Wertheimer: None

Abstract #151

Efficacy of Collagen cross linking with individualized fluence (Sub 400 protocol) in keratoconus patients with ultrathin cornea.

I. Gupta*[a], P. Jain[a], A. Hariani[a], G. Reddy[a], N. Trivedi[a]

[a] *GURU NANAK EYE CENTRE, Delhi, INDIA*

** Presenting author (gupta.isha1995@gmail.com)*

Purpose

To evaluate the efficacy of Collagen cross linking with individualized fluence (sub 400 protocol) in keratoconus patients with ultrathin cornea.

Setting

Prospective Interventional Study

Methods

A prospective interventional study was conducted in patients diagnosed with keratoconus with thinnest corneal thickness < 400µm. 25 eyes of patients who underwent collagen cross linking using sub 400 protocol were followed up for 6 months postoperatively and parameters like BSCVA, maximum keratometry, thinnest corneal pachymetry and demarcation line were evaluated.

Results

There was flattening of atleast 1 dioptre in maximum keratometry in most of the patients over 6 months with no case of progression noted. The depth of demarcation line measured on ASOCT was in range 200-250µm for most of the patients.

Conclusions

The management of keratoconus patients with ultrathin corneas (less than 400 um after epithelial debridement) remains a challenge and there is a paucity of literature on different protocols and techniques especially in the Indian population. This study evaluated the efficacy and safety of corneal collagen cross linking with individualized fluence (sub 400 protocol) in Indian population and found it to be efficacious in halting progression in keratoconus patients with thin corneas.

Financial Disclosure of all authors

Nil

Abstract #152

Spectrum of corneal infiltrates seen in paediatric patients after corneal collagen crosslinking.

I. Gupta*[a], P. Jain[a], A. Hariani[a], A. Mehta[a], G. Reddy[a], N. Trivedi[a]

[a] *GURU NANAK EYE CENTRE, Delhi, INDIA*

** Presenting author (gupta.isha1995@gmail.com)*

Purpose

To describe the spectrum of corneal infiltrates in paediatric patients after corneal collagen crosslinking.

Setting

Hospital based setting

Methods

Spectrum of corneal infiltrates in pediatric keratoconus after collagen cross linking (CXL) is heterogeneous. 14 patients in series of 100 (aged 10-15 years) presented 48 hours after procedure with redness, blurred vision. On examination, there was central corneal edema with infiltrates (in treatment zone) with variable involvement ranging from central involvement to pan-corneal involvement. All but one showed resolution of infiltrates with residual scarring after treatment with topical steroids. One patient had culture proven infective keratitis who responded to fortified antibiotics. Patients with sterile infiltrates had associated moderate to severe VKC, which at time of CXL was controlled.

Results

CXL in young patients of keratoconus with associated VKC is fraught with the possibility of sterile corneal infiltrates. Hence, it is important to ensure that it should be in the quiescent stage before resorting to CXL. CXL in children with VKC and keratoconus should be performed with extreme caution for the fear of sterile keratitis. Severe inflammation in the form of sterile infiltrates should be anticipated in such cases and managed.

Conclusions

Preventive measures before the procedure, during the procedure and after the procedure may have a significant impact on reducing the incidence of this complication in CXL.

Financial Disclosure of all authors

Nil

Abstract #153

Outcome of first 100 eyes of Bharat Protocol in keratoconus using the NIDEK CXIII equipped with CATz algorithm from the FinalFit software- retrospective comparison with Athens protocol

R. Jain*[a], N. Mohan[a]

[a] *NARAYAN DHRISHTI, Delhi, INDIA*

** Presenting author (DRRAJAT.OPHTH@GMAIL.COM)*

Purpose

Results of first 100 eyes of Bharat Protocol - topography-guided excimer laser ablation in conjunction with accelerated, high-fluence cross-linking in keratoconus using the NIDEK CXIII equipped with CATz algorithm from the FinalFit software and its comparison with the published historical data of Athens protocol

Setting

Retrospective case review of 100 eyes (72 patients) of stage 1-3 keratoconus who underwent the procedure was performed. Visual acuity and distortion-induced eye pain was recorded. Keratometry, pachymetry, lower and higher order aberrations, spherical aberrations and topographic cylinder were documented from by Scheimpflug imaging (Pentacam 70700: Oculus, Wetzlar, Germany).

Methods

Demographic and clinical data was recorded. Specific modifications in the methodology of current study like the method of epithelial removal, chosing the ablation zone, ablation profile, amount of ablation, etc were specifically noted. The data was tabulated and then compared with the published data of Athens protocol.

Results

At minimum follow-up of 6 months (6.7-14), there was significant improvement in UCVA ($P<0.00001$), BCVA ($P=0.0061$), decrease in Kmax ($P<0.0001$), Ksteep ($P<0.001$), Kflat ($P<0.001$), and pachymetry ($P<0.0001$). This was despite non-significant change in spherical equivalent (p=0.01) and the tomographic cylinder (p=0.28). Significant improvement was seen in distortion-induced eye pain (87/100 to 23/100; $P<0.00001$). Significant change was seen in RMS LOA (p<0.001), koma 90 (p=0.02) and spherical aberration (p=0.0089). A >2-line improvement in UCVA/BCVA was seen in 67/100 and 88/100 cases, respectively. Ectasia stabilized in all cases, no complications were seen. Data was similar to published Athens protocol.

Conclusions

Bharat Protocol was found to be as efficacious as the Athens protocol and hence the current study proves the non-inferiority of Bharat protocol vs the Athens protocol. Due to certain technical modifications and different options available with Nidek platform, we believe it is more efficacious than the Athens protocol. Prospective, randomised, comparative studies are however required to establish this.

Financial Disclosure of all authors

nil

Abstract #154

Femtosecond Laser Assisted Bowman Layer Implantation Combined with Corneal Crosslinking (FBI Xtra) for Advanced Progressive Keratoconus: 7 years follow-up.

V. Liarakos*[a], M. Alexaki[a], R. Tsopouridou[b], M. Douvali[a]

[a] *AKTINA OPHTHALMOLOGY CENTER, Athens, GREECE ;* [b] *EYE DAY CLINIC, Athens, GREECE*

** Presenting author (vsliarakos@gmail.com)*

Purpose

To evaluate long-term survival and efficiency of a combined surgical treatment (Femtosecond Laser Assisted Bowman Layer Implantation Combined with Corneal Crosslinking - FBI Xtra) for advanced progressive keratoconus.

Setting

AKTINA OPHTHALMOLOGY CENTER : Optical Coherence Tomography, Corneal Topography, Ray tracing aberrometry

EYE DAY CLINIC : Femtosecond Laser Assisted Bowman Layer Implantation Combined with Corneal Crosslinking

Report of case

A 21-year-old Caucasian male with advanced progressive keratoconus, intolerant to contact lenses and reluctant for DALK, with a maximum corneal curvature of 92.0D and thinnest corneal thickness of 147 microns, underwent FBI Xtra. An intrastromal dissection at a precise depth was created with a Femtosecond Laser device (Alcon Wavelight FS-200) and a donor Bowman layer was implanted using a modified manipulator. Riboflavin 0.1% was irrigated inside the pocket followed by ultraviolet (UV-A) irradiation (370nm; 3mW/cm2). No sutures were used. The patient was followed for 7 years with two different Anterior Segment Spectral Domain Optical Coherence Tomography devices (Solix and iVue, Optovue), Corneal Topography (Tomey, TMS-5) and Ray tracing Aberrometry (iTrace).

The dissection plane was uniform and smooth, at an equal depth. Direct intrastromal irrigation with riboflavin increased corneal thickness over 400 microns, allowing for UV crosslinking. The patient was able to return to his routine the next day with minor discomfort. Corneal thickness increased symmetrically by an average of 50 microns. Mean curvature was reduced from 70.0D to 66.5D within the first month. Epithelial map was normalized, allowing for contact lens fitting. The cornea remained transparent and stable 7 years after surgery without any complication. No rejection or opacification of the graft was noticed over the 7 years of follow up. Corneal pachymetry map and corneal topography remained stable over the follow-up period.

Conclusion/Take home message

Femtosecond Laser Assisted Bowman Layer Implantation combined with Corneal Crosslinking (FBI Xtra) seems to be a safe novel procedure that may achieve precise, uniform and predictable intrastromal implantation of a donor Bowman layer combined with securing the result with UV crosslinking. Results remain stable over 7 years.

Abstract #155

ENDOTHELIUM SPARING FEMTOLASER ASSISTED WEDGE RESECTION PLUS CORNEAL CROSSLINKING FOR THE TREATMENT OF PELLUCID MARGINAL DEGENERATION

F. Martini*[a], M. Tsatsos[b], M. Tavolato[a]

[a] CAMPOSAMPIERO HOSPITAL, AULSS 6 EUGANEA, Padova, ITALY ; [b] Ophthalmology Clinic, Aristotle University of Thessaloniki, Thessaloniki, GREECE

** Presenting author (ferdinando.martini@aulss6.veneto.it)*

Purpose

We describe the case of a patient affected by Pellucid Marginal Degeneration (PMD) treated with a femtolaser assisted endothelium sparing corneal wedge resection. PMD is a peripheral inferior corneal ectasia. Manual lamellar crescentic corneal resection or wedge resection is an effective surgical technique that can improve corneal shape. However, this treatment requires high surgical skills, it is associated with endothelium damage, risk of corneal perforations and poor postoperative refractive prediction. The rationale of our technique is to perform a partial thickness wedge resection with the precision of femtolaser in order to regularize the cornea avoiding the risk of corneal perforation.

Setting

The selected patient was treated at Ophthalmology Unit, Camposampiero Hospital, Padova, Italy. The femtolaser machine used was: Bausch and Lomb Victus femtolaser platform

Report of case

A 67-year-old man affected by PMD and cataract was selected for femtosecond laser wedge resection. Scheimpflug keratometric values of his right eye were: K1= +35,9 D, K2= +48,03 D, Ast= +12,95 D. Minimal corneal thickness was 480 microns. Best corrected visual acuity was 6/60 with a refraction of (-1,00 -7 axis 90°).

The femtolaser machine used has an integrated OCT that can measure corneal pachymetry intraoperatively and decide the depth of the cut in a very precise manner. The device doesn't have a specific program for wedge excision, so we created the wedge using two beveled corneal arcuate curve incisions.

The first outer cut was done at an optical zone of 9,5 mm with a depth: 80% thickness amplitude: 80°, side cut angle: 70°. The second inner cut was done with an optical zone of 9,2 mm same depth: 80% thickness amplitude: 80°, side cut angle: 110°.

After the two femtolaser incisions a corneal wedge of 0,3 mm was excised without any difficulties. The two free margins were sutured with a nylon 10 zero suture.

3 months later, we decided to stabilize the result with a localized accelerated collagen corneal cross linking (9 mW).

After 1 year corneal astigmatism remained stable and regular: 4,67D against the rule therefore, we decided to perform cataract surgery with IOL implantation in order to correct media opacities and all residual refractive errors.

Final postop corrected visual acuity was 60/60. The suture was left in place

Conclusion/Take home message

Femtolaser wedge resection plus corneal collagen crosslinking is a safe and effective treatment for PMD.

The procedure is a partial thickness procedure, therefore risks of perforation are very low.

The technique is easy, fast, and can be performed even also under topical anesthesia.

We have described a novel technique that can improve corneal shape in eyes affected by PMD, thus avoiding more invasive and risky procedures.

Abstract #156

Prevalence and associated factor with corneal ectatic disease in Thailand: a five year hospital-based retrospective study

P. Phrueksaudomchai*[a], M. Amorntipsakulf[b], C. Tharawan[b], W. Tattiyakul[c], P. Patarajierapun[d]

[a] *Thammasat University Hospital and Ophthalmology Department, faculty of medicine, Thammasat University, Pathumthani, THAILAND ;* [b] *THAMMASAT UNIVERSITY HOSPITAL, Pathumthani, THAILAND ;* [c] *Faculty of Medicine, THAMMASAT UNIVERSITY, Pathumthani, THAILAND ;* [d] *Chulabhorn International College of Medicine, THAMMASAT UNIVERSITY, Pathumthani, THAILAND*

** Presenting author (makorn273@gmail.com)*

Purpose

This study aimed to evaluate prevalence and associated factor with corneal ectatic disease in Tertiary-hospital based, Thailand.

Setting

Thammasat University Hospital, Thailand

Methods

This is a hospital-based retrospective cohort study. Medical records of patients between January 2019 to December 2023 were reviewed by ophthalmologist. The patients who were diagnosed by keratoconus, keratoconus suspected, Subclinical keratoconus, keratoglobus, pellucid marginal degeneration and corneal ectasia were included. Clinical evidence-based of diagnosis, age, gender, occupation, education, race, hometown, underlying, eye related disease, visual acuity, intraocular pressure, keratometric parameters and related risk factors were collected. The study was analyzed by prevalence, ratio, percentage, Pearson correlation and Anova.

Results

53,377 patients were joined in Ophthalmology clinic between 2019-2023. 68 patients who diagnosed with corneal ectatic disease were collected by including 64 patients with keratoconus (94%), 2 patients with pellucid marginal degeneration (3%) and 2 patients with corneal ectasia unspecific (3%). Overall prevalence of corneal ectatic disease is one per 785. The most common of eye related disease is allergic conjunctivitis (49/68:72%). For associated factors, The most common is eye rubbing (55/68:81%). Allergic rhinitis (23/68:34%), contact lens use (18/68:26%), obstructive sleep apnea (10/68:15%) and delay developmental (2/68:3%) were the next related risk factors respectively.

Conclusions

This study is the first report prevalence of corneal ectatic disease in tertiary-hospital based Thailand. Overall prevalence of corneal ectatic disease ratio is 0.001 or one per 785. The most common eye related disease and associated factor are allergic conjunctivitis and eye rubbing.

Financial Disclosure of all authors

no

Abstract #157

Intracorneal Ring Segment Implantation Followed by Same-day Topography-guided PRK and Cross-linking in 686 Keratoconic Eyes.

O. Prisant*[a], E. Pottier[a], T. Garcin[a]

[a] *Clinique de la Vision, Paris, FRANCE*

** Presenting author (oprisant@gmail.com)*

Purpose

Our study aimed to evaluate the efficacy and safety of intracorneal ring segment (ICRS) implantation followed, after refractive and keratometric stability, by same-day topography-guided PRK (TG-PRK) and cross-linking (CXL) for visual rehabilitation in keratoconic eyes.

Setting

Clinique de la Vision, Paris, France

Methods

All 686 consecutive keratoconic eyes included in this retrospective monocentric study underwent ICRS implantation followed, at least 3 months later, by same-day TG-PRK with CXL. All eyes were operated by the same surgeon (OP) and had a minimum of 3 months follow-up after the second procedure. All parameters including BCVA, UCVA, sphere, cylinder, spherical equivalent, corneal astigmatism and maximal keratometry (Kmax) using Orbscan and Pentacam, were measured pre-operatively, 3 months after ICRS implantation and 3 months after TG-PRK with CXL.

Results

BCVA improved from 0,3±0,16LogMAR preoperatively to 0,23±0,15 after ICRS implantation and to 0,14±0,14 after TG-PRK+CXL (all p<0,001). UCVA improved from 0,89±0,34LogMAR preoperatively to 0,58±0,35 after ICRS implantation and to 0,34±0,32 after TG-PRK+CXL (all p<0,001). Spherical equivalent decreased from -4,37±3D preoperatively to -2,2±2,5D after ICRS implantation and to -0,84±1,8D after TG-PRK+CXL (all p<0,001). Refractive cylinder decreased from -4,14±1,9D preoperatively to -1,92±1,2D after ICRS implantation and to -1,03±1,1D after TG-PRK+CXL (all p<0,001). Kmax (Pentacam) and corneal astigmatism decreased respectively from 55,63±5,2D preoperatively to 49,55±4,5D after TG-PRK+CXL and from 4,58±2,1D preoperatively to 1,96±1,2D after TG-PRK+CXL (all p<0,001).

Conclusions

ICRS implantation followed by same-day TG-PRK and CXL was found to be effective and safe for improving BCVA and reducing ametropia in patients with keratoconus.

Financial Disclosure of all authors

None

Abstract #158

Worldwide Analysis of Climate-Related Determinants of Keratoconus

H. Shabani*[a], J. De Ridder[a], MA. Asaad[b], MA. Meester-Smoor[a], CCW. Klaver[a], WD. Ramdas[a], BTH. Van Dooren[a]

[a] *ERASMUS MEDICAL CENTER, Rotterdam, NETHERLANDS ;* [b] *Bochum University Eye Hospital, Bochum, GERMANY*

** Presenting author (h.shabani.md@gmail.com)*

Purpose

The reported prevalence of keratoconus varies widely worldwide, and the factors contributing to this variation are not well understood yet. This study explores the potential impact of relevant climate-related variables on keratoconus prevalence.

Setting

A worldwide analysis of keratoconus prevalence and how it relates to selected climate variables.

Methods

We systematically reviewed studies about keratoconus prevalence in the general population. Climate variables were extracted using state-of-the-art methods; gridded climate datasets such as the ERA5 and its derivatives were utilized to find climate data for each studied region. Moreover, population density weighting was applied to enhance exposure accuracy. We considered the 10 years preceding data collection of each prevalence study the climate exposure period. Over this period, the averages of relative humidity, wind speed, ultraviolet radiation, and maximum daily temperature were calculated. Finally, the potential impact of these climate variables on prevalence was investigated using multivariable linear regression.

Results

Eight studies including data from 58 different areas were identified in the systematic review and deemed eligible for the quantitative analysis. Preliminary simple linear regression resulted in the exclusion of maximum daily temperature (P= 0.158). The remaining climate variables were included in a multivariable regression model, which showed a negative association between humidity and the natural logarithm of keratoconus prevalence (Beta= -0.035, 95% CI: -0.064 to -0.007, P= 0.015). Lower humidity might therefore be a risk factor for keratoconus. In contrast, maximum daily temperature, wind speed, and UV radiation did not show significant associations with keratoconus prevalence.

Conclusions

Low humidity emerged as an unexplored environmental risk factor for keratoconus, while the other climate variables did not seem to pose significant risk. Future research is needed to confirm the role of low humidity in the pathogenesis of keratoconus, and to assess the potential therapeutic and preventive benefits of humidification.

Financial Disclosure of all authors

None to declare.

Abstract #159

Features of the course and treatment of progressive keratoconus in military personnel.

L. Troichenko*[a], G. Drozhzhyna[a]

[a] *SI " THE FILATOV INSTITUTE OF EYE DISEASES AND TISSUE THERAPY NAMS OF UKRAINE", Odessa, UKRAINE*

** Presenting author (tlf2008@ukr.net)*

Purpose

To evaluate the course and treatment of progressive keratoconus in military personnel

Setting

The study conducted in SI " The Filatov Institute of Eye Diseases and Tissue Therapy NAMS of Ukraine"

Methods

There were 19 military patients (MP) (26 eyes) with progressive keratoconus under our observation and treatment. In 2022, 5 eyes (19.2%) were treated, and in 2023, 21 eyes (80.7%) were treated. The age of the patients was 32.4±6.34 years (ranging from 19 to 45 years); one woman and 18 men. The causes of keratoconus (KC) progression were visual strain and constant eye rubbing in 5 patients (26.3%), and additional physical exertion in 14 patients (73.7%). KC stages: II - in 3 eyes (11.5%), III - in 21 eyes (80.7%), IV - in 2 eyes (7.7%).

Results

In the IV stage of the KC (2 eyes) the penetrating keratoplasty was carried out with improving of VA to 0.4. The accelerated CLX was performed on 24 eyes (II and III stages of KC). In 2022, 65 CLX were conducted with 5 (7.7%) MP. In 2023 - 100 CLX, including 19 (19%) of MP. After 6 months: BCVA increased by 0,1 to 0,55±0.35, p=0,16; The corneal thickness was no significant decrease 447±35.4 nm, p=0,5; The degree of astigmatism decreased by 0.67 to 2.77±1.35, p=0,12;The maximum keratometry decreased by 3.62 D to 52.8±6.26 D, p=0,12.

Conclusions

Among military personnel with KC, patients with stage 3 KC predominated (80.7%). The main surgical intervention was CLX, which increased from 7.7% in 2022 to 19% in 2023. Physical exertion and stress experienced by military personnel with KC can serve as triggers for disease progression. It is advisable to conduct investigations into corneal biomechanics and pachymetry (Pentacam) for monitoring the dynamics of development and timely implementation of corneal CLX to halt the progression of KC and preserve vision in military personnel.

Financial Disclosure of all authors

No Financial Disclosure of all authors

Lens and Corneal Refractive Surgery: Corneal Complications

Abstract #160

Cataract Surgery in Patients with Severe Corneal Opacities

E. Akbas Ulman*[a], O. Barut Selver[a]

[a] *EGE UNIVERSITY, Izmir, TURKEY*

** Presenting author (elifakbas93@gmail.com)*

Purpose

Investigation of the effectiveness and safety of phacoemulsification and intraocular lens (IOL) implantation in severe corneal opacities.

Setting

The medical data of patients who have cataract coexistent with severe corneal opacity and underwent phacoemulsification surgery at a referral center between January 2020 and September 2023 were evaluated retrospectively.

Methods

The refractive error, best corrected visual acuities (BCVA) and severity of corneal opacity were investigated. Severity of corneal opacity was graded according to slit-lamp examination classification system. Only patients with grade 3 opacity (severely dense opacity obscuring the details of the intraocular structure) and for whom corneal transplantation was not planned due to the high probable of graft failure and rejection reaction or difficult post-transplant care were included to the study. Patients with neurological diseases that could cause central vision loss or previously known retinal pathology were excluded.

Results

Eleven patients (5F/6M) with a mean age of 61.0±17.2 years were included. The most common cause of corneal opacity was herpetic keratitis, followed by chemical injury. The mean follow-up time after cataract surgery was 5.2±3.3 months. Complications were corneal edema which improved with hyperosmotic drops (n=3) and posterior capsule rupture (n=3). 1 patient underwent scleral fixation IOL implantation due to absence of capsule support, and 1 patient underwent corneal suturing due to leakage from the incision. The increase in BCVA from 2.14±0.88 to 0.81±0.40 LogMAR after the operation was significant (p=0.03).

Conclusions

As a result, although phacoemulsification is not an alternative to keratoplasty, it is a safe and applicable method in elderly or debilitated patients who are not transplant candidates and cannot comply with post-keratoplasty follow-up protocols. It is also effective as a procedure that allows visual recovery during transplantation in cases of donor shortage.

Financial Disclosure of all authors

Financial Disclosure of All Authors: None

Abstract #161

A Comparative Prospective Cohort Study to Evaluate the Effect of Intraoperative Intracameral Cefuroxime on Corneal Endothelial Cell Count and Morphology Following Phacoemulsification Surgery

Y. Busool Abu Eta*[a]

[a] *TZAFON MEDICAL CENTER, Tiberias, ISRAEL*

** Presenting author (yumna.busool@gmail.com)*

Purpose

To evaluate the effect of intracameral Cefuroxime, delivered at the conclusion of cataract operation, on the density, morphology and function of corneal endothelial cells.

Setting

A comparative prospective cohort study conducted at Tzafon Medical Centre, between November 2021 and November 2023. Patients were categorized into two comparative groups: Cefuroxime group and non-Cefuroxime group (due to known allergy). Baseline Endothelial cell parameters were obtained and compared to 3 post-operative measurements within and between the groups.

Methods

A prospective cohort study that examined the effect of intracameral Cefuroxime on corneal Endothelial cell parameters. Data collected included: demographic information, medical history, pre-operative and post-operative endothelial cell density (CD), coefficient of variance (CV), percentage of hexagonal cells (HEX) and central corneal thickness (CCT), obtained 1 week, 1 month and 3 months following phacoemulsification surgery.

Results

In total, 59 patients were enrolled in the study, 30 patients in the Cefuroxime group and 29 in the control group. At baseline, CD, CV, HEX and CCT were comparable for both groups. Overall, compared to baseline, there was a statistically significant decrease in CD at 1 week, 1- and 3-months post-op, and in HEX at 1 week and 1 month ($p<0.001$). CCT showed significant reduction at 3 months compared to 1 week follow up ($P=0.027$). Linear mixed models were applied to investigate group differences and demonstrated comparable outcomes in all parameters at all post-op follow up points.

Conclusions

Corneal endothelial cell alterations observed following cataract phacoemulsification surgery are similar for patients receiving intracameral Cefuroxime compared to a control group. This is the first comparative prospective study to confirm the safety of intracameral Cefuroxime delivered during phacoemulsification surgery.

Financial Disclosure of all authors

The authors declare that they received no financial support for this study.

Abstract #162

Erroneous Corneal Intrastromal Intraocular Lens Implantation during Cataract Surgery: A Case Report

F. Cukurova*[a], E. Altinkurt[b], S. Cakmak[b]

[a] *MARDIN TRAINING AND RESEARCH HOSPITAL, Istanbul, TURKEY ;* [b] *ISTANBUL UNIVERSITY ISTANBUL MEDICAL FACULTY, Istanbul, TURKEY*

** Presenting author (feyzacukurova143@gmail.com)*

Purpose

To report an unusual but important complication of routine cataract surgery, intrastromal intraocular lens (IOL) implantation by accident.

Setting

University Hospital

Report of case

During the cataract surgery of a 66-year-old man, the IOL was delivered into the intrastromal space of the cornea accidentally which was removed immediately and carefully by enlarging the corneal tunnel. Anterior Segment Optic Coherence Topography (AS-OCT) was used for postoperative follow-up of the patient which showed a viscoelastic substance in the stroma of the cornea then it was intervened to wash it out. Our patient's final visual acuity was 20/20.

Conclusion/Take home message

We wish to emphasize that a uniplanar corneal incision with wound-assisted IOL insertion can lead to intrastromal IOL injection. If a cataract surgeon encounters such a complication, AS-OCT could be a useful imaging technique for follow-up.

Abstract #163

Lifting and repositioning of a Lasik flap presenting a post-traumatic full thickness defect, fifteen years following refractive surgery

ML. Dari*[a], D. Bertschinger[b], A. Bodson[c], K. Hashemi[a]

[a] *Hopital Ophtalmique Jules Gonin, Lausanne, SWITZERLAND ;* [b] *Centre Neuchatelois d'Ophtalmologie, Neuchatel, SWITZERLAND ;* [c] *Grant-Pont Ophtalmologie, Lausanne, SWITZERLAND*

** Presenting author (dari.ml@hotmail.com)*

Purpose

To report an unusual case of flap trauma fifteen years following Lasik. A fifty-six-year-old male patient who suffered ocular trauma of his left eye that led to a full-thickness defect of the Lasik flap, interface debris and epithelial ingrowth, required surgical debridement and repositioning of the flap, which was performed four months following the initial injury. Uncorrected distance visual acuity improved from 0.5 pre-operatively to 1.25 and on corneal topography, astigmatism progressed from irregular to regular against the rule astigmatism.

Setting

Cornea, Refractive and External eye disease Unit, Hôpital Ophtalmique Jules Gonin, Lausanne, Switzerland

Report of case

A 56-year-old patient who underwent bilateral Lasik surgery for myopia correction in 2005, sustained an ocular injury while on holidays abroad, after falling on the grass and injuring his left eye. He sought medical attention locally and was diagnosed with a paracentral flap defect and infiltrates underneath the flap. He was treated with topical besifloxacin, Diflucan and Oxytetracycline ointment and 3 days later, a steroid drop of loteprednol was introduced. Following the initial assessment, he was referred to an anterior segment unit and epithelial ingrowth was noted underneath the flap. During the 1 month follow up overseas, loteprednol was continued and autologous serum was added to the treatment regime and evolution of the epithelial ingrowth was described as favourable.

The patient was referred to our department three months following the injury by his ophthalmologist. Due to the persistent complaint of blurry vision, presence of interface debris, epithelial ingrowth and a defect on the flap, the decision to proceed with a surgical debridement and repositioning of the Lasik flap was taken. Surgery was uneventful without extension of the defect. Post-operatively the patient developed a paracentrally located interface fibrosis, which induced an irregular astigmatism that caused blurry vision and monocular diplopia. Treatment consisted of topical steroids and lubricating drops. Over a period of 24 months, the fibrosis gradually decreased and uncorrected distance visual acuity improved from 0.32 immediate post-operatively, to 1.25, and astigmatism on corneal topography evolved from irregular to regular against the rule astigmatism. During the last follow up, relapse of epithelial ingrowth associated with blurry vision was noted. The Lasik flap was well positioned without any folds. A trial of scleral lens was inconclusive due to difficulty in manipulation. Since the patient was not keen on using any visual aids, stromal puncture over the ingrowth allowed exit of some epithelium.

Conclusion/Take home message

A 15-year-old LASIK flap can be successfully lifted even in the presence of a full thickness hole and prior interface infiltrate. Reattachment may be associated with intensive fibrosis which improves gradually over many months. In this case, the patient suffered a sharp injury that led to a full-thickness hole, interface infiltrate, retention of debris and epithelial ingrowth. Surgical debridement is essential in order to arrest the progression of epithelial ingrowth and optimize the visual outcome by reducing irregular astigmatism. A thorough discussion regarding the length of time to visual recuperation is essential.

Abstract #164

Partial amputation of a LASIK Flap caused by blunt trauma with underlying full-thickness corneal injury

L. Fernández García*[a], P. Boned Fustel[a], M. Hurtado Sarrió[a]

[a] *Hospital Universitario y Politécnico La Fe, Valencia, SPAIN*

** Presenting author (larfergar@gmail.com)*

Purpose

To describe a clinical case of a 34-year-old female with a traumatic partial amputation of a laser-assisted in situ keratomileusis flap and an underlying penetrating corneal wound, and also to review current trends in management of LASIK flap complications

Setting

A third level, referral hospital in the city of Valencia (Spain)

Report of case

A 34-year-old female with history of LASIK surgery on both eyes 8 years prior presented to our emergency clinic after a blunt trauma with a ruler in her left eye. Visual acuity was slightly diminished in the injured eye. Corneal examination revealed a traumatic amputation of the lower third of the LASIK flap and an underlying deep and linear corneal wound. The surrounding corneal surface was edematous and slightly opaque, with debris present in the interface between the flap and the stroma suggesting the appearance of epithelial ingrowth. The rest of the corneal flap was clear and well-positioned. Spontaneous Seidel sign was negative but positive when pressure was applied. Anterior chamber was formed with no cellularity and IOP was 15 mmHg. Upon anterior segment OCT (CASIA2, Tomey, Nürnberg, Germany) a full thickness linear corneal penetrating wound and a loss of the inferior part of the flap were demonstrated.

A conservative approach was preferred in this case. A therapeutic contact lens was applied and treatment with topical ciprofloxacin and atropine was initiated. Days after a layer of epithelium started to cover the exposed stromal area and the penetrating wound sealed without the need for corneal sutures. Debridement of the surrounding epithelial ingrowth was postponed. Months after visual acuity in the left eye has been restored and irregular astigmatism has disappeared.

Conclusion/Take home message

According to the literature, late-onset traumatic flap complications can happen at any time after LASIK and can be caused by various types of injuries. Flap dislocation, subluxation or amputation should be considered as an emergency, and if managed appropriately, patients can still recover excellent visual results. Suturing the flap to the corneal stroma may be necessary at times to secure the flap in place, but is not mandatory. In our case, as the affected flap segment was already lost and the rest of the flap was well-positioned, a conservative approach with the use of a contact lens was sufficient. As a take home message, this complication shows the weak adhesions between the flap and the stromal bed even years after surgery, and the inherent risk of traumatic dislocation or amputation which needs to be explained to the patient.

Financial disclosure: None

Abstract #165

Cyclosporine-A drops for post-LASIK epithelial ingrowth

V. Liarakos*[a], M. Alexaki[a], M. Kafataris[a], M. Douvali[a]

[a] *AKTINA OPHTHALMOLOGY CENTER, Athens, GREECE*

** Presenting author (vsliarakos@gmail.com)*

Purpose

To evaluate the efficiency of topical Cyclosporine-A as a conservative medical treatment for Grade 3 post-LASIK epithelial ingrowth.

Setting

AKTINA OPHTHALMOLOGY CENTER : Anterior Segment Optical Coherence Tomography, Ray tracing Aberrometry, Corneal Topography, Slit Lamp imaging.

Methods

A 44-year-old male patient presented with persistent recurrent Grade 3 epithelial ingrowth after LASIK retreatment. The patient had already received unsuccessful Nd-YAG LASER alongside with topical steroid treatment and he was reluctant to an additional surgical intervention. Topical instillation of Cyclosporine-A 0.2% drops was used over a period of two years. Two separate Anterior Segment OCT devices (one Swept Source and one Spectral Domain), Ray tracing Aberrometry, Corneal Topography and Slit Lamp imaging were used at follow up.

Results

Epithelial ingrowth expansion was halted already in the first 3 months. Recession was evident after the first 6 months and continued for the following 2 years. Treatment was discontinued without recurrence with a follow up of an additional 7 years. OCT scans confirm gradual thinning of the fibrotic tissue. The epithelial map was normalized, topographical and tomographical irregularities were reduced and ray tracing aberrations were minimized after 2 years of treatment.

Conclusions

Prolonged topical treatment with Cyclosporine-A may prove efficient in persistent recurrent post LASIK epithelial ingrowth.

Financial Disclosure of all authors

NONE

Abstract #166

Regenerative capacity of intracameral e-PRP plasma for Pseudophakic Bullous Keratopathy: A case report

A. Syla Lokaj*[a]

[a] *UNIVERISTY CENTER CLINIC OF KOSOVA, Prishtina, ALBANIA*

** Presenting author (anitasylaj@live.com)*

Purpose

Purpose: To present successful management of moderate corneal edema following cataract surgery by using and intracameral application of eye platelet-rich plasma (E-PRP) in a case pseudophakic bullos keratopathy.

Setting

University Center Clinic of Kosova,Eye Clinic

Report of case

Methods: A 44-year-old-male presented to theour clinic with diminution of vision in the right eye for 1 year ago which was associated with intermittent photophobia and colored haloes around lights, especially on waking up in the morning. The patient did cataract surgery ten years ago.We use AS-OCT, slit lamp and corneal pachymetry that showing multiple small sub-epithelial micro and macro bullae involving whole cornea, diffuse stromal edema and mild Descemet's membrane thickening with folds. We give 0.3 ml of e-PRP intracameral in sterile condition.

Results: Different medical treatment using a lot of drops have failed. A sterile 0.3 mL of E-PRP was injected into the anterior chamber every 2 weeks for 1 month. Clinical and anatomical improvement began from the first first week, and corneal edema resolved at 2 months. Postoperatively, no significant side effect was noted. We followed by Slit lamp, Anterior segment-OCT and corneal pachymetry that they showed improvement of corneal transparence and total disappearance of fluid in the cystic superficial epithelium. The patient is in follow-up procedure.

Conclusion/Take home message

Conclussion: It can be concluded from this study that the therapeutic response with intracameral injection of PRP was actually satisfactory in moderate pseduphakic bullos keratopathy. In this case, intraocular E-PRP was a promising, apparently safe, and effective treatment option in management of bullos keratopathy, in which conventional approaches failed.

Abstract #167

An atypical presentation of bilateral diffuse lamellar keratitis after the femto-LASIK

W. Tangpagasit[a], K. Klanarongran[b], A. Watcharapanjamart[a], P. Thanakroekkiat*[a]

[a] *Thammasat hospital, Pathum Thani, THAILAND ;* [b] *Rajavithi Hospital, Bangkok, THAILAND*

** Presenting author (popoiily@hotmail.com)*

Purpose

The objective of this case report was to delineate the clinical presentation of a patient exhibiting bilateral diffuse lamellar keratitis (DLK) subsequent to undergoing the femto-LASIK procedure, alongside elucidating optimal management strategies encompassing both early diagnosis and treatment modalities.

Setting

The study was conducted at the Department of Ophthalmology, Faculty of Medicine, Thammasat University in Pathum Thani, Thailand.

Report of case

A 29-year-old Thai female visited the Ophthalmology Department of Thammasat University Hospital after undergoing femto-LASIK surgery. Following the procedure, she was prescribed topical medications, including 0.5% Moxifloxacin and 0.1% Dexamethasone, administered four times daily, alongside hourly artificial tears. On the first day post-surgery, the patient reported initial discomfort, with uncorrected visual acuity of 20/30-2 in the right eye and 20/20 in the left eye. A detailed slit-lamp examination revealed localized whitish infiltration within the corneal interface at the flap's edge in the right eye (fig.1A), leading to the adjunctive administration of 1.5% Levofloxacin eyedrops at hourly intervals.

By the second postoperative day, the patient achieved 20/20 visual acuity in both eyes. Subsequently, the right eye exhibited a mild decrease in whitish haze along the inferotemporal flap edge (fig.1B), while the left eye presented a faint haze at the inferonasal flap edge (fig.1D), suggestive of bilateral diffuse lamellar keratitis. Treatment involved hourly administration of 1% Prednisolone acetate eyedrops in both eyes every two hours, alongside hourly application of 1.5% Levofloxacin eyedrops bilaterally.

Progressive improvement was observed on the fifth postoperative day, with the patient achieving uncorrected visual acuity of 20/15 in both eyes and diminished corneal interface haze in the right eye, while complete resolution of haze was noted in the left eye. Sequential modifications in the medication regimen followed, including a reduction in the frequency of 0.1% Dexamethasone eyedrops, transitioning to every four hours for one day followed by four times daily in both eyes.

During the one-month postoperative follow-up, the patient's visual acuity remained favorable, measuring 20/15 in the right eye and 20/20 in the left eye. Autorefraction revealed minor refractive adjustments, while slit-lamp examination confirmed the complete resolution of infiltration, with minimal punctate epithelial erosion observed in both eyes

Conclusion/Take home message

Diffuse lamellar keratitis (DLK) may manifest due to a spectrum of etiologies, encompassing both endogenous and exogenous factors. Notably, endogenous instigators such as intraoperative bleeding can precipitate DLK, while exogenous provocateurs, exemplified by the utilization of sterile instruments during surgical procedures, are also implicated. In the context of the present case, the genesis of DLK is conjectured to potentially stem from exogenous origins, including the application of markers or polyvinyl alcohol (PVA) sponge spears.

In conclusion, DLK represents an infrequent complication after femto-LASIK. It should resolve without sequelae if promptly diagnosed and treated. High-dose topical steroids, topical antibiotic therapy, and lubricant eye drop could promote corneal healing, without necessity of corneal flap lifting.

Abstract #168

Performing Lamellar Keratectomy with Femtosecond Laser in Eyes with Visually Significant Corneal Stromal Dystrophies

J. Tran*[a], K. Hatch[a], N. Venkateswaran[a]

[a] *MASS EYE & EAR, Boston, UNITED STATES*

** Presenting author (jennanntran@gmail.com)*

Purpose

To describe three cases of patients with visually significant corneal stromal dystrophies treated with lamellar keratectomy (LK) via femtosecond (FS) laser.

Setting

Three eyes of three patients with visually significant corneal dystrophies (two with granular dystrophy, one with Avellino dystrophy) treated via LK with FS laser at a single academic institution.

Report of case

We describe a 60-year-old female patient with a history of granular dystrophy in both eyes status post penetrating keratoplasty in the left eye and three phototherapeutic keratectomies (PTKs) in the right eye, who presented with recurrence of stromal opacities, worse in the right eye. Her pre-operative uncorrected visual acuity (VA) in the right eye was 20/80 with pinhole improvement (PHI) 20/50. The central corneal thickness (CCT) was 576mm. She underwent LK via FS laser in the right eye with the creation of a 7.5mm flap of 170mm depth with mitomycin C (MMC) application for two minutes. At post-operative month four, her uncorrected VA improved to 20/50 with PHI 20/40. The second patient, a 55-year-old male, also had granular dystrophy that was visually worse in the right eye compared to the left eye, and he had been treated once with PTK in the right eye with eventual recurrence of stromal opacities. His pre-operative corrected distance VA in the right eye was 20/200 with PHI to 20/100. His CCT was 539mm. He subsequently underwent the same treatment as the first patient described above with a 150mm depth flap. At his post-operative visit three months later, his best-corrected VA was measured to be 20/70. The third case, a 76-year-old female, presented with a history of Avellino dystrophy in both eyes without prior treatments. She reported decreased vision of the left eye. Her pre-operative corrected distance VA was 20/100 with PHI to 20/100. CCT was 579 mm. Given the depth of her stromal opacities, she underwent a combined LK via FS laser with a 200mm depth flap along with PTK and MMC application. Two months later, her best-corrected VA was 20/150 with PHI 20/70. All three patients had decreased amounts of anterior stromal opacities and reported subjectively improved visual quality.

Conclusion/Take home message

Stromal corneal dystrophies often result in recurrent anterior stromal opacities that lead to visual impairment. Common treatments include multiple rounds of PTK or deep lamellar or penetrating keratoplasties. LK via FS laser is a useful technique for reducing stromal opacities and improving visual quality in these eyes with adequate corneal thickness, especially when managing eyes that exhibit recurrence. Advantages of this technique include creation of a refractively neutral planar flap with minimal induction of additional refractive error. In addition, if successful, this technique can delay the need for a keratoplasty with its associated risks of rejection and recurrence of opacities in the graft. Long-term follow-up of these patients to assess for recurrence of opacities is needed; patients need to be counseled about the need for glasses or hard contact lenses for best vision correction.

Abstract #169

LATE-ONSET INTERFACE FLUID AFTER UNEVENTFUL LASIK IN A PATIENT WITH IRIDOCORNEAL ENDOTHELIAL SYNDROME: FIRST REPORT IN THE LITERATURE

A. Tzamalis*[a], S. Basiakos[a], M. Samouilidou[a], N. Ziakas[a]

[a] *ARISTOTLE UNIVERSITY OF THESSALONIKI, Thessaloniki, GREECE*

** Presenting author (argyriostzamalis@yahoo.com)*

Purpose

To report a very rare case of interface fluid syndrome occurring 15 years after uneventful LASIK in a patient with Iridocorneal Endothelial Syndrome (ICE).

Setting

2nd Department of Ophthalmology, Aristotle University of Thessaloniki, Papageorgiou General Hospital, Thessaloniki, Greece

Report of case

A 49-year-old female was referred to the cornea clinics complaining about blurry vision in her left eye during the last year. The patient had undergone uneventful Femto-LASIK in both eyes fifteen years ago. Upon examination, best corrected visual acuity (BCVA) was 20/20 in her right eye and 20/200 in her left eye, while intraocular pressure measured with Goldmann applanation tonometry and Corvis was normal in both eyes (14mmHg OU). The biomicroscopy revealed a slightly edematous cornea in the left eye as well as corectopia with ectropion uveae, segmental iris atrophy and mild nuclear sclerosis, while the examination was uneventful in the right eye. The patient underwent specular microscopy which demonstrated endothelial cells with loss of the typical hexagonal corneal endothelium shape, pleomorphic appearance, and "light-dark reversal". The anterior segment OCT showed an accumulation of fluid in the interface, which regressed after the administration of topical steroids and hypertonic saline solution for 2 weeks. BCVA improved but remained at 20/60 due to a persistent subtle corneal edema and a mild corneal ectasia.

Conclusion/Take home message

Although rare, ICE may be the cause of interface fluid syndrome even years after uneventful LASIK surgery. Therefore, its prompt diagnosis and management could be crucial, especially in refractive surgery patients.

Abstract #170

Contrast sensitivity after corneal refractive surgery

C. Wertheimer*[a], F. Boemer[a], A. Wolf[a], L. Hartmann[a]

[a] *UNIVERSITY OF ULM, Ulm, GERMANY*

** Presenting author (cwertheimer@posteo.de)*

Purpose

Visual acuity is widely regarded as the standard for assessing vision after corneal refractive surgery and is often normal. Contrast sensitivity instead refers to the ability to detect or discriminate low-contrast gratings. Reduced contrast sensitivity, particularly in conjunction with glare sensitivity, can be more psychologically distressing than the loss of visual acuity. This may result in difficulties with tasks such as night-time driving or certain professions. This retrospective monocentric study aims to evaluate the role of contrast sensitivity after corneal refractive surgery and attempts to correlate different Scheimpflug imaging findings with contrast sensitivity in glare mode.

Setting

This is a retrospective monocentric study at a tertiary university-based clinical centre.

Methods

The study included 91 patients who had undergone corneal refractive surgery, with a total of 182 eyes. In addition to a clinical examination, binocular contrast sensitivity testing was conducted in glare mode using a Nyctometer (from Rodenstock). The root mean squared corneal higher order aberrations (RMS HOA 4 mm) from corneal tomography (OCULUS Pentacam) were correlated with the binocular contrast sensitivity.

Results

Only one eye had a visual acuity worse than 0.1 log (MAR), while the other 181 eyes had better visual acuity. In comparison, 75 (82%) patients had normal binocular contrast sensitivity in glare mode, defined as 32% contrast sensitivity after Weber, while 16 patients (18%) had worse contrast sensitivity. Patients with normal binocular contrast sensitivity had significantly lower corneal higher order aberrations in the eye with the lower 4-mm RMS HOA ($p = 0.03$).

Conclusions

This study demonstrates that, despite normal visual acuity, corneal refractive surgery can result in reduced binocular contrast sensitivity in nearly one fifth of patients. Additionally, the study found that increased corneal higher order aberrations in the eye with lower aberrations are correlated with reduced contrast sensitivity in glare mode. Further research is needed to determine the implications of these findings, particularly in the context of refractive correction surgery.

Financial Disclosure of all authors

Christian M. Wertheimer: None

Franziska Boemer: None

Armin Wolf: Armin Wolf received research grants and study fees from Allergan, Boehringer Ingelheim, Bayer, Alimera, Novartis, Oertli and Roche and consulting honoraria and travel fees from Alimera, Allergan, Bayer, Boehringer Ingelheim, Novartis, Oertli, Roche and Zeiss. All of these are not connected to this study.

Lennart M. Hartmann: None

Ocular Surface
&
Tear Film

Abstract #171

Normative Data on Pediatric Age Corneal Sensitivity

P. Akcay*[a], O. Barut Selver[a]

[a] *EGE UNIVERSITY, DEPARTMENT OF OPHTHALMOLOGY, Izmir, TURKEY*

** Presenting author (pa-1995@hotmail.com)*

Purpose

The aim of this study is to define normative data of corneal sensitivity in the childhood age group, which has no data in the literature.

Setting

The right eyes of children aged 5-18, who did not have any other ocular pathology and were brought to the outpatient clinic of Ege University for refractive error control, were included in the study. So far, measurements of 130 eyes of 130 children have been completed.

Methods

In this cross-sectional study, corneal sensitivity of the center of the cornea and four corneal regions (nasal, inferior, temporal, and superior) 2.0 mm away from the limbus was measured using a Cochet-Bonnet esthesiometer. Patients with systemic or ocular diseases such as diabetes mellitus, ocular surface pathology, contact lens use history, or dry eye disease were excluded from the study.

Results

The mean age was 11.29±4.6, with an 62/68 female/male ratio. The mean corneal sensitivity values of the central cornea and corneal regions (superior, inferior, temporal, nasal) were 5.20±0.46, 5.17±0.47, 5.17±0.48, 5.19±0.5, 5.18±0.46 g/mm^2 retrospectively. There was no statistically significant difference in corneal sensitivity both between quadrants and genders. Clinically significant refractive error was defined as spherical equivalent of -1.00D or less for myopia and +2.00D or more for hyperopia. The refractive error in all patients was below the defined value. Anterior-posterior segments were normal.

Conclusions

Corneal sensitivity is an important corneal function whose normal data have been identified in adults and has even been suggested to be used as a diagnostic tool, especially for neuropathy in diabetes. Although there are studies in the literature on sensitivity to pathologies in the pediatric age group, no normative data for the pediatric age group has been published. With this study, we pioneered normative data in the pediatric age group.

Financial Disclosure of all authors

The authors have no relevant finacial or nonfinancial interests or disclose. Author Pelin Akçay declares, that she has no conflict of interest. Author Ozlem Barut Selver declares that she has no conflict of interest.

Abstract #172

Evaluation of the Effects of Patching Therapy on Dry Eye Tests and Tear Osmolarity in Children with Amblyopia

Z. Akgun*[a], M. Palamar[b], E. Demirkilinc Biler[b]

[a] *Van Research and Training Hospital, Van, TURKEY ;* [b] *Ege University, Faculty of Medicine, Department of Ophthalmology, Izmir, TURKEY*

** Presenting author (zeyakgunn93@gmail.com)*

Purpose

To compare the dry eye tests, meibography, and tear osmolarity results in both eyes of amblyopic children with and without patching therapy, and to determine the effect of patching duration on these parameters.

Setting

This study was conducted at Ege University Faculty of Medicine Department of Ophthalmology, and Van Research and Training Hospital Department of Ophthalmology, Turkey. In this prospective study, 98 eyes of 49 patients (22 female, 27 male) were included.

Methods

Cooperative children aged between 5-12, with no ocular surgical intervention or surface disease, and who were on patch therapy for at least 3 months were included. Following anterior-posterior segment and refraction examinations, Schirmer-1 test was performed to evaluate tear production, upper-lower eyelid meibography was performed to demonstrate gland morphology. Meibography results were graded as described by Arita et al. Tear osmolarity was measured with *Tearlab ® Osmolarity System* (TearLab Corporation, CA, USA). Patients were divided into two groups according to their patching durations (Group 1: patching 2-6 hours/day, n=21; Group 2: patching more than 6 hours/day, n=28).

Results

The mean age was 6.7±0.7 (4-12) years, the mean follow-up time was 19.1±13.8 (3-60) months. The most common indication for patching was strabismic amblyopia, followed by anisometropia (38.7%) and deprivation (6.1%). Although osmolarity, Schirmer-1, and meiboscores were higher in the eyes with patching, difference was not significant (p=0.179, 0.201, 0.802, 0.145, respectively). When the patients were compared according to patching duration, there was no difference in terms of age and gender (p=0.854, p=0.302, respectively). Although osmolarity, Schirmer-1, and meiboscores were higher in Group 2, difference was not significant (p= 0.153, 0.633, 0.982, 0.929, respectively).

Conclusions

Although some reports are referring the possible effect of patching treatment to increase inflammatory markers and impair tear quality, it has been determined that patching due to amblyopia does not affect osmolarity, tear production, and meibomian gland morphology

Financial Disclosure of all authors

The study was carried out with the financial support of the Ege University Office of Scientific Research Projects.

Abstract #173

Successful application of buccal mucosal graft transplantation in resistant suture exposure of transscleral-sutured posterior chamber intraocular lens

Z. Akgun*[a], N. Kocak[b], O. Barut Selver[c]

[a] *Van Research and Training Hospital, Van, TURKEY ;* [b] *Dokuz Eylul University Faculty of Medicine, Department of Ophthalmology,, Izmir, TURKEY ;* [c] *Ege University Faculty of Medicine, Department of Ophthalmology,, Izmir, TURKEY*

** Presenting author (zeyakgunn93@gmail.com)*

Purpose

To report the successful reconstruction of the suture exposure with the oral mucosal graft in a case with suture exposure after transscleral-sutured posterior chamber intraocular lens (TSIOL) implantation.

Setting

This study was conducted at Ege University Faculty of Medicine Department of Ophthalmology, Dokuz Eylul University Faculty of Medicine Department of Ophthalmology, and Van Research and Training Hospital Department of Ophthalmology, Turkey.

Report of case

The patient, who had a history of vitreoretinal surgery and subsequent TSIOL implantation after complicated cataract surgery in another center, was referred to our department because of TSIOL suture exposure. The main complaint of the 70-year-old patient was redness, watering, and stinging in the right eye. The best corrected visual acuity was 20/2000 OD and 20/50 OS. Bilateral pseudophakia was detected on slit lamp examination. Intraocular pressures were within normal limits and fundus examination revealed myopic fundus findings.

It was noticed that the PC9 sutures were exposed from both the nasal and temporal conjunctiva in the right eye of the patient, and there was a scleromalacia appearance in the same regions. Despite both tenoplasty and amnion membrane transplantation (AMT) procedures, exposure could not be controlled. Subsequently, oral mucosal grafts were transplanted from the buccal mucosa as an alternative to the resistant exposure areas. One layer of protective AMT was performed over each graft which was fixed to the episclera with a 6.0 vicryl suture. With this method, it was observed that the exposure was effectively controlled, and no recurrence was detected in approximately 3 months of follow-up.

Conclusion/Take home message

Oral mucosal graft can be used in many ocular pathologies that require conjunctival reconstruction due to the simplicity of tissue excision from the mucosa, allowing adequate tissue excision, durability of the obtained tissue, and ease of use. The present case report highlights

Abstract #174

Ulcerative colitis related intrastromal corneal opacification

M. Alexaki*[a], V. Liarakos[a]

[a] *AKTINA OPHTHALMOLOGY CENTER, Athens, GREECE*

** Presenting author (malexaki@hotmail.com)*

Purpose

To present a case of progressing corneal clouding in a patient with ulcerative colitis.

Setting

1AKTINA Center, Athens, Greece
2Naval and Veterans Hospital, Athens, Greece

Methods

A 23-year-old female patient was referred with asymptomatic multiple bilateral corneal opacifications. The patient had recently initiated systemic treatment with the monoclonal antibody Vedolizumab for ulcerative colitis that was diagnosed years ago. In the one eye, one of the opacifications progressed significantly, threatening the visual axis. High resolution Spectral Domain Anterior Segment OCT, Ray tracing Aberrometry, Corneal Topography and Slit Lamp imaging were used at follow up.

Results

Tomography scans revealed a morphology of extensive subepithelial infiltrates accompanied by keratocyte reaction in the anterior stromal. Opacifications could not be identified as deposits. On the contrary, the images indicated some immunological response of the underlying disease (ulcerative colitis) possibly exacerbated by the immunomodulation induced by the administration of the monoclonal antibody.
Therefore, topical Cyclosporine-A 0.1% was administered three times daily for 2 months. Initially, progression was halted and later opacification was reduced in size and faded.

Conclusions

In case of systemic immunomodulating treatment, ulcerative colitis may cause significant and potentially vision-threatening subepithelial corneal infiltrates and stromal opacification that responds successfully to topical Cyclosporine-A.

Financial Disclosure of all authors

No financial disclosure of all authors.

Abstract #175

Exploring the human experience of congenital aniridia: a narrative medicine approach

C. Ancona*[a], MG. Marini[b], I. Kildsgaard[c], D. Bremond-Gignac[d], N. Szentmary[e], N. Lagali[f], V. Romano[a]

[a] UNIVERSITY OF BRESCIA, Brescia, ITALY ; [b] ISTUD, Milano, ITALY ; [c] Aniridia sweden, Stockholm, SWEDEN ; [d] Head of Ophthalmology Department, University Hospital Necker Enfants Malades, APHP, and INSERM UMRS 1138, T17, Paris, FRANCE ; [e] Dr. Rolf M. Schwiete Center for Congenital Aniridia and Limbal Stem Cell Research, Saarland University, Homburg/saar, GERMANY ; [f] Linköping University, Linköping, SWEDEN

** Presenting author (chia.ancona@gmail.com)*

Purpose

To use narrative medicine to explore the illness burden from an emotional and social perspective as experienced by congenital aniridia patients and their caregivers.

Setting

Multicentric observational study

Methods

Patients affected by congenital aniridia and their caregivers were included. Sociodemographic data were collected together with completion of plots of illness with narrative prompts chosen according to the age of the patients and the role of caregiver or patient, that help the person to express themselves. Respondents could finalize their narratives in writing or in an interview. Then, a qualitative analysis was conducted on the narratives.

Results

A total of 58 narratives were collected: 31 narratives of patients and 27 of caregivers. The mean age of patients and caregivers were 32.5 ± 16.7 and 43.6 ± 7.5 years, respectively. 28% of respondents had the centre for aniridia in the same town where they lived. They visited an average of 5.1 ± 5.9 healthcare facilities during their lifetime. Each year an average of 560 ± 932 euros was spent on healthcare visits. For 39% of patients and 56% of caregivers aniridia had an impact on their work situation or they lost days of work/school because of aniridia.

Conclusions

Congenital aniridia has a significant impact on vision with progressive visual impairment. Narrative medicine facilitates research into the emotional and social effects of the condition on patients and their caregivers, providing valuable information for clinical practice. This includes identifying their significant concerns and limitations, as well as their needs.

Financial Disclosure of all authors

None.

Abstract #176

Pseudo-Ocular Cicatricial Pemphigoid in a Bilateral Cicatrizing Conjunctivitis : The application of human amniotic membrane with Limbal stem cell transplantation: surgical management of limbal stem cell deficiency - A Case Report

B. Azarkan*[a], R. Elhachimi[b], T. Baiz[b], H. Lazaar[b], A. Amazouzi[b], N. Boutimzine[b], LO. Cherkaoui[b]

[a] *HOSPITAL OF SPECIALTIES, Rabat Harhoura, MOROCCO ;* [b] *Hsr, Rabat, MOROCCO*

** Presenting author (boutayna.azarkan@gmail.com)*

Purpose

Cicatricial conjunctivitis is chronic disease with conjunctival fibrosis that may lead to alterations of conjunctival
architecture, potentially sight-threatening. Causes of conjunctival cicatrization are not limited to autoimmune diseases, such as ocular cicatricial
pemphigoid. Other well-known causes include thermal and chemical burns, Stevens-Johnson , Ocular rosacea,
eye drops in the treatment of glaucoma, often underdiagnosed.
This case study aims to describe a similar process, an atypical case about a Pseudo-ocular pemphigoid cicatricial after chemical ocular burns, limited only to the conjunctiva, amniotic membrane is an ideal biological substrate that can help maintain and support the expansion of limbal epithelial stem cells.

Setting

We received a 35yo man in the ophthalmological department. The medical history was relevant for chronic exposure to lime due to his mason profesion, the patient had no associated ophtalmological or systemic disease. He consults for a progressive visual acuity decline since 6months. He presented with chronic bilateral cicatrizing conjunctivitis

Report of case

On clinical examination, we had found in the left eye reduced vision : 20/400,with meibomian gland dysfunction, severe inflammation and eye dryness, upper tarsal scarring with lateral canthal fibrosis, limbal stem-cell deficiency characterized by extents of conjunctival ingrowth, symblepharon formation and severe fornix shortening was also noted, with total ocular surface dermalization, in addition to deep corneal neovascularization.
In the right eye, visual acuity was 20/40, we found ocular surface dermalization with neovascularization only on the inferior half of the cornea.
No characteristic extraocular findings like peri-ocular vitiligo, alopecia, and lack of sweating were found. Nasofibroscopy wasnormal.
Conjunctival biopsy with immunostaining was performed, taken from the inferior nasal fornix, to distinguish for suspected mucus membrane pemphigoid : no vesiculobullous formation found.
The patient underwent ocular surface reconstruction with the aid of amniotic membrane.
To restore a healthy surface: we realised a conjunctival epitheliectomy after scar tissue was removed, the first layer of the amniotic membrane was attached with tissue adhesive and fibrin glue while the second layer amniotic membrane, was placed over the cornea, the bulbar, and tarsal conjunctiva, and was secured with 8-0 Vicryl sutures to the conjunctival edges. to transplant a bio-engineered graft by expanding limbal epithelial stem cells ex vivo on amniotic membrane. stem cells could not be obtained from the contralateral eye, we choose to expand cells in vivo in order to decrease the need for large limbal resection.
To perform a limbal stem cell transplantation procedure, the ocular surface was optimized by controlling comorbid conditions. These factors include adequate control of the ocular surface inflammatory status, and a well-lubricated ocular surface.
Postoperative care : topical medications for inflammation alleviation. Systemic immunosuppressive agents were discussed, we indicated oral prednisolone.
No recurrence of symblepharon was noted during the 6months follow-up.

Conclusion/Take home message

We aim at highlighting the important role of Amniotic membrane in the treatment of pseudoocular pemphigoid, or the benefit of cornea and ocular surface specialists, general ophthalmologists, and ophthalmology residents.

A systematic approach is required for the clinical history, examination, and laboratory investigations of patients to arrive at the correct diagnosis of the underlying cause.Effective management of patients requires knowledge of multiple modalities such as systemic immunosuppressive therapy, use of scleral contact lenses, and surgery for ocular surface and vision improvement

Abstract #177

RESULTS OF 250 CASES OF COSMETIC KERATOPIGMEBNTATIONS

G. Baikoff*[a], O. Chauveau[b]

[a] *CENTRE VISION FUTURE, Theoule Sur Mer, FRANCE ;* [b] *CENTRE VISION FUTURE, Nice, FRANCE*

** Presenting author (georges.baikoff@wanadoo.fr)*

Purpose

THE AUTHORS REPORT 250 CONSECUTIVE CASES OF COSMETIC KERATOPIGMENTATIONS;
COSMETICAL, ANATOMICAL, PSYCHOLOGICAL RESULTS ARE ANALYSED AN DISCUSSED.

Setting

THESE CASES WERE PERFORMED IN 2 DIFFERENT CENTRES IN NICE- FRANCE SINCE 2021

Methods

AFTER EXCLUDING CORNEAL PATHOLOGIES OR SUBCLINICAL KERATOCONUS. PIGMENTS ARE INTRODUCED IN A CORNEAL TUNNEL CREATED USING FEMTOLASER AND THE CORNEAL RING SOFTWARE UNDER TOPICAL ANAESTHESIA TOPICAL ANTIBIOTIC AND STEROIDS ARE PRESCRIBED FOR 4 WEEKS POSTOP AND ARTIFICIAL TEARS FOR 3 MONTHS

Results

no severe complications were observed . No infections, some dryness, less than 5% fading needing a touch up.
The main concern was the acceptance of the family circle and in some cases the acceptance by the patient himself of his new physinomy.
2 patients were asking for going back to their previous status.

Conclusions

After 4 years experience we can tell that this technique initially indicated for therapeutic cases can be used in cosmetic cases following the same history as Botox and Hyalonic acid in the past.

Financial Disclosure of all authors

no financial interest

Abstract #178

A Case Report: Management of refractory corneal melting due to IgG4-related disease with buccal mucosal graft transplantation

O. Barut Selver*[a], Z. Akgun[b], T. Akalin[c]

[a] Ege University Faculty of Medicine, Izmir, TURKEY ; [b] Van Research and Training Hospital, Van, TURKEY ; [c] Ege University Department of Pathology, Izmir, TURKEY

** Presenting author (ozlembarutselver@gmail.com)*

Purpose

To present the successful management of a case with refractory corneal melting due to IgG4-related disease with oral mucosa graft.

Setting

This case report was conducted at Ege University Faculty of Medicine Department of Ophthalmology, Ege University Faculty of Medicine Department of Pathology, and Van Research and Training Hospital Department of Ophthalmology, Turkey.

Report of case

A 56-year-old female patient was referred to our clinic due to infectious corneal melting that was not responsive to treatment. On examination, the right eye was phthisic, the visual acuity in the left eye was light perception, and it was observed that there was intense conjunctival inflammation and a large, infected area extending from the center of the cornea to its upper part, accompanied by melting. From her medical history, it was learned that she has had dryness in both eyes for more than 10 years, and for her right eye, she underwent multiple corneal transplantation surgeries with similar complaints and subsequently underwent evisceration surgery. It was learned that her complaints in her left eye have increased for the last 6 months and amniotic membrane transplantation (AMT) was performed 8 times in an external center. The patient was hospitalized and treated with empirical antibiotics, preservative-free tears, and systemic doxycycline after corneal scraping, conjunctival and corneal biopsy. Due to the IgG4/IgG ratio >40% and lymphoplasmacytic infiltration found in the corneal pathology specimen, the patient whose corneal biopsy result was reported as compatible with IgG4-related disease, was also consulted to rheumatology. Despite the whole treatment and two more AMT applications, clinical findings were not regressed so, it was decided to perform oral mucosal grafting and systemic immunosuppression. After surgery, the patient was treated with a steroid-antibiotic combination and cyclosporine topically besides systemic immunosuppression. During the follow up corneal melting regressed, and the surface was epithelialized in the 1st month. In the 2nd month, due to limbal stem cell deficiency, the oral mucosa epithelium resembled the conjunctival epithelium phenotypically and the cornea became entirely opaque and intact, the ocular surface inflammation almost completely regressed. The patient's follow-up and systematic investigations continue in the rheumatology department, moreover.

Conclusion/Take home message

IgG4-related disease rarely involves conjunctival inflammation. The main pathology in the present patient was evaluated as chronic conjunctival inflammation and secondary limbal stem cell failure and recurrent resistant corneal ulcer. Resistant corneal ulcers cause both infection and corneal melt. With the suppression of inflammation, oral mucosa graft seems to be effective as an alternative option in resistant corneal melting.

Abstract #179

Tuck in amniotic membrane assisted with femtosecond-laser for the management of chronic painful bullous keratopathy in an eye with poor visual potential: case report

M. Bautista Cortiella*[a], E. Fernández López[a], MJ. Roig Revert[a], G. Roig Ferreruela[a], C. Peris Martínez[a]

[a] *FUNDACIÓN DE OFTALMOLOGÍA MÉDICA DE LA COMUNIDAD VALENCIANA, Valencia, SPAIN*

** Presenting author (marc.bautista@fom.es)*

Purpose

The purpose of this case is to exhibit a new approach in the surgical management of painful bullous keratopathy in eyes with low visual potential. Treatments range from topical hypertonic eyedrops and soft contact lenses to surgical procedures including therapeutic photokeratectomy (PTK), amniotic membrane, Gundersen flap and keratoplasty. Amniotic membrane represents an effective treatment for painful bullous keratopathy. The classical procedure is well widespread and established among corneal surgeons. Nevertheless, the surgical technique undertaken hardly ever includes the use of femtosecond-laser (FS-laser).

Setting

Fundación de Oftalmología Médica de la Comunidad Valenciana (FOM), Valencia (Spain)

Report of case

A 56-year-old man was referred to treat a chronic painful bullous keratopathy in his left eye (LE). He had had a penetrating trauma 20 years ago and had his traumatic cataract removed without intraocular lens replacement and history of a chronic retinal detachment. At first consultation, he presented a painful blind eye, and bullous keratopathy. He wore a soft contact lens to soothe the pain. The fellow eye was normal and had 20/20 vision. We decided to perform a phototherapeutic keratectomy (PTK), which had to be performed twice because of a relapse. Even he was initially less symptomatic, pain reappeared after two months. We decided to try an amniotic membrane (AM) patch with tuck in technique assisted with FS-laser 9 months after the last PTK. We programmed a 7,5mm diameter horizontal incision 190µm deep and a vertical cut 6,8mm in diameter and 210µm deep with the FS-laser to create a superficial lenticule and peripheral pocket. We removed the lenticule, opened the pocket and tucked in the AM without sutures. A bandage contact lens was kept for one month. After the surgery, his symptomatology improved, bullae gradually resolved, and he remains stable after one year follow-up.

Conclusion/Take home message

The tuck in amniotic membrane assisted with FS-laser represents an alternative surgical approach when performing AM patchs. Although this surgery can be performed manually by means of a superficial keratectomy and manual peripheral pocket, FS-laser makes the technique much easier in these complicated eyes. This is a promising technique to treat chronic painful bullous keratopathy in eyes with poor visual potential when other techniques fail. Long-term outcomes and results in a larger sample size need to be confirmed. Parameters of the depth of the lenticule and peripheral pocket could be further refined.

Abstract #180

Clinical and treatment outcomes of ocular rhinosporidiosis

N. Bejan Singh*[a], SM. Bejan Singh[a]

[a] *BEJAN SINGH EYE HOSPITAL, Nagercoil, INDIA*

** Presenting author (niranjanabsingh@yahoo.co.in)*

Purpose

to study the various presentation of ocular rhinosporidiosis and effectiveness of wide margin excision without basal cautery on the recurrence rate of ocular rhinosporidiosis

Setting

Bejan Singh Eye hospital, Nagercoil, India

Methods

study design: retrospective study
inclusion criteria: HPE proven ocular rhinospordiosis
exclusion criteria : adnexal rhinosporidiosis, rhinosporidium elsewhere
method:
35 patients with HPE proven rhinosporidiosis were taken for our study.
All patients had undergone wide margin no touch excision of the vascular lesion without basal cautery. Patching was done to achieve homeostasis.
The mean duration of presentation , location (bulbar/papebral/caruncular) and recurrence rate were noted.

Results

All age groups were equally affected.The mean age of presenation was 36.13 SD 21.1 years
It was more common (66%) in males than females (34%).
Right eye (54%)had a slightly more predilection than left eye (46%).
Lower palpebral conjunctiva (40%) was the most common site followed by upper palpebral conjunctiva (34%) and then bulbar conjunctiva (20%) . 2 patients (6%) patient had caruncular lesion.
The recurrence rate of ocular rhinosporidiosis was 6 % (2 eye). Of the two patients one had recurrence after 3 years and another after 7 years at different, so chances of new infection cannot be ruled out.

Conclusions

Lower palebral conjunctiva is the most common site of ocular rhinosporidiosis.
Wide margin excision is an effective treatment option for ocular rhinosporidiosis even without basal cautery

Financial Disclosure of all authors

none

Abstract #181

Advanced use of layered amniotic membrane dressing in corneal perforations - cooling off the "hot transplant" of the cornea

J. Bogusławska*[a], K. Chryplewicz[a], A. Kowal - Lange[a], D. Dobrowolski[b]

[a] PROVINCIAL SPECIALIST HOSPITAL - RESEARCH AND DEVELOPMENT CENTER, Wrocław, POLAND ; [b] PROVINCIAL SPECIALIST HOSPITAL - TRAUMA CENTER, Sosnowiec, POLAND

** Presenting author (joanna.agnieszka.boguslawska@gmail.com)*

Purpose

Treatment of corneal perforation with a layered amniotic membrane dressing with temporary tarsorrhaphy is not a final solution, but is a transitional stage before a penetrating corneal transplant. Once the inflammation is under control, a corneal transplant is performed from optical indications. The risk of corneal rejection is minimized, which is particularly important considering the significant number of people awaiting a corneal transplant. In Poland, according to Poltransplant data as of December 2020, the total number of patients waiting for corneal transplantation is 2,955. The second important issue is the increased risk of rejection of the next transplant.

Setting

The study presents 4 cases of the use of layered amniotic membrane dressing in corneal perforations of various sizes, etiologies. In three cases temporary eyelid tarsorrhaphy was performed. The cases described were examples of perforations in which "hot" penetrating keratoplasty would be associated with a high risk of graft rejection.

Methods

In our center, we fix the inner layers of the amniotic membrane dressing to the cornea with a 10.0 non-absorbable suture. Sewing is performed bypassing the optical center. The remaining part of the dressing is sewn to the limbus with single sutures and to the conjunctiva with a circular suture. We try to obtain the largest possible number of layers of the amniotic membrane dressing from the dressing provided by the Tissue Bank. Use of a contact lens and partial tarsorrhaphy provides the necessary external pressure and stabilization, enabling compression and incorporation of the amniotic membrane into the corneal defect.

Results

Patients undergoing treatment presented the following eye conditions: neurotrophic keratopathy; acute necrosis of the corneal stroma; fulminant keratitis and a condition after mechanical trauma to the cornea. Primary repair of the corneal perforation was successfully performed in two patients, second repair in 1 patient, third in 1 patient. In all treated patients, the amniotic membrane incorporated into the corneal defect and was covered with epithelium. The longest observation period is 4.5 years. Patients with the shortest follow-up period - 4 months - died as a result of the underlying disease, while maintaining the integrity of the eye.

Conclusions

So far, layered amniotic membrane dressing with partial tarsorrhaphy of the eyelids has led to a successful outcome of all corneal perforations in our patients, even those with poor prognosis. We highly recommend this method of treating perforation as the initial stage of treatment.

Financial Disclosure of all authors

All authors have no finances to disclose

Abstract #182

Outcomes of low-level light therapy before and after cataract surgery for the prophylaxis of postoperative dry eye: A prospective randomized double-masked controlled clinical trial

M. Borselli*[a], C. Rossi[a], G. Carnovale Scalzo[a], G. Scalia[a], R. Pietropaolo[a], V. Scorcia[a], G. Giuseppe[b]

[a] *UNIVERSITY MAGNA GRAECIA OF CATANZARO, Catanzaro, ITALY ;* [b] *UNIVERSITY of Cagliari, Cagliari, ITALY*

** Presenting author (borsellim93@gmail.com)*

Purpose

The primary endpoint with respect for the effect of low-level light therapy (LLLT) performed before and after cataract surgery was the change in non-invasive break-up time (NIBUT) from T0 to T2. The secondary endpoints were the changes in ocular discomfort symptoms, tear meniscus height (TMH), meibomian gland loss (MGL) and redness from T0 to T2.

Setting

The study was conducted at the Department of Ophthalmology of the University Magna Graecia of Catanzaro in Italy.

Methods

This was a prospective, interventional, randomized, controlled, double-masked clinical trial. Patients were randomly assigned 1:1 to receive either LLLT or sham treatment (LLLT with a power output <30%). Patients underwent two treatment sessions: 7±2 days before cataract surgery (T0) and 7±2 days after (T1). Outcome measures evaluated 30±4 days after surgery (T2) included Ocular Surface Disease Index (OSDI) questionnaire, NIBUT, TMH, MGL and redness score.

Results

Out of 153 patients randomized to receive LLLT (n=73) or sham treatment (n=80), 131 (70 men, 61 women, mean age 73.53±7.29 years) were enrolled. Patients treated with LLLT had significantly lower OSDI scores compared with controls at T1 and T2 (respectively, 7.2±8.8 vs 14.8±13.0 and 9.0±9.0 vs 18.2±17.9; both $p<0.001$), higher NIBUT values at T2 (12.5±6.6 vs 9.0±7.8; $p=0.007$) and lower MGL Meiboscore values at T1 (1.59±0.70 vs 1.26±0.69; $p=0.008$). Unlike controls, patients treated with LLLT had significantly lower OSDI scores and higher NIBUT values at T2 compared with T0 (respectively, 9.0±9.0 vs 21.2±16.1; $p<0.001$ and 12.5±6.6 vs 9.7±7.2; $p=0.007$).

Conclusions

Two sessions of LLLT performed before and after cataract surgery were effective in ameliorating tear film stability and ocular discomfort symptoms.

Financial Disclosure of all authors

All authors declare that they have no financial disclosures, funding, or grant support to report.

Abstract #183

Individualized Dry Keratitis Lesion Area Assessment using Deep Learning

I. Brahim[a], AA. Benyoussef[b], FZ. El Barche[c], A. Lamard[d], M. Lamard[c], B. Cochener-Lamard[b]

[a] INSERM, UMR 1101, UMR 1227, Brest, F-29200, France, Brest, FRANCE ; [b] Service d'Ophtalmologie, CHRU Brest, Université de Bretagne Occidentale, INSERM, UMR 1101, Brest, F-29200, France, Brest, FRANCE ; [c] Université de Bretagne Occidentale, INSERM, UMR 1101, Brest, F-29200, France, Brest, FRANCE ; [d] INSERM, UMR 1101, Brest, F-29200, France, Brest, FRANCE

Purpose

In our previous study, we developed a deep learning algorithm to detect cornea keratitis. We demonstrated that there was a better correlation when using the detected keratitis area rather than counting the keratitis with the specialist assigned oxford score. In this study we improved our algorithm by considering the full cornea area of the patient to obtain a more accurate measurement. By adapting the algorithm to factor in the unique full cornea area of each patient we can obtain a more precise evaluation.

Setting

Our dataset comprised 86 fluorescein-stained eye examination videos from 43 patients, captured with a slit lamp and camera (ION, Quantel). A specialist selected two keratitis frames per eye and a sequence of images that best represents the cornea.

Methods

Our method is composed of two parts, first to obtain the keratitis area and second the full area of the cornea. For the first part; the keratitis were manually annotated by a specialist on the full dataset using the open source "PixelAnnotationTool". To train a segmentation model, we incorporated the python library "Segmentation Models" into our algorithm. For the second part; we implemented an automated full cornea surface measurement. By finding the best fit circle at the cornea-sclera limbus on a sequence of images. We then apply an average to obtain the cornea area avoiding the eyelid position.

Results

Our algorithm was evaluated on a test set of 2 eyes. For the first part of our method, our keratitis area prediction segmentation model obtained a dice score = 0.86. We determine the affected percentage of the cornea by dividing keratitis' predicted area and the full area of the cornea (in pixels). The Oxford score assigned by specialists and the percentage of the affected area showed a strong correlation (Pearson's $r = 0.84$, $p < 0.001$) in our study.

Conclusions

Our previous study showed a Pearson's correlation of $r = 0.78$ when using the keratitis area, and $r = 0.82$ counting the number of keratitis compared to the specialist assigned oxford score. Using the affected area has a slightly improved correlation to $r = 0.84$ ($p < 0.001$).This highlights the importance of considering the personalized patient's corneal area compared to the traditional oxford score counting method.

Financial Disclosure of all authors

Abstract #184

Evaluation of Demographic,Clinical Characteristics and Management of Pediatric Ocular Rosacea Cases

O. Bulut Tarlabolen*[a], M. Palamar Onay[a], O. Barut Selver[a]

[a] *EGE UNIVERSITY FACULTY OF MEDICINE, Izmir, TURKEY*

** Presenting author (okynsbulut@gmail.com)*

Purpose

The aim of the study is to detect the demographic and clinical characteristics and to evaluate treatment responses of pediatric ocular rosacea cases.

Setting

Medical records of patients aged ≤18 who were diagnosed with ocular rosacea between 2020 and 2023 at Ege University Ophthalmology Cornea unit were retrospectively examined.

Methods

Medical records of patients aged ≤18 who were diagnosed with ocular rosacea between 2020 and 2023 at Ege University Ophthalmology Cornea unit were retrospectively examined. Diagnostic criteria were determined as meibomian gland dysfunction, blepharitis, lid margin telangiectasia, punctate epitheliopathy and inferior corneal vascularization, and conjunctival hyperemia. Disease severity was classified as 0-4 according to the composite clinical severity score defined by Audelan et al. in 2021 (Audelan, Tiphanie et al. Clinical, Meibographic, and Interferometric Evaluation in Children With Ocular Rosacea AJO 2021:237;13-21).

Results

A total of 31 patients (62 eyes) were included the study. The most common complaints were burning-stinging (58%) and visual impairment (29%). The most common findings were bilateral blepharitis-lid margin telangiectasia (100%), while recurrent chalazion/hordeolum (51.6%) was in the second. Corneal vascularization were observed in 24 eyes (38.7%), punctate epitheliopathy in 23 eyes (37%), marginal keratitis in 6 eyes (9.6%), skin findings in 10 patients (32.2%). The disease severity score was calculated as 2.4±1.1 before treatment. Post-treatment it was 1.3±1.4. Regression was observed in all patients. ($t= -9.25, p<0.001$).

Conclusions

Pediatric ocular rosacea is an important ophthalmological pathology that can cause serious morbidity with corneal involvement and is often overlooked due to the difficulties in diagnosis and examination in children, although its prevalence is low. In addition to careful examination and anamnesis, correct classification and process management are important for appropriate and morbidity-preventive treatment.

Financial Disclosure of all authors

The authors have no relevant financial or nonfinancial interests to disclose.

Abstract #185

When the ocular surface compromises surgery

C. Cauto Picazo*[a], L. Azorín Pérez[a], M. Solaz Ruiz[a], A. Hervás Ontiveros[a]

[a] *Hospital Universitario y Politécnico La Fe, Valencia, SPAIN*

** Presenting author (carloscauto96@gmail.com)*

Purpose

The primary objective of this article is to underscore the imperative need for proper control of any condition affecting the ocular surface, such as ocular cicatricial pemphigoid, prior to considering any other actions on the eye. We also aim to emphasize effective collaboration among different ophthalmologic subspecialties and other medical personnel, focusing on optimizing patient care to achieve optimal clinical outcomes and enhance quality of life.

Setting

Hospital Universitario y Politécnico La Fe, Valencia, España.

Report of case

This is the case of an 86 years-old Caucasian man, with past ocular history of trichiasis, referred to our hospital with a conjunctival biopsy for suspicion of ocular pemphigoid. However, before being evaluated in our centre, he worsened clinically and underwent a penetrating keratoplasty for tectonic purposes due to ocular perforation.

Two months later, Oculoplasty evaluation revealed forniceal shortening in right eye (OD) and lower eyelid marginal entropion with symblepharon area on tectonic penetrating keratoplasty of left eye (OS).

The results of the biopsy were not yet available but the patient was referred to Rheumatology to start immunosuppression due to high suspicion of ocular cicatricial pemphigoid.

In the Cornea Section consultation, keratoplasty presented significant inferior thinning with conjunctivalization and large neovasus. He was listed for another penetrating keratoplasty OS + intrastromal bevacizumab, with the purpose of performing in the same act a tarsal fracture + buccal mucosa graft.

In the next revision, in addition to the inferior thinning there was a central erosion with slight thinning, which persisted for the next 3 months until he underwent another penetrating keratoplasty OS, without acting on the palpebral defects.

Two weeks after the second keratoplasty, an epithelial defect affecting the entire corneal button with central thinning emerged. During the following days, the epithelial defect was reduced but the thinning did not improve, so it was decided to operate jointly Oculoplasty and Cornea. Symblepharon debridement (with jugal mucosa graft) and amniotic membrane covering of persistent corneal erosion in the OS was performed.The eye was left occluded for one week with a Frost suture.

At the 7-day check-up, the epithelial defect improved despite having completely digested the amniotic membrane. Frost suture was removed and a good fornice was found with oral mucosal graft well-positioned. During subsequent follow-up, the patient has remained stable to date.

Conclusion/Take home message

When it refers to a pathology such as OCP, it is essential to carry out the treatment in a stepwise manner. A high suspicion diagnosis will allow us to start treatment early and obtain better results. A systemic therapy is always recommended, and it may be useful to associate topical treatment. When the disease is advanced, it is usually necessary to perform reparative surgery. Surgical intervention may incite further scarring, but may be essential to control entropion and trichiasis. To ensure the success of this procedure it is mandatory to first control the inflammation and solve any pathology of the eyelid before acting on the cornea, otherwise the probability of failure is considerable

Abstract #186

Outcomes of using the Biovance® 3L Ocular Human Amniotic Membrane Allograft for corneal epithelial defects

E. Chang*[a], N. Venkateswaran[a]

[a] *Massachusetts Eye and Ear, Boston, UNITED STATES*

** Presenting author (enchi_chang@meei.harvard.edu)*

Purpose

A novel three-layer acellular amniotic membrane, the Biovance® 3L Ocular Human Amniotic Membrane Allograft by Verséa Therapeutics, has become recently available and has not been widely studied in clinical practice. As such, we aim to evaluate the use of this new amniotic membrane allograft in patients with various corneal pathologies or undergoing corneal procedures.

Setting

This study was conducted at Massachusetts Eye and Ear in Boston, Massachusetts, USA.

Methods

This was a retrospective chart review of patients who underwent amniotic membrane transplantation (AMT) with the new Biovance® 3L Ocular Human Amniotic Membrane Allograft between January and October 2023. Outcome measures included best-corrected visual acuity, resolution of the epithelial defect, and any complications from the amniotic membrane transplantation.

Results

This study included 8 eyes from 7 patients, ages 31 - 80, with follow-up ranging from 5-41 weeks. Corneal diagnoses treated were recurrent corneal erosions, Salzmann's nodular degeneration and persistent epithelial defects in prior corneal grafts. The visual acuities for 6 eyes at their last visits were improved or stable compared to their pre-AMT placement visit and ranged from 20/25 to hand motion. The AMT dissolved within 1 week with resolution of the epithelial defect for most eyes. Complications included AMT incorporating into the epithelium, a late recurrent epithelial defect with elevated intraocular pressure, and progressive corneal graft thinning.

Conclusions

The Biovance® 3L amniotic membrane is a safe, well-tolerated and effective for the treatment of corneal epithelial defects due to various corneal pathologies or corneal procedures. Complications were related to the graft incorporating into the epithelium, recurrent epithelial defect, and corneal graft thinning.

Financial Disclosure of all authors

None

Abstract #187

A Seven Year Review of Blood Derived Allogenic Serum Eye Drops (alloSED) in National Health Service (NHS) Lanarkshire, Scotland

J. Cuthbertson*[a], F. Simspon[a], E. Muller[b], A. Arora[b], D. Lyall[a]

[a] *NHS LANARKSHIRE, East Kilbride, UNITED KINGDOM ;* [b] *University of Glasgow, Glasgow, UNITED KINGDOM*

** Presenting author (cuthbertsonjosh@gmail.com)*

Purpose

To report on the real-world clinical experience of the use of alloSEDs in the context of ocular surface disease in NHS Lanarkshire, Scotland, over a 7-year period.

Setting

NHS Lanarkshire, Department of Ophthalmology, provides services to a population of just under 700,000 adults and children. The population is diverse and serves urban and rural areas stretching over 2,000 square kilometres. alloSEDs have been reported as a useful adjunct in severe ocular surface disease across a spectrum of diagnoses.

Methods

Retrospective case note review and service evaluation of patients treated over a 7-year period: March 2016 - November 2023. Demographic data was collected, as well as; treatment received to date by each individual patient (including topical, systemic and surgical) both before and after the introduction alloSEDs; length of time on alloSEDs; indications for alloSEDs (based on United Kingdom National Health Service Blood & Transplant (NHSBT) data); assessment of stability of ocular surface whilst on alloSEDs.

Results

45 patients were prescribed alloSEDs. Average age 54.5 years old (6-91). Average time on treatment 728 days (32-2650). alloSEDs were prescribed for 12 indications. 61% were stable. Of those, 56% were steroid/immunosuppression free. Those requiring steroids/immunosuppression: 36% topical, 8% oral, 8% other immunomodulatory. Of those assessed unstable, 93% required steroids/immunosuppression: 85% topical, 21% oral, 28% other immunomodulatory. Prior to alloSEDs, 22 procedures were required in 17 eyes. After alloSEDs, 5 procedures in 5 eyes were required. Only 1 of these procedures was required in a stable patient. There were no adverse events or significant side effects reported.

Conclusions

In this 7-year real world review and service evaluation within NHS Lanarkshire, we have shown alloSEDs are a safe, well-tolerated adjunct in the management of severe ocular surface disease of numerous aetiologies. The majority of patients do not require additional steroids or other immunomodulatory agents or further surgical procedures for ocular surface indications, helping to reduce the local and systemic effects of these treatments.

Financial Disclosure of all authors

There are no financial disclosures to make for any author.

Abstract #188

How to relieve corneal from cicatricial conjunctivitis?

M. El Barkani*[a], C. Khodriss[a], H. Benmoussa[a], M. El Bahloul[a]

[a] *MOHAMMED VI HOSPITAL UNIVERSITY, Tanger, MOROCCO*

** Presenting author (einstein-med@hotmail.fr)*

Purpose

To demonstrate the beneficial effect of platelet-rich plasma, corticosteroid therapy and cyclosporine in the management of complications of Lyell syndrome on the ocular surface, particularly the cornea.

Setting

we report the case of a young patient with healing conjunctivitis following lyell's syndrome, treated by therapeutic escalation with platelet-rich plasma.

Report of case

A female patient, 37 years old, with the following history :
Lyell's syndrome in 2022, following a course of antibiotics of the "Penicillin" family with several cross-allergies
Stayed in intensive care unit for 15 days
She presented with acute bilateral conjunctivitis, more severe on the right side.
Currently presents chronic conjunctivo-corneal sequelae
Ophthalmological examination shows:
Visual acuity: 03/10 right eye and 09/10 left eye
In the adnexa, mixed blepharitis with mucous secretions
The right eye shows at corneal level: Presence of paracentral corneal clefts with TBUT= 1 Second and a Shirmer test at 5 minutes < 1 mm, the rest of the examination of the right eye was normal
Left eye: Grossly normal cornea with TBUT < 10 S and 5 min Shirmer test < 7 mm, rest of examination was unremarkable
Our management was based on a therapeutic escalation with, at the start, artificial tears without preservatives and treatment with topical corticotherapy followed by ciclosporin 2%. Given the lack of improvement, we opted for platelet-rich plasma with a clear clinical improvement, notably in TBUT, Shirmer test, and functional improvement with visual acuity arriving at 09/10 with scleral lenses fitting in the right eye and an OSDI score of 15.

Conclusion/Take home message

Platelet-rich plasma contains a high concentration of growth factors and cell adhesion molecules.
These elements play a major role in enhancing the physiological healing process
Can be an adjuvant therapeutic option to other medical and surgical therapies
Its fields of application remain broad
However, studies with a larger cohort of patients are needed, to compare their efficacy versus autologous serum and PRP

Abstract #189

The quality of life in patients with corneal dystrophy compared to visual acuity, higher order aberrations and corneal densitometry in Pentacam

C. Elhardt*[a], A. Aamoon[a], A. Wolf[a], CM. Wertheimer[a]

[a] *University Hospital Ulm, Ulm, GERMANY*

** Presenting author (c.elhardt@outlook.com)*

Purpose

Corneal dystrophies are a group of rare inherited diseases that cause visual impairment, which can affect social well-being, independence, and active participation in society. This study presents prospective data showing their impact on quality of life compared to a healthy control group. Quality of life scores were correlated with measurable anatomical and clinical findings such as visual acuity, higher order aberrations and corneal densitometry.

Setting

The prospective controlled study was conducted at the outpatient clinic of a tertiary university-based ophthalmology center.

Methods

40 patients presenting with corneal dystrophy between 2021 and 2024 were included. Fuchs endothelial dystrophy was excluded. All patients underwent an ophthalmic examination including Pentacam Scheimpflug imaging of the cornea. They completed two questionnaires, the National Eye Institute Visual Function Questionnaire (NEI-VFQ) and the Visual Function Questionnaire (VF-14) to assess the quality of life in terms of the impact of vision on various aspects of life. After consent, patients underwent genetic testing for corneal dystrophy. Additionally, a healthy group of 40 patients, matched for age and biological gender and without any eye disease, was used as a control group.

Results

9 different dystrophies were included, and genetic testing confirmed the dystrophies in 8 patients. The mean age of the patients was 57±17 years, and 60% of them were female. Compared to the control group, patients with corneal dystrophies reported a significantly worse overall quality of life in the VF-14 ($p<0.001$) and in all categories of the NEI-VFQ ($p<0.02$). The quality of life in corneal dystrophy showed a high correlation with both the visual acuity ($r=0.58-0.79$) and the higher order aberrations in the Pentacam imaging ($r=0.49-0.73$) and moderate correlations with the optical densitometry ($r=0.26-0.47$).

Conclusions

Corneal dystrophies can affect the quality of life in many ways. The findings of this study highlight the importance of identifying and, where possible, treating these rare diseases in order to improve general well-being and active participation in life.

Financial Disclosure of all authors

Carolin Elhardt: None
Ahmad Aamoon: None
Christian M. Wertheimer: None
Armin Wolf: Research grants and study fees (Allergan, Boehringer Ingelheim, Bayer, Alimera, Novartis, Oertli, Roche), Consulting honoraria and travel fees (Alimera, Allergan, Bayer, Boehringer Ingelheim Novartis, Oertli, Roche, Zeiss). All of these are not connected to this study.

Abstract #190

Alterations in corneal sensitivity according to age and gender in the healthy population

N. Eratilgan*[a], Z. Akgun[b], O. Barut Selver[a]

[a] *Ege University Faculty of Medicine, Department of Ophthalmology, Izmir, TURKEY ;* [b] *Van Research and Training Hospital, Department of Ophthalmology, Van, TURKEY*

** Presenting author (nihatfurkaneratilgan@gmail.com)*

Purpose

To analyze the variability of corneal sensitivity according to age and gender in the healthy population in Turkey.

Setting

This study was conducted at Ege University Faculty of Medicine Department of Ophthalmology, and Van Research and Training Hospital Department of Ophthalmology, Turkey.

Methods

The right eyes of 324 volunteers between the ages of 20 and 80, who applied to our ophthalmology outpatient clinic due to routine examination, were included. Exclusion criteria were ocular disease other than refractive error, any systemic disease, contact lens use, chronic ocular and systemic drug use, and previous ocular surgery. Central and 4 quadrants (superior, inferior, nasal, temporal) corneal sensitivity measurements were made with a Cochet-Bonnet esthesiometer (Luneau Ophthalmogia, France), without any topical premedication. Results were compared in terms of decade and gender.

Results

The mean age was 44.31±15.6(20-84), the F/M ratio was 165/159. The mean central, superior, inferior, nasal, and temporal quadrant sensitivities were 50.15±9.7, 48.62±10.3, 59±10.3, 47.73±10.2, 47.71±10.3, respectively. Sensitivities in all quadrants decreased significantly depending on age ($p<0.05$, for all quadrants). The decrease accelerated in the 5th and 6th decades. Gender-related changes were significant in the central and temporal quadrants($p=0.038$, 0.019, respectively). Sensitivity according to gender in each decade was significant in the 3rd and 5th decades. ($p<0.05$, for all quadrants)

Conclusions

With this study, for the first time in the literature, corneal sensitivity variation in terms of age and gender was revealed in healthy volunteers in Turkey. Corneal sensitivity decreased with age. The most significant decrease occurs in the 5th and 6th decades. Geographic location, UV exposure, as well as racial differences may affect corneal sensitivity.

Financial Disclosure of all authors

The authors have no relevant financial or nonfinancial interests to disclose.

Abstract #191

"Artificial Intelligence techniques for detection of dry eye disease"

A. Ioannou*[a], A. Mavroforou[a], E. Dardiotis[a], E. Tsironi[a]

[a] *UNIVERSITY OF THESSALY, Larissa, GREECE*

** Presenting author (katerina_ser@hotmail.com)*

Purpose

To sum up and to present the clinical applications of artificial intelligence in detection of dry eye disease.

Setting

University of Thessaly, school of Health Sciences, faculty of medicine, Larissa, Greece

Methods

This is a literature review and for this, two research databases namely ResearchGate and Google scholar were searched. The review involves research database searches technique using keyword searches technique, backward search of literatures referenced in the research paper under review and forward search of Google Scholar database of literatures citing the literature under review.

Results

There are many challenges regarding the detection, diagnosis and correct treatment for dry eye disease and artificial intelligence (AI) research is expected to grow in these areas of study. There are many techniques which use AI research in dry eye disease such as analyzation of the tear film, Meibomian gland assessment, blink pattern analysis. Since AI systems are capable of advanced problem solving, use of such techniques could lead to more objective diagnosis and treatment.

Conclusions

With new approaches finally being made in anterior segment disease, it is likely that AI in dry eye disease will provide more accurate diagnosis and treatment by giving insight into etiologies and factors that contribute to dry eye. Also there is a hope that dry eye AI tools will enter to clinical practice.

Financial Disclosure of all authors

There are no Financial interests to disclosure of all authors.

Abstract #192

Effect of Topical Insulin in Management of Refractory Persistent Epithelial Defects

P. Jain*[a], A. Hariani[b], I. Gupta[b], G. Reddy[b]

[a] *MAULANA AZAD MEDICAL COLLEGE, Gurugram, INDIA ;* [b] *GNEC, MAMC,DELHI, Delhi, INDIA*

** Presenting author (PJAIN811@GMAIL.COM)*

Purpose

Persistent corneal epithelial defects (PEDs) are difficult to treat and often refractory to conventional medical treatment. In this study we assessed the efficacy of topical insulin in treating persistent epithelial defects refractory to the usual medical treatment and determine its role in preventing further complications and need for surgical intervention.

Setting

A Prospective interventional study done in 20 patients ≥ 18 years age with PEDs due to following etiologies (neurotrophic keratitis, chemical or thermal burns, neuroparalytic, multiple sclerosis, diabetes mellitus, immune mediated, post corneal transplants) not responding to conventional treatment

Methods

Insulin eye drops (using regular insulin at concentration of 1 IU/ml) was prepared in a Polyethylene glycol base and started four times a day. Patients were followed up weekly till 1 month. Size of the epidefect, area in mm 2 and extent was measured at every visit

Results

Complete repithelisation was achieved in 100% of the patients. 91% (18 out of 20) complete repithelisation was achieved in 4 weeks. The mean length x height of the epidefect decreased from 4.6± 2.1 SD mm x 3.06 ± 1.8 SD mm to 0.5 ± 1.6 SD mm x 0.3±0.9 SD mm. The mean area decreased from 11.6 ± 11.28 SD mm 2 to 0.86 ± 2.7 SD mm 2 . The patients were followed up for 3 months post complete healing and stopping insulin drops with no recurrence of epidefect observed in the follow-up period.

Conclusions

Topical Insulin drops to treat PEDs refractory to usual medical management will pave way for an easily available, cost effective, non-invasive modality with a lower rate of infection, ease of handling and longer shelf life. We advocate the use of insulin eye drops as first line treatment for refractory PEDs.

Financial Disclosure of all authors

none

Abstract #193

Scleral contact lens in complex corneal situations in a tertiary eye center in India.

P. Jain[a], H. Avani[a], G. Isha[a], U. Sharma[a], C. Ogia[a], A. Soman[a], G. Reddy*[a]

[a] *GURU NANAK EYE CENTRE, DELHI., Delhi, INDIA*

** Presenting author (gahanreddya@gmail.com)*

Purpose

The purpose of this study is to showcase a myriad of complex scenarios where scleral contact lenses were used as a treatment choice in patients for better quality of vision and comfort.

Setting

Scleral contact lenses (SCLs) are wide-diameter, rigid, gas permeable systems that vault over the whole cornea. They are being used extensively to treat various ocular surface disorders and show potential in managing many conditions that until now could be managed only surgically.

Methods

This is a retrospective analysis of scleral contact lens fitting done in complex corneal situations in contact lens clinic in a tertiary eye center in Delhi, India.

Results

The most common indication for the use of scleral contact lenses in our setup was irregular astigmatism due to keratoconus not amenable to correction conventional lenses. Other complex situations that were corrected by SCLs included post radial keratotomy, post lasik ectasia, operated optical/ therapeutic penetrating keratoplasty, operated lamellar keratoplasty, surface irregularities like epithelial basement membrane dystrophy, pellucid marginal degeneration, terrien's degeneration, Salzmann nodular keratopathy, severe dry eyes, Steven johnson syndrome.

Conclusions

There has been a shifting trend to manage various degrees of irregular corneas due to varied etiology with scleral contact lens (SCLs) hence adopting a more conservative approach which is reversible and more acceptable to the patients. These lenses have become a useful tool in ocular surface abnormalities providing a protective interface as well as improving the visual acuity and quality of life.

Financial Disclosure of all authors

None of the authors have any financial disclosures to make.

Abstract #194

The efficacy of 0.18% versus 0.3% sodium hyaluronate in the treatment of ocular surface disease in glaucoma patients after trabeculectomy with mitomycin-C: a randomized clinical trial

C. Jitudomtham*[a], W. Kiddee[a]

[a] *PRINCE OF SONGKLA UNIVERSITY, Bangkok, THAILAND*

** Presenting author (Chalisa.ji@gmail.com)*

Purpose

To compare the efficacy of 0.18% vs 0.3% sodium hyaluronate (SH) in treating ocular surface diseases (OSDs) during the 60 days post-trabeculectomy.

Setting

Glaucomatous patients who underwent trabeculectomy with MMC in Prince of Songkla hospital

Methods

A prospective RCT of glaucoma patients who underwent trabeculectomy with mitomycin-C between May 2022 and June 2023. Of 40 cases, 19 eyes were randomized to receive 0.18% SH and 21 eyes to receive 0.3% SH one week after surgery.

Results

Both concentrations of SH cause significantly($P < 0.05$) improved the mean OSDI score compared to the baseline values. The improvement scores between groups were statistically insignificant. trabeculectomy with MMC causes a worsening in the corneal and conjunctival fluoresceine staining scores, especially during the first week of postoperative. The 0.18SH group shows a longer fluoresceine tear break-up time during the first 30 days, which reached the statistically significant at the 2-week follow-up. At 60 days, the 0.3SH group showed a significant improvement in FBUT compared to the 0.18SH group. Schirmer's I score improved, beginning two weeks after starting SH.

Conclusions

Both 0.18% and 0.3% SH preservative-free artificial tears effectively treated OSDs post MMC-trabeculectomy. 0.3% SH might have the better Schirmer's I score and FBUT at the end of the study. 0.18% SH has better FBUT in the first two weeks after surgery. The study has no data on tear osmolarity.

Financial Disclosure of all authors

none

Abstract #195

Increasing the Efficiency in Production of Amnion Membrane Extract and Ensuring Stabilization in the Lyophilization Process

SA. Kanbur*[a], M. Kocamanoglu[a], M. Gurdal[b], I. Korkmaz[a], M. Arici[a], N. Yildirim[a], O. Barut Selver[a]

[a] *EGE UNIVERSITY, Izmir, TURKEY ;* [b] *Limbustem R&D Medical Products Ltd, Izmir, TURKEY*

** Presenting author (akanbur8@gmail.com)*

Purpose

Amniotic membrane extract (AME) is a biologically based medical treatment product with a long shelf life that can provide high and constant amounts of growth factor support throughout treatment compared to amniotic membrane transplantation. It provides clinical effectiveness with its bioactive content. The aim of this study is to determine methods that preserve high bioactive content during the amniotic membrane extraction and lyophilization process.

Setting

To reduce variation, pools created from five human amniotic membranes were used. The extraction process was completed by applying the basic steps of pulverization, sonication, centrifugation and lyophilization to these pools. Protein concentration and growth factor analyzes were performed at the Ocular Surface Research Laboratory.

Methods

The effects of pH, filtration, protease inhibitors and lyoprotectants during the extraction process on the protein and growth factor amounts in the final product were investigated. Protein concentration was measured by BCA assay. Concentrations of growth factors (EGF, FGF, HGF, KGF, NGF and TGF-β) were measured by ELISA technique.

Results

The average protein concentration was found to be 2.52 mg/ml and no statistically significant difference was detected in the intra-group comparison. The positive effects of using isotonic salt buffer, protease inhibitor and lyoprotectant on obtaining higher growth factor levels were observed during the procedures. It was determined that filtering had a negative effect in this sense. The results of the currently ongoing experiment replications will be analyzed to obtain statistically significant results.

Conclusions

It is predicted that the effectiveness of AME in the treatment will be very high in proportion to the high protein and growth factors it contains. Procedures applied during the preparation of AME have a direct impact on the content of the product obtained, and it is important to take these into account during the optimization of the method.

Financial Disclosure of all authors

The authors have no relevant financial or nonfinancial interests to disclose. Author Seyfi Anil Kanbur declares that he has no confict of interest. Author Meltem Kocamanoglu declares that she has no confict of interest. Author Mehmet Gurdal declares that he has no confict of interest. Author Ilayda Korkmaz declares that she has no confict of interest. Author Mesut Arici declares that he has no confict of interest. Author Nuri Yildirim declares that he has no confict of interest. Author Ozlem Barut Selver declares that she has no confict of interest.

Abstract #196

Identification of The Relationship Between Topical Antiglaucomatous Agent Type and Conjunctival Fornix Depth

P. Kiyat*[a], ö. Barut Selver[b]

[a] İZMIR DEMOCRACY UNIVERSITY BUCA SEYFI DEMIRSOY TRAINING AND RESEARCH HOSPITAL DEPARTMENT OF OPHTHALMOLOGY, İzmir, TURKEY ; [b] EGE UNIVERSITY DEPARTMENT OF OPHTHALMOLOGY, Izmir, TURKEY

* Presenting author (pelinkiyat@hotmail.com)

Purpose

The aim of the study is to determine the upper and lower conjunctival fornix depths of patients receiving topical beta-blockers or prostaglandins with BAK as monotherapy due to primary open-angle glaucoma and to compare the findings with each other and with healthy individuals.

Setting

Forty-eight patients receiving topical beta-blockers or prostaglandins with BAK as monotherapy due to primary open-angle glaucoma were included in the study. The fornix depth measurements were performed in İzmir Democracy University Buca Seyfi Demirsoy Research and Training Hospital Department of Ophthalmology.

Methods

The number of volunteers in each group was 24, and the left eyes of all volunteers were included in the study. Patients who had been using topical antiglaucomatous monotherapy for at least 3 years were included. Patients with any history of eyelid or ocular surface surgery or trauma were excluded from the study. Fornix measurements were performed for the upper and lower fornixes using Moorfields conjunctival fornix depth measurer which is a validated PMMA material fornix depth gauge. The results were compared among themselves and with the results of age- and gender-matched healthy individuals.

Results

The upper and lower mean conjunctival fornix depths in topical beta blockers users, topical prostaglandin users and the control group were 15.1 (13-18) mm and 8.8 (7-11) mm; 14.9 (13-17) mm and 8.5 (6-11) mm; 15.5 (13-18) mm and 9.7 (8-12) mm, respectively. The upper fornix measurements were lower in the beta-blockers and the prostaglandins group when compared to healthy individuals however the difference was not statistically significant (p=0.288). The lower fornix measurements were lower in the Beta-blockers and the prostaglandins group, when compared to the control group, however the difference was statistically significant in the prostaglandins group only. (p=0.0095)

Conclusions

Topical medications for glaucoma, or the preservatives, used for 3 years or longer, are known to be associated with conjunctival shrinkage. It is also known that prostaglandin analogues can induce subclinical inflammation. It is important to analyze whether this inflammation is higher than inflammation caused by other topical agents. In this sense, the findings of this study support this issue.

Financial Disclosure of all authors

The presenting author and the co-author declare no conflict of interest.

Abstract #197

The effects of applying specific skin lipids on the human tear film.

J. Kokkinakis[a]

[a] *EYE PRACTICE, THE, Sydney, AUSTRALIA*

Purpose
The effect of specific skin lipids on the formation and stability of the human tear film was investigated.

Setting
Three volunteers with no signs or symptoms of ocular surface disease were used in a tertiary referral centre.

Methods
Commercially available specific skin lipids (various examples of fatty acids, FAs; a wax ester, WE; squalene, Sq, and aged Sq; cholesterol (Ch); and a ceramide) were applied to the eyes of volunteers and studied using fluorescein or with TearView, which dynamically records infra-red emissivity showing tear film integrity in real-time.

Results
Different lipids were observed upon application to the ocular surface. FAs, Sq and aged Sq all spread out from the area of application, whereas Ch, the WE and ceramide did not. FAs and aged Sq caused pain, and a blink showed that for FAs the site of application was stained which differed from aged Sq where the area of spread was stained. This pain and staining pattern associated with aged Sq closely resembled that observed when applying skin swabs. Ch, the WE and the ceramide did not cause pain when applied and a blink dispersed them into the tear film.

Conclusions
FAs and aged Sq disrupted the tear film, caused pain and staining of the ocular surface with the aged Sq closely resembling what happened if skin swabs were applied to the ocular surface. It is likely that aging of Sq caused it to oxidise. Therefore if skin lipids have access to the ocular surface, it is likely that oxidized Sq will disrupt the tear film, damage the ocular surface and cause pain, with some contribution from FAs to this process.

Financial Disclosure of all authors
None

Abstract #198

Corneal involvement in pediatric ocular rosacea: Case series.

R. Limaiem*[a], A. Hassairi[a], I. Hachicha[a]

[a] *INSTITUTE OF OPHTALMOLOGY OF TUNIS HEDI RAIES, Tunis, TUNISIA*

** Presenting author (rlimaiem@yahoo.fr)*

Purpose

The purpose of this study is to describe the clinical presentation of pediatric ocular rosacea and to report our experience in managing this condition.

Setting

Ocular rosacea is a rare inflammatory condition, often underdiagnosed in children, particularly in the absence of associated cutaneous signs. Clinical manifestations of ocular rosacea vary and can range from simple blepharoconjunctivitis to corneal lesions that impair visual function.

Methods

The medical records, including slit-lamp examination, anterior segment photography, and meibography, of patients diagnosed with pediatric ocular rosacea without cutaneous signs over a period of 24 months, were reviewed retrospectively. Five participants were included. Data analysis focused on exploring the clinical presentation and corneal manifestations of ocular rosacea, as well as evaluating therapeutic approaches and disease progression.

Results

Ten eyes of five children, with an average age of 5 years, were included. The diagnosis was delayed by an average of 8 months from the onset of initial symptoms. Ophthalmic examination revealed conjunctival hyperemia in 5 eyes, meibomian gland dysfunction in all eyes, and chalazion in 3 eye. Superficial punctate keratitis was noted in 3 cases, phlyctenular keratoconjunctivitis with vascular involvement in 4 cases, and episcleritis in one case. Topical azithromycin combined with artificial tears and eyelid hygiene were prescribed. Macrolides were indicated in 3 cases. The outcome was favorable, although recurrences were observed in 3 patients.

Conclusions

Ocular rosacea is a chronic inflammatory disorder characterized by periods of exacerbation and remission, often underdiagnosed in children. Corneal involvement, though less common, can be severe. Diagnosing pediatric ocular rosacea is challenging and should be considered in the presence of any ocular surface disease. Treatment is challenging due to the lack of effective long-term therapeutic options. Early detection and vigilant monitoring are crucial to prevent functional complications, particularly in children.

Financial Disclosure of all authors

No financial disclosure.

Abstract #199

Corneal tattooing: keratopigmentation as a cosmetic treatment for disfiguring opacified corneas

L. Magalhães*[a], L. Crepaldi[a], G. Madeira[a], I. Coelho[a], R. Maciel[a], L. Ferreira[a], B. Trindade[a]

[a] *INSTITUTO DE OLHOS CIÊNCIAS MÉDICAS, Belo Horizonte, BRAZIL*

** Presenting author (larissalimam@gmail.com)*

Purpose

To report the outcomes of keratopigmentation in cases of aesthetic complaints due to chronic unilateral total corneal opacity and the perception of patients about the effectiveness of corneal tattooing for the cosmetic improvement of their eyes with leukoma.

Setting

Tertiary university public hospital.

Methods

Five eyes of patients with total corneal opacification with visual acuity of light-perception or no light perception were included. They were all contact-lens intolerant or unwilling to use a cosmetic contact-lens. Corneal tattoo was performed by applying a medical-grade tatoo dye into a manually-dissected pocket in the corneal stroma. In all patients, a deeper (250-350µm) pocket was created and filled with a dark brown dye to simulate the iris and a shallower (150-200µm) 3.5 mm-central circular pocket was filled with black dye to simulate the pupil. The main outcomes were surgical complications, pigment stabilization, postoperative patient's cosmetic appearance and discomfort.

Results

The mean follow-up time was 4-12 months. All patients werevery satisfied with the cosmetic results and reported significant improvement in self-esteem and social well-being.80% of patients said they had little postoperative discomfort, while 20% reported moderate discomfort. No ocular or corneal complications occurred during or after surgery. Minimal pigment loss was seen in 2 patients, but the cosmetic results were satisfactory, and no secondary surgical procedures were required one year after surgery in any of the patients.

Conclusions

Keratopigmentation can be an alternative method to contact lenses and ocular prostheses in impaired eyes with corneal opacities. It can bring satisfactory and long-lasting cosmetic improvement that can enhance social acceptance for these patients.

Financial Disclosure of all authors

All authors declare no financial disclosure.

Abstract #200

Looks can be deceiving: atypical presentation of Terrien's Marginal Degeneration

L. Magalhães*[a], L. Crepaldi[a], L. Ferreira[a], B. Trindade[a]

[a] *INSTITUTO DE OLHOS CIÊNCIAS MÉDICAS, Belo Horizonte, BRAZIL*

** Presenting author (larissalimam@gmail.com)*

Purpose

To report the case of a patient with Terrien's Marginal Degeneration (TMD) of atypical location simulating Pellucid Marginal Degeneration (PMD) in corneal topography.

Setting

Tertiary university public hospital.

Report of case

Male, 64 years old, wearing multifocal lenses, complains of poor visual acuity. Corrected visual acuity in both eyes was 1.0 with high cylinders. Biomicroscopy showed mild conjunctival hyperemia, increasing inferior circumferential stromal thinning of the peripheral cornea from 3 to 9 o'clock bilaterally with the presence of a lipid deposit and an area of preserved corneal tissue at the junction with the limbus. The epithelium was intact and a pseudopterygium was noted in the superior nasal region of the left eye. Corneal topography showed OD: K1 42.09(180°), K2 41.44(90°); OE: K1 43.13(166°), K2 40.22(76°) and PMD pattern. Corneal optical coherence tomography showed thinning of the inferior peripheral cornea, confirming stromal thinning with intrastromal lipid deposits and the presence of an intact epithelium. Laboratory tests were normal, ruling out rheumatologic and infectious causes. In view of the findings, a diagnosis of TMD was made, corrective lenses were prescribed, and the patient was advised of the progressive nature of the disease and the importance of follow-up. The condition remains stable and, despite the corneal involvement, it was decided to adopt an expectant approach with six-monthly follow-up.

Conclusion/Take home message

The differential diagnosis of corneal thinning in peripheral can prove challenging, especially in atypical cases, but is of fundamental importance for correct therapeutic approach and follow-up. TMD is a rare bilateral peripheral corneal ectasia typically located in the superior nasal region. In this case, the atypical location of the thinning causes changes suggestive of PMD. However, classic features such as the presence of lipid deposits, opacities, neovascularization, and intact epithelium support the diagnosis of TMD. This case reinforces the importance of the ophthalmic examination and clinical history in the differential diagnosis.

Abstract #201

Primary Conjunctival Basal Cell Carcinoma Mimicking an OSSN in a Young Adult Filipino: A Case Report and Literature Review

LJ. Mangahas*[a], R. Siazon[b]

[a] *ILOCOS TRAINING AND REGIONAL MEDICAL CENTER, San Fernando City, PHILIPPINES ;* [b] *ILOCOS TRAINING AND REGIONAL MEDICAL CENTER, San Fernando, PHILIPPINES*

** Presenting author (lorenzjacobm@gmail.com)*

Purpose

To describe the morphologic and histopathologic features of a Primary Conjunctival Basal Cell Carcinoma (BCC) in a young adult Filipino.

Setting

This is a case of a Young Filipino Male seen in the Outpatient Department of Ilocos Training and Regional Medical Center, a Tertiary Hospital, in San Fernando, La Union, Philippines last November 2022.

Report of case

A 37/M with a three-year history of progressively enlarging fleshy, pedunculated mass on his right eye measuring 8.5mm x 8.0mm at the superonasal limbus encroaching on the cornea, with surrounding prominent feeder vessels. Whitish-to-grayish plaques typically seen in OSSN were noted on the lesion's surface. Wide excision of the mass with no touch technique was done under local anesthesia. Four cycles of Mitomycin-C 0.04% as chemo-adjuvant therapy were given. Histopathology showed basaloid cells with peripheral palisading most consistent with BCC. Immunohistochemistry was positive for Bcl-2 and CD10 markers and negative for EMA and CEA, confirming conjunctival BCC. Eight weeks postoperatively, fibrovascular tissue proliferation at the excision site was noted. AS-OCT of the lesion showed a thickened hyper-reflective band continuous with the epithelium making us suspect of a possible recurrence. Resection with a rush frozen section revealed the presence of fibrotic tissue and was negative for tumor cells. The bare sclera was covered with conjunctival autograft. There was no recurrence of the lesion after three months of follow-up.

Conclusion/Take home message

Primary BCC of the conjunctiva is rarely encountered, especially in a young male mimicking squamous neoplasia both in morphology and histopathology. Therefore, it should be considered in the differential diagnosis of OSSN. Immunostaining is invaluable for distinguishing between the two and confirming the diagnosis. Wide surgical excision is sufficient, as reported in the literature. Although lacking in evidence, adjunctive therapies may help prevent tumor recurrence.

Abstract #202

Impact of storage conditions on epithelial barrier of ex vivo human corneas stored in active storage machine.

M. Mentek*[a], S. Urbaniak[a], B. Peyret[a], E. Crouzet[a], JM. Papillon[a], P. Gain[a], G. Thuret[a]

[a] *LABORATOIRE BIIO, Saint-Etienne, FRANCE*

** Presenting author (marielle.mentek@univ-st-etienne.fr)*

Purpose

The storage of human corneas in active storage machine (ASM, restoring IOP and medium renewal) allows regenerating a mature and highly physiological corneal epithelium. Human corneas stored in ASM thus represent an interesting surrogate and physiological model to explore transcorneal drug penetration and absorption. This model would allow the use of human corneas discarded by eye banks (not suitable for transplantation) and would help reducing the number of animals used for corneal pharmacokinetic studies. Aim: to explore the impact of different storage conditions on the permeability and markers of epithelial barrier of *ex vivo* human corneas.

Setting

Basic experimentation conducted in our university laboratory Biology, engineering and imaging for Ophthalmology (BiiO, St-Etienne). Human corneas unsuitable for transplantation were used. They were stored in organ culture (OC) in CorneaMax (Eurobio, les Ulis, France) for a maximum of 2 weeks before experimentation.

Methods

We studied corneas stored for 2 weeks in 4 conditions: conventional OC, OC on agar poured on the endothelial side (Agar), ASM with continuous flow of CorneaMax(ASM-CMx) or with airlifting (alternate exposure to air and liquid) with supplemental hormonal epithelial medium, a reference medium epithelium (ASM-AL-Shem). Corneal thickness was measured by OCT. Permeability of epithelial barrier was assessed by calculating the apparent permeability (P_{app}) of fluorescein over a 5-hour diffusion. Transepithelial electrical impedance was assessed using a custom device. The expression of ZO-1, claudin 1, occludin, E-Cadherin, actin and CK3 was assessed by immunolabelling and by Simple Western.

Results

ASM storage significantly decreased corneal thickness by 220 ± 130 µm (-32%, ASM-CMx) and by 247 ± 137 µm (-37%, ASM-AL-Shem). Corneal permeability to fluorescein allowed to classify storage conditions from the highest to the lowest permeable model: 4-week OC (P_{app}= 2.79E^{-6} ± 5.3E^{-7} cm/sec) > ASM-CMx (P_{app}=2.1E^{-6} ± 1.9E^{-6} cm/sec) > 2-week OC (P_{app}=1.53E^{-6} ± 7.0E^{-7} cm/sec) > ASM-AL-Shem (P_{app}=1.05E^{-6} ± 8.1E^{-7} cm/sec) > Agar (P_{app}=8.8E^{-7} ± 2.9E^{-7} cm/sec). Transepithelial electrical impedance was not efficient to explore the impact of storage conditions on corneal epithelial barrier. Epithelial barrier markers expression supported a variable response to storage parameters among corneas.

Conclusions

Our results showed 1/ the air-epithelium interface seems to play the major role in the restoration of a physiological corneal epithelial barrier in comparison to the other parameters (corneal endothelium-epithelium communication, endothelial function and corneal thickness restauration, storage medium composition) 2/ response to a storage condition is variable among corneas (donor and post mortem delay parameters difficult to normalize) and will play a crucial role in the validation of a pharmacological model using human corneas. Further studies are necessary to fully understand the impact of storage parameters and to optimize the restoration of human corneal epithelium in ASM.

Financial Disclosure of all authors

Financial Disclosure of all authors: PG and GT patented the ASM. The other authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this abstract.

Abstract #203

Characterising Mirvetuximab-induced ocular surface disease

YN. Neo*[a], S. Ahmad[a]

[a] *MOORFIELDS EYE HOSPITAL NHS FOUNDATION TRUST, London, UNITED KINGDOM*

** Presenting author (yneo@nhs.net)*

Purpose

Mirvetuximab soravtansine (MIRV) is the first antibody-drug conjugate targeting folate receptor alpha recently approved for use in advanced platinum-resistant ovarian, fallopian tube or primary peritoneal cancer and is rapidly gaining popularity. This study aims to report the clinical features, treatment strategies and outcomes of MIRV-induced ocular surface disease.

Setting

Tertiary referral centre at Moorfields Eye Hospital NHS Foundation Trust, London.

Methods

Ten patients were included from August 2017 to October 2023. Ocular symptom assessment and comprehensive ophthalmic examination, including slit lamp biomicroscopy, anterior segment optical coherence tomography (AS-OCT), and confocal microscopy were performed.

Results

All patients were female treated for advanced ovarian cancer (mean age 66.7±5 years). Seven (70%) had grade 1-2 superficial punctate keratopathy. Five (50%) developed bilateral mid-peripheral microcystic subepithelial opacities, two of which progressed to involve the central cornea. AS-OCT confirmed the corneal opacities were limited at the subepithelial layer. Confocal microscopy demonstrated a rosette pattern for these subepithelial opacities. Two required MIRV dosage reduction due to ocular adverse events. No discontinuation of MIRV was necessary. Ocular surface and corneal changes resolved with recovery to baseline best corrected visual acuity for all patients.

Conclusions

Dry eyes and microcystic subepithelial changes were the commonest MIRV-induced ocular adverse events but these were transient and reversible. We hypothesize the insult and centripetal migration of transient amplifying cells (TACs) to be responsible for the pathogenesis but further investigation is required. Prophylactic use of topical corticosteroid which delays TACs migration is recommended for all patients starting on MIRV. MIRV dosage reduction for patients with more severe ocular surface disease resulted in good resolution of symptoms.

Financial Disclosure of all authors

All authors declare no financial interests relevant to the study.

Abstract #204

Effects of using artificial illumination with LED's on the cornea and ocular surface

KH. Or*[a]

[a] *PRIVATE, Hamburg, GERMANY*

** Presenting author (hilmi.or@gmail.com)*

Purpose

Until one decade ago all the artificial enemy illumination was about incandescent of fluorescent bulbs. Nowadays most of the artificial illumination is converted to LED's all over the world. The effects of of this change on the cornea and ocular surface are evaluated.

Setting

Technical specification of light sources and their effects on the cornea, tear film and ocular surface are evaluated.

Methods

LEDs and older light sources are compared for differences. Their effects on the cornea, tear film and the ocular surface are discussed.

Results

LED's emit only visible electromagnetic radiation. All the older illumination techniques and devices emitted not only visible light but also ultraviolet and/or infrared radiation. With the older devices ultraviolet had possible hazardous effects on the cornea and conjunctiva tissues. Infrared radiation caused the increased vaporization of the tear film on the cornea and conjunctiva. This effects could be seen intensively when the light sources were relatively close to the eyes. Because the LEDs don't emit any ultraviolet and infrared radiation, there are no such effects on the cornea and ocular surface.

Conclusions

Generalized use of LED's for artificial illumination has positive effects on the cornea and ocular surface, because they emit only visible electromagnetic wavelengths.

Financial Disclosure of all authors

No financial disclosures.

Abstract #205

Belantamab Mafodotin associated keratopathy - Case Report

A. Oreaba*[a]

[a] *LEICESTER UNIVERSITY HOSPITALS NHS TRUST, Leicester, UNITED KINGDOM*

** Presenting author (dr.oreaba@hotmail.com)*

Purpose

Belantamab mafodotin represents an innovative treatment for refractory or relapsing multiple myeloma. Despite encouraging clinical outcomes, the emergence of ocular toxicity raises significant concerns, necessitating dose adjustments or discontinuation. This report outlines the clinical manifestations and management of Belantamab mafodotin-related keratopathy.

Setting

The study was conducted at the Ophthalmology Department of Leicester University Hospitals - United Kingdom.

Report of case

A 74-year-old male underwent ocular assessment before receiving an intravenous infusion of Belantamab mafodotin for refractory multiple myeloma. Initial evaluation showed uncorrected visual acuity of 0.1 LogMAR in the right eye and 0.2 LogMAR in the left eye, with an unremarkable ocular examination. Subsequently, the patient received the first dose of Belantamab mafodotin. The patient was advised to use sodium hyaluronate 0.2 four times daily for both eyes before and after the treatment.

Biweekly reviews post-infusion revealed that, on week 2 and week 4, the patient experienced increased blurriness and dry eye like symptoms particularly in the left eye. Assessments demonstrated a significant decline in visual acuity to uncorrected vision of 0.5 LogMAR in the right eye (corrected to 0.2 LogMAR with pinhole) and 0.64 LogMAR(corrected to 0.3 LogMAR with pinhole) in the left eye. Ocular examination revealed bilateral superficial punctate microcystic epithelial deposits grade 1 in the right eye and grade 2 in the left eye. In liaison with the hematology oncologist, the decision was made to postpone the second dose due to evidence of ocular toxicity. Two weeks later, the keratopathy improved to less than grade 1 in the right eye and grade 1 in the left eye. Therefore, Belantamab mafodotin second infusion was resumed.

Conclusion/Take home message

Belantamab mafodotin-related keratopathy presents a significant dose-dependent adverse event that may result in vision deterioration in multiple myeloma patients receiving this emerging treatment. Timely recognition, along with appropriate dose spacing and adjustments, is crucial for minimizing the risk of permanent ocular toxicity and visual loss.

Abstract #206

Post-Traumatic Subconjunctival Emphysema: Regarding Two Cases

M. Puchol-Rizo*[a], L. Alcalde-Blanco[a], T. García-Herrera Prada[a], D. Rojas-Correa[a], J. Fernández-Rodríguez[a], E. Puertas-Martínez[a], D. Burón[a]

[a] *HOSPITAL 12 DE OCTUBRE, Madrid, SPAIN*

** Presenting author (martinpucholrizo@gmail.com)*

Purpose

This study aims to comprehensively investigate and analyze two clinical cases of post-traumatic subconjunctival emphysema linked with orbital fractures. The focus is on cases treated at the Ophthalmology Emergency Department of the 12 de Octubre University Hospital, delving into the diagnostic procedures, treatments, and outcomes associated with this condition.

Setting

Ophthalmology Emergency Department of the 12 de Octubre University Hospital, involving males with post-traumatic subconjunctival emphysema due to orbital fractures

Methods

This study involves detailed examinations of two male patients presenting with post-traumatic subconjunctival emphysema following orbital trauma. Diagnostic assessments include visual acuity (VA), slit lamp examinations, fundoscopy, extraocular movements (EOMs), and computed tomography (CT) scans to confirm orbital fractures. Surgical interventions, when necessary, and conservative treatments with artificial tears were administered and monitored.

Results

Initial examinations revealed signs of subconjunctival emphysema in both cases, accompanied by symptoms like palpebral edema, ecchymosis, and enophthalmos. CT scans confirmed orbital fractures in both patients, with differing fracture patterns. Surgical intervention was required in one case, while conservative treatment sufficed in the other. Subconjunctival emphysema resolved without complications in both instances.

Conclusions

Post-traumatic subconjunctival emphysema presents as an indicative factor of orbital fracture, emphasizing the importance of thorough examination and prompt imaging for accurate diagnosis. Conservative management showed successful outcomes. Early identification of orbital emphysema is crucial to prevent potential complications, highlighting the significance of CT imaging in evaluating traumatic orbital injuries.

Financial Disclosure of all authors

There are no financial disclosures

Abstract #207

Happy New Year: Firework-Induced Corneal Laceration

M. Puchol-Rizo*[a], L. Alcalde-Blanco[a], T. García-Herrera Prada[a], J. Fernández-Rodríguez[a], A. Iribarra-Fermandois[a], E. Puertas-Martínez[a], D. Burón[a]

[a] *HOSPITAL 12 DE OCTUBRE, Madrid, SPAIN*

** Presenting author (martinpucholrizo@gmail.com)*

Purpose

This case report aims to detail a not so rare instance of a pediatric corneal injury caused by fireworks, highlighting the injury's severity, management and subsequent visual outcomes. By sharing this case, we aim to raise awareness about the dangers of fireworks and emphasize the importance of eye protection during festive celebrations, especially for children.

Setting

The incident took place exactly the first minutes of year 2024, being admitted at the emergency department of Hospital 12 de Octubre at 00.15h of 1st January 2024. The child, aged 13, sustained a corneal laceration from a firework explosion.

Report of case

The patient, an 8-year-old boy, presented with a firework-induced corneal laceration. The injury occured during a New Year's Eve celebration when a firework exploded in close proximity to the child. He experienced immediate pain, tearing, and reduced visual acuity in the affected eye. Upon examination, a full-thickness corneal laceration, approximately 5 mm in length, was identified.

Under general anesthesia, meticulous exploration and debridement of the wound were performed. The corneal laceration was meticulously approximated and sutured using 10/0 nylon in a single-layer closure, empoloying around eight simple sutures and a single triangle suture. We should highlight the fact that not the whole wound was penetrating, which concerned the treaetment. Postoperative care included topical antibiotics and steroids to prevent infection and inflammation.

Due to the nature of the injury, ongoing monitoring for potential long-term complications, such as corneal scarring and irregular astigmatism, is necessary.

Conclusion/Take home message

This case underscores the grave consequences of firework-related injuries, particularly in pediatric population. Despite prompt management, the risk of vision-threatining complications remains. Prevention through public education regarding firework safecty, emphasizing protective eyewear and implementing stricter regulations concerning firework usage is paramount. By sharing this case, we urge for proactive measures to minimize the indicence of these ocular injuries during festive events.

Abstract #208

Management of an aggressive Conjunctivo-adnexal squamous cell carcinoma

M. Ray*[a], C. Chai[a]

[a] *NATIONAL UNIVERSITY HOSPITAL, SINGAPORE, Singapore, SINGAPORE*

** Presenting author (ophrm@nus.edu.sg)*

Purpose

To report a case of aggressive conjunctivo- adnexal tumor that was managed successfully with titrated surgical approach and topical chemotherapy who was advised to undergo orbital exenteration elsewhere.

Setting

Ocular oncology service, National University Hospital, Singapore

Report of case

68-year-old Chinese gentleman presented with a suspicious lesion in left upper tarsal conjunctiva in 2016. Excision biopsy revealed a squamous cell carcinoma. He was further treated partially with adjuvant chemotherapy to which he was intolerant. Thereafter, he underwent multiple surgery including excision, lid reconstruction and full thickness skin graft both in Singapore and UK. Eventually he was advised to undergo orbital exenteration in view of treatment failure. At this point, the patient consulted our oncology service at NUH, Singapore. We performed 16 point conjunctival and eye-lid biopsy which again came positive for squamous cell carcinoma. A MRI and PET scan excluded and orbital or distant body metastasis. We resumed topical interferon-α2b (1MIU/ml) four times a day along with topical retinoic acid for 5 months. A repeat 16 point conjunctival and adnexal biopsy performed after the end of the treatment. There was no evidence of squamous cell carcinoma.

Conclusion/Take home message

Meticulous investigation and titrated surgical approach along with judicious topical chemotherapy can save the globe in aggressive conjunctivo-adnexal squamous cell carcinoma

Abstract #209

A biosynthetic alternative to human amniotic membrane for use in ocular surface surgery

P. Sahay*[a], HS. Dua[a], M. Behbehani[b], P. Filippini[a], G. Bruti[b], M. Townsend[b], R. Mckean[b]

[a] *The University of Nottingham, Nottingham, UNITED KINGDOM ;* [b] *The Electrospinning Company Ltd., Oxfordshire, UNITED KINGDOM*

** Presenting author (prity.sahay@nottingham.ac.uk)*

Purpose

The purpose of this study was to assess the physical and biological properties of biosynthetic and biodegradable Symatix® membrane (SM®) alternatives to replace fresh human amniotic membrane (hAM) in ocular surgical applications.

Setting

This scientific study involved human corneas and primary limbal epithelial cells cultured from human limbal explants for different experiments in the laboratory.

Methods

Different physical properties of 20µM thickness and 1 x 9mm disc in diameter of SM® were tested *ex-vivo* by simulation on human corneas. *In-vitro*, primary human limbal epithelial cells from limbal explants were used to test biological properties like cell migration, proliferation, metabolic activity, and limbal epithelial cell properties on SM®, hAM, freeze-dried amniotic membrane (FDAM), and plastic as comparators.

Results

The surgical handleability of SM® was equivalent to hAM and FDAM. Ultrastructural and histological studies demonstrated that epithelial cells on SM® had the typical tightly apposed, polygonal, and corneal epithelial cell morphology. The epithelial cells were well stratified on SM®, unlike hAM, and FDAM. Rapid wound healing occurred on SM® within 3 days. Ki-67 revealed increased progressive proliferation, and increased metabolic activity on SM®. Immunofluorescence studies showed positive expression of cytokeratin-19 (CK-19), collagen-1 (col-1), laminin, zonula occludens-1 (ZO-1), fibronectin (FN), and p-63 on SM®.

Conclusions

The hAM, currently widely used in ocular surface surgery, has numerous variations and limitations. These results indicate that SM® is a better substrate for limbal epithelial cell migration, proliferation, and tight junction formation. The biocompatibility of corneal epithelial cells with the SM® demonstrated in this study can provide a suitable viable alternative to hAM for surgical application in sight-restoring operations.

Financial Disclosure of all authors

Prity Sahay, Mehri Behbehani, Perla Filippini, Gianpaolo Bruti, Melissa Townsend, Rob McKean - None
Harminder Singh Dua - Consultant to Arctic Vision, Thea Pharmaceuticals, and the Electrospinning company; and shares in NuVision biotherapies and GlaxoSmithKline.

Abstract #210

Comparison of Corneal Topographic and Ocular Surface Parameters of Ocular Rosacea Patients According to Different Skin Subtypes

O. Saritas*[a], N. Yesilirmak[b], JL. Bourges[c]

[a] *Battalgazi State Hospital, Ankara, TURKEY ;* [b] *Department of Ophthalmology, Ankara Yildirim Beyazit University, Ankara Bilkent City Hospital, Ankara, Turkey, Ankara, TURKEY ;* [c] *Ophthalmopole, Cochin Hospital, Assistance Publique-Hôpitaux, Paris, FRANCE*

** Presenting author (ozzgesaritass@gmail.com)*

Purpose

To evaluate the corneal topographic and ocular surface parameters of ocular rosacea (OR) patients across different skin subtypes of the disease, as well as to compare these parameters to those of healthy controls.

Setting

This prospective, cross-sectional study included eyes of OR patients and healthy individuals. The local ethics committee of Ankara City Hospital approved the study.

Methods

Study included 180 eyes of 90 OR patients and 60 eyes of 30 healthy controls. Of the patients, 30 had phymatous (60 eyes), 30 had erythematotelangiectatic (60 eyes) and 30 had papulopustular skin type (60 eyes). Mean keratometry (Kmean), maximum keratometry (Kmax), thinnest corneal thickness (TCT), central corneal thickness (CCT) and corneal volume (CV) parameters were measured using a topography device. Tear break-up time (TBUT), Schirmer, Meiboscore and ocular surface disease index (OSDI) scores were recorded from all participants.

Results

Kmean and Kmax values were significantly higher in OR than controls ($p<0.05$). When evaluating in subgroups, we found higher Kmean and Kmax values in papulopustular and phymatous subtypes compared to erythematotelangiectatic subtype and controls ($p<0.05$). CCT value was significantly lower in papulopustular subtype compared to phymatous and erythematotelangiectatic subtypes and controls, while TCT value was significantly lower in papulopustular subtype compared to controls ($p<0.05$). There were significant negative correlations between “Kmax-CV” and “Kmax-TCT” only in papulopustular subtype ($p<0.05$). TBUT was significantly lower in phymatous subtype, while meiboscore was significantly higher in papulopustular subtype compared to other types and controls ($p<0.05$).

Conclusions

There are seemingly inflammation related differences in corneal topography in OR patients compared to controls,and these changes appear to be more prominent in papulopustular and phymatous skin types. Our clinical findings also support this conclusion. Further studies investigating the relationship of inflammatory markers with topography parameters in each skin subtype of OR patients will help further elucidate our findings.

Financial Disclosure of all authors

No potential conflict of interest was reported by the author(s).

Abstract #211

Corneal toxicities realated with novel cancer treatments

T. Shukair Harb*[a]

[a] *HOSPITAL UNIVERSITARIO MADRID NORTE SANCHINARRO, Madrid, SPAIN*

** Presenting author (tamara.shukair@gmail.com)*

Purpose

The use of new drugs for the treatment of cancer has produced new toxicities. The purpose of this study is to evaluate the corneal side effects of clinical trials with targeted therapies against cancer.

Setting

Retrospective study in a reference hospital in Madrid

Methods

90 patients with advanced cancer have been evaluated, undergoing a clinical trials with a type of molecule involved in the growth and progression of the tumor to assess ocular toxicity through complete ophthalmological examinations in each treatment cycle.

Results

30 patients (30%) were referred to the ophthalmology clinic with any corneal toxicity complained of progressive visual acuity deterioration after the development of corneal lesions.

Most of pateints have had keratitis and corneal deposits with a ring appearance and a clear central cornea, modifying the curvature and refractive situation, and in some cases with the appearance of keratoconus in the corneal topography.

Anothers have had microcyst-like epithelial keratopathy and dry eye. A small grup have had Vortex keratopathy- like.

Side effects may be treated with topical corticosteroids, artificial tears, or topical cyclosporin.

Conclusions

Corneal complications due to new targeted cancer therapies are important.

They appear to be transient, but may persist during treatment.

In the absence of greater follow-up and a greater number of cases, a follow-up and treatment protocol for this type of patient remains to be established.

Financial Disclosure of all authors

No

Abstract #212

COMPARISON BETWEEN COMBINED ORAL DOXICICLINE + INTENSE PULSED LIGHT VS NON COMBINED STRATEGY IN THE TREATMENT OF REFRACTORY CHRONIC MEIBOMIAN GLAND DYSFUNCTION. A PROSPECTIVE COHORT STUDY.

A. Strianese*[a], V. De Ruvo[a], A. Di Filippo[a], S. Zappa[a], LM. Rossetti[a], P. Fogagnolo[a]

[a] *University of Milan - Ospedale San Paolo, Milano, ITALY*

** Presenting author (alfonsostrianese95@gmail.com)*

Purpose

Several treatments are currently available for Meibomian gland disfunction (MGD) but no standard protocols have been sufficiently validated so far. Oral and local antibiotics have been successfully used, as well as intense pulse light (IPL). The literature shows that both antibiotics and IPL reduce lids inflammation and cellular turnover of Meibomian cells and that they can be safely combined, as IPL wavelength doesn't interact with the photosensitizing tetracyclines. The purpose of this study is therefore to evaluate the efficacy and the safety of a combined IPL + systemic doxycycline treatment in cases of chronic MGD refractory to first line treatment.

Setting

This is a spontaneous , non-randomized, monocentric (ASST- Santi Paolo e Carlo, Università degli studi di Milano, Italy), prospectic, phase IV study.

Methods

A cohort of 100 patients with chronic MGD at baseline (refractory after at least 2 months of first line treatment with meibomian gland expression and artificial tears) was treated with combined treatment with systemic doxycycline (low dose protocol - LDD- 50 mg pro die for 3 months) and IPL or non combined treatment (Group 1: LDD + IPL , Group 2: LDD, Group 3: IPL). Low tech and High tech parameters (Oculus keratograph) were collected at baseline, 3 and 6 months. OSDI score was administered at each visit. Adverse effect (AE) was also collected

Results

OSDI score significantly improved in all groups, but patients using a combined treatment had more frequently a clinically significant improvement of 7 or more points at OSDI score (p=0.04) . Also TBUT and high-tech significantly improved in all groups. AE related to the doxycycline treatment (list of the main AE) occurred in 7.5%; no AE due to the combination of doxycycline and IPL was reported. No significant differences between two groups have been found in this follow up.

Conclusions

Combined IPL - systemic doxycycline is a safe and effective treatment for refractory MGD leading to a clinically significant improvement of symptoms in 82.7 % of cases. More studies will be necessary to confirm a possible superiority to other current treatments for MGD.

Financial Disclosure of all authors

The authors declare that they have no affiliations with or involvement in any organization or entity with any financial interest in the subject matter or materials discussed in this manuscript.

Abstract #213

Ocular findings in X-linked ichthyosis - A case report .

IH. Touahir*[a]

[a] *HOSPITAL OF OPHTHALMOLOGY OUARGLA, Ouargla, ALGERIA*

** Presenting author (ikramtouahir@gmail.com)*

Purpose

X-linked ichthyosis is a rare skin disease belonging to the Mendelian Disorders of Cornification (MeDOC), characterized by generalized hyperkeratosis and skin scaling. Ocular damage during X-linked ichthyosis is very common, mainly in the anterior segment such as: Ectropion, blepharitis, conjunctivitis, dry eye, Superficial punctate keratitis, corneal dystrophies

Setting

We report the case of a child aged of 06 years , followed in dermatology for hereditary ichthyosis linked to the X; who presents ocular symptoms such as photophobia, blepharospasm, foreign body sensation , recurrent painful red eye. Knowing that the child's parents report an increase in signs every winter

Report of case

The general clinical examination of the child reveals an appearance of generalized hyperkeratosis with scaly skin especially on the trunk, upper and lower limbs.

Inspection of the ocular apparatus reveals a

photophobic child, with significant blepharospasm, and watery red eyes. The examination of ocular motility is unremarkable as is corneal sensitivity.

The child's cycloplegic refraction is as follows:

OD: Sphere +2.25. Cylinder + 1.00 at 80°

OG: Sphere + 2.00. Cylinder + 1.50 at 90°

Distant visual acuity with correction: - Right Eye: 04/10. - Left Eye: 03/10.

Examination of the anterior segment with the slit lamp of the eyes reveals a slightly asymmetrical bilateral picture: Wet, stuck eyelashes, telangiectasias and diffuse hyperemia of the free edge with keratinized plugs of the meibomian gland meatuses, Conjunctival hyperemia with a few follicles especially in nasal. The fluorescein examination found a break-up time reduced to 06 seconds; with superficial epithelial lesions concentrated in the interpalpebral area or lower. The rest of the ophthalmological clinical examination is normal .

Ocular damage during X-linked ichthyosis shows a significant prevalence and severity of dry eye, blepharitis and superficial punctate keratitis . The aim of treating eye damage in the replacement of the ocular surface with artificial tears. These disorders do not respond to corticosteroids .

Conclusion/Take home message

X-linked ichthyosis is a rare hereditary skin disease characterized by generalized hyperkeratosis which can involve the eyelids and therefore affecting the ocular surface leading to ocular damage of varying complexity. Prevention is mainly based on genetic counseling .

Abstract #214

Corneal Epithelial Deposits and Oral Gym Supplements Intake: Case Report

AJP. Tovar Gomez*[a]

[a] *UNIDAD NACIONAL DE OFTALMOLOGIA, Guatemala, GUATEMALA*

** Presenting author (dr.alvarojuanpablotovargomez@gmail.com)*

Purpose

To report an unusual case of transient corneal epithelial deposits associated with oral gym supplements intake in an otherwise healthy patient. To highlight the potential and yet unregulated role of gym supplements in corneal epithelial deposits

Setting

Unidad Nacional de Oftalmología, Guatemala City, Central America

Report of case

A 42-year-old male patient was referred by his gym nutritionist after complain of 2 weeks of photophobia and blurry vision. Ocular history was negative for allergy, trauma and surgery. He denied any oral or topical medications use. He reported uneventful soft contact lens wear. There was no family history of ocular disease. His best corrected visual acuity (BCDVA) at distance was 20/200 (Snellen). Slit lamp examination showed bilateral corneal epithelial deposits, intraocular pressure and fundoscopy were normal. No abnormalities observed in corneal topography and specular microscopy. The anterior segment OCT showed epithelial hyperreflective deposits. Patient reported none of his family members had been suspected of or diagnosed with Fabry disease. He underwent a systemic investigation, to rule out Fabry's due to the cornea verticillate-like deposits; including α-galactosidase A levels and genetic testing and all test results were normal. Patient reported heavily oral intake of gym supplements a month before symptoms initiation, that include creatine and mixed amino acids. After three months and discontinuation of the supplements, BCDVA was 20/20 and cornea verticillate-like deposits were absent, no deposits seen on corneal OCT, also photophobia disappeared. Despite medical and nutritional recommendation for cessation, patient restarted his gym supplements and a month later, photophobia and corneal deposits reappeared, with BCDVA 20/400. After total discontinuation of the supplements BCDVA returned to 20/20 and corneal epithelial deposits were absent and remained after one year of follow up.

Conclusion/Take home message

Cornea verticillata may develop as a manifestation of Fabry disease or multiple myeloma or after medication intake of amiodarone, aminoquinolines, antineoplastic agents and non-steroidal anti-inflammatories. There have been no previous reports of cornea verticillate or epithelial deposits associated with over-the-counter gym supplements intake. An interesting point in this case is that the corneal deposits disappeared after discontinuation of the supplements and reappeared within re use, clearly suggesting it's causal relationship. This case highlights the potential, and yet unknown, role of gym supplements in corneal epithelial deposits. Further long-term observation is required to elucidate the mechanism and questions should be asked around regulation for these over-the-counter products

Abstract #215

Effect of 5% albumin eye drops in patients with therapy-refractive ocular surface diseases.

P. Wintersteller*[a], I. Boldin[a], H. Aminfar[a], A. Heidinger[a], N. Medic[a], A. Guttmann[a], J. Horwath-Winter[a]

[a] *MEDICAL UNIVERSITY OF GRAZ, Graz, AUSTRIA*

** Presenting author (paul.wintersteller@medunigraz.at)*

Purpose

Ocular surface conditions such as keratoconjunctivitis sicca (KCS), meibomian gland dysfunction (MGD), and Sjögren syndrome (SS) can require regular and sometimes intensive therapy for the ocular surface. Despite the continuous use of artificial tears, there is often an increase in corneal staining and a rise of subjective complaints in the patient's daily life. We aim to analyze the effect of a regular applied therapy with 5% albumin eye drops on the ocular surface in cases refractory to conventional treatments.

Setting

This study is a single center retrospective data analyses of all therapy-refractory KCS/MGD and, both primary and secondary SS patients that received a treatment with 5% albumin eye drops at the Department of Ophthalmology of the Medical University of Graz from 2012 to 2022.

Methods

All data were collected from the Department of Ophthalmology's patient archive system. Information was gathered before initiating therapy with albumin and at the latest follow-up visit with continuous treatment. 37 KCS/MGD patients with 87 eyes could be included in Group 1 and 33 SS patients with 62 eyes in Group 2. Corneal staining (NEI-score) was analyzed for each eye separately, whereas subjective patient parameters (OSDI, VAS and FACE-score) were evaluated per study participant. Furthermore, the therapeutic management including unpreserved artificial tears, cyclosporine A eye drops and other additional therapy, was also evaluated.

Results

In Group 1, the median observation period was 13 months (range 1-82m), respectively 15 months (range 2-77m) in Group 2. A significant improvement in corneal staining (NEI-score) could be observed in both groups. Group 1 changed from 5.82 ± 4.53 to 3.17±3.67, Group 2 from 8.63±3.62 to 6.48±3.60. The VAS also showed a statistically significant reduction; 67.84±18.67 to 55.28±21.48 in Group 1 and 59.51±20.23 to 53.24±22.19 in Group 2, other subjective parameters did not exhibit significant changes. 12 patients (8 in Group 1 and 4 in Group 2) needed an expansion of the topical therapy during the observation period.

Conclusions

Referring to our study results, therapy with 5% albumin eye drops represents a satisfactory approach in patients with therapy-refractory KCS/MGD or SS. Both groups showed a significant reduction in corneal staining. However, aside from changes in the reported VAS, the subjective patient parameters remained largely stable. It should be stated that concerning the baseline objective and subjective parameters of our study cohort, both groups exhibited rather severe and exclusively therapy-refractory cases. Therefore, moderate to severe cases of KCS/MGD and SS could potentially exhibit increased benefits from regular therapy with 5% albumin eye drops.

Financial Disclosure of all authors

No financial disclosures

Abstract #216

Corneal and refractive changes associated with Bemarituzumab.

YL. Wong*[a], J. Kim[a]

[a] *MANCHESTER ROYAL EYE HOSPITAL, Manchester, UNITED KINGDOM*

** Presenting author (yeelingwong@nhs.net)*

Purpose

To describe and demonstrate the corneal epithelial alterations resulting from Bemarituzumab infusion, their development, and how they are managed.

Setting

Manchester Royal Eye Hospital, United Kingdom

Report of case

Introduction

Bemarituzumab, the first-in-class, afucosylated, humanized IgG1 anti-fibroblast growth factor receptor 2 isoform IIb (FGFR2b) monoclonal antibody, is an investigational study drug used as an adjunct in patients with FGFR2b-selected gastric or gastro-esophageal junction adenocarcinoma. Although the ongoing trial is showing promising clinical efficacy, little is known in the literature about its impact on the cornea and ocular surface.

Case

A 66-year-old woman participates in regular eye screenings as part of the FORTITUDE-101 trial investigating the safety and efficacy of Bemarituzumab as an adjunct to her standard chemotherapy for advanced stomach cancer with overexpression. Three months after receiving Bemarituzumab infusion, the patient was observed to have punctate epithelial staining and a change in refractive error. She reports vision distortion and occasional discomfort, particularly in the evenings. Six months post-treatment, she exhibited an undulated corneal epithelial surface with linear keratopathy and punctate epithelial erosions. Her refractive error continues to fluctuate, with up to a 4.00 dioptre shift within a month. Anterior segment Optical Coherence Tomography (AS-OCT) reveals localized areas of hyperreflective material on the corneal epithelium and a thin band of hyperreflectivity along Bowman's layer. Treatment was discontinued due to corneal events. The patient was also initiated on copious lubricating eye drops and a tapering course of topical corticosteroids, which helped alleviate her symptoms and stabilize the variability of refractive error. Clinical improvement of corneal epithelial changes was observed both clinically and on AS-OCT after cessation of treatment.

Conclusion/Take home message

The administration of Bemarituzumab leads to visual disruptions, manifested as vision distortion and varying refractive errors, attributed to its effect on the ocular surface, particularly through corneal epithelial deposits. Nevertheless, discontinuation of the medication helps stabilize and improve corneal surface irregularities, thereby alleviating visual symptoms, discomfort, and the fluctuating refractive error.

Pterygium & limbal stem cell failure

Abstract #217

Severity Classification of Limbal Stem Cell Failure Due to Steven Johnson Syndrome in the Light of the Classification Consensus of Limbal Stem Cell Deficiency

Z. Akgun*[a], M. Palamar[b], S. Egrilmez[b], A. Yagci[b], O. Barut Selver[b]

[a] *Van Research and Training Hospital, Van, TURKEY ;* [b] *Ege University, Faculty of Medicine, Department of Ophthalmology, Izmir, Turkey, Izmir, TURKEY*

** Presenting author (zeyakgunn93@gmail.com)*

Purpose

To examine and understand the Limbal Stem Cell Deficiency (LSCD) due to Steven-Johnson Syndrome (SJS) in line with the new classification system for the first time in the literature.

Setting

This study was conducted at Ege University Faculty of Medicine Department of Ophthalmology, and Van Research and Training Hospital Department of Ophthalmology, Turkey. Twenty-four eyes of 14 patients were included.

Methods

Medical records of patients with LSCD due to SJS were retrospectively reviewed. In addition to demographic data such as age and gender, detailed ophthalmological findings such as ocular symptoms, best corrected visual acuity (BCVA), presence of systemic diseases, drug usage, previous surgery history, follow-up period, and surgical intervention were recorded. Anterior segment photographs of the patients, taken approximately 6 months after the acute period, were retrospectively analyzed by two independent masked observers. LSCD severity was graded according to the classification published by the Limbal Stem Cell Working Group.

Results

The mean age was 36.09±16.7 (9-58), the female/male ratio was 11/3. LSCD was graded according to the classification published by the Working Group in 2019. Corneal opacity was divided into three stages according to severity. Limbal involvement was classified as A if it was below 50%, B if it was between 50-100%, and C if it was 100%. The results were found as follows: 6 eyes (25.0%) Stage IA, 4 eyes (16.6%) Stage IB, 1 eye (4.2%) Stage IC, 1 eye (4.2%) Stage IIA, 3 eyes (12.5%) Stage IIB, and 9 eyes (37.50%) Stage III

Conclusions

The present study is the first in the literature to describe the disease weight distribution in SJS patients with LSCD. Moreover, to our knowledge, this is also the first study in the literature to define the LSCD classification due to SJS according to this new global consensus. According to the results of the present study, LSCD follows a bimodal distribution. A very severe (Stage III-32.14%) or very mild (Stage IA-21.42%) LSCD was encountered in the majority of patients.

Financial Disclosure of all authors

The authors have no relevant financial or nonfinancial interests to disclose.

Abstract #218

Where Do We Stand in Subconjunctival Anti-VEGF Treatment in Limbal Stem Cell Deficiency?

D. Bagci*[a], M. Gurdal[b], O. Barut Selver[a]

[a] *Ege University, Department of Ophthalmology, Izmir, TURKEY ;* [b] *Ege University, Department of Medical Biochemistry, Izmir, TURKEY*

** Presenting author (dnizbagci@gmail.com)*

Purpose

To evaluate the safety and effectiveness of subconjunctival bevacizumab in the treatment of corneal neovascularization in patients with limbal stem cell deficiency (LSCD) managed with various treatment approaches including cultivated limbal cell transplantation.

Setting

A total of 14 LSCD patients treated with various approaches whose corneal vascularization was managed with subconjunctival bevacizumab in a tertiary eye center between 2023-2024 were included into the study.

Methods

Medical data of patients (17 eyes) who received subconjunctival bevacizumab (0.1 mL 2.5 mg/0.1 mL) for corneal neovascularization was analyzed retrospectively. Accompanying corneal neovascularization were scored clinically as recommended by Dua et al in 2018.

Results

The mean age of the patients was 42±5 (20-67) years with a M/F ratio of 5/2. 11 of 14 LSCD patients received surgical treatment (5 cultivated limbal cell transplantation, 6 limbal tissue transplantation) and 3 received medical treatment only. The average subconjunctival bevacizumab treatment administered to patients was 1,52±0,62 (1-3). Corneal neovascularization was completely regressed in 2 (11.76%) eyes, partial regressed in 14 (82.3%) eyes, was not changed in 1 eye (5.8%). Corneal neovascularization scores before and after the injection were 12,17±5,19 (3-22) and 8,4 ±4,36 (3-17) respectively.

Conclusions

Subconjunctival bevacizumab application has long been known to be effective in regressing corneal neovascularization. Subconjunctival bevacizumab application that is performed at the right time can serve as a vector to ensure that the main treatment achieves better clinical results in the long term, especially in cases of cornel neovascularization, which affects the failure of treatments in LSCD.

Financial Disclosure of all authors

The authors have no relevant financial or nonfinancial interest to disclose. Author Deniz Bagci decleras that she has no conflict of interest. Author Mehmet Gürdal decleras that he has no conflict of interest. Author Ozlem Barut Selver decleras that she has no conflict of interest.

Abstract #219

Ocular surface squamous neoplasia (OSSN) masquerading as psuedoepitheliomatous hyperplasia (PEH) in chronic Vernalkeratoconjunctivitis (VKC)

AG. Dastidar*[a]

[a] *SYNERGY EYE CARE, New Delhi, INDIA*

** Presenting author (dr.aditighosh@gmail.com)*

Purpose

To describe succesful identification and management of ocular surface squamous neoplasia in from masquerades with strong clinical suspicion , detailed cytological and histopathological examination

Setting

Retrospective review of case record of 24 year old male patient with histopathology proven ocular surface squamous neoplasiaat a tertiary care centre in India

Methods

A 24 year old man was referred with history of bilateral vernal keratoconjunctivitis.On examination,visual acuity was 6/9 in right eye and 6/6 in left eye.Right eye showed a gelatinous lesion 7-2' O clock hour limbal with corneal encroachment with feeder vessels .Rose Bengal stain positive. Rest ophthalmic examination was unremarkable in both eyes.Right eye impression cytology showed pleomorphic plump epithelial cells suggestive of OSSN. Preoperative chemotherapy followed by intoto excision biopsy with alcohol assisted removal of corneal lesion with no touch technique with cryotherapy and amniotic membrane graft.Histopathology confirmed of OSSN. At 6 months follow up no recurrence noted.

Results

Right eye limbal lesion mimicking OSSN was suspected and impression cytology was done which showed multiple pleomorphic plump epithelial cells . Two cycles of topical chemotherapy was given followed by in toto excision biopsy of lesion with wide margin (4 mm) along with alcohol assisted removal of corneal lesion with no touch technique,dry surgical field with cryotherapy of margins and amniotic membrane transplantation was done.Histopathology revealed multilayered thickening of the conjunctival epithelium with loss of polarity,nuclear atypiawith no break in the basement membrane suggestive of OSSN. Nno recurence of lesion noted at 6 months.

Conclusions

We report a rare presentation of OSSN masquerading as PEH in chronic VKC. Awareness of similarity between the two is important for ophthalmologists in view of difference in approach and treatment.Psuedoepitheliomatous hyperplasia in chronic Vernalkeratoconjunctivitis can mimic as OSSN , but the key is to not miss out on neoplastic lesion. Excellent results can be achieved by early detection, investigations, followed by meticulous surgery and regular follow up of the patient. This case highlights the importance of strong clinical suspicion in masquerading condition added with detailed cytological and histopathological examination for early diagnosis and management of OSSN.

Financial Disclosure of all authors

Nil

Abstract #220

Ocular Surface Reconstruction for Ophthalmic Complications in Pediatric Recessive Dystrophic Epidermolysis Bullosa

S. Den*[a], Y. Abukawa[b], N. Kishimoto[a], A. Baba[a], Y. Higashi[a], K. Kasai[a], T. Nakano[a]

[a] *Department of Ophthalmology, THE JIKEI UNIVERSITY SCHOOL OF MEDICINE, Tokyo, JAPAN ;* [b] *Department of Anesthesiology, THE JIKEI UNIVERSITY SCHOOL OF MEDICINE, Tokyo, JAPAN*

** Presenting author (denseika@gmail.com)*

Purpose

Recessive Dystrophic Epidermolysis Bullosa (RDEB) is a disease that causes abnormality of the basement membrane zone of skin and mucous membranes due to mutation of collagen Ⅶ, which encodes anchoring fibril protein. The involvement of the eye with conjunctiva and cornea such as superficial punctate keratitis, symblepharon, pseudopterygium and corneal scarring, which occur commonly since childhood, may interfere with the development of visual function. The purpose of this study is to report the successful surgical outcome and post-operative management of three eyes of two cases of pediatric RDEB subjected to ocular surface reconstruction (OSR) using amniotic membrane transplantation (AMT).

Setting

Retrospective case study at single institute

Report of case

Case 1: An 8-year-old boy was diagnosed with RDEB at birth. He developed temporal symblepharon and corneal opacity in his right eye and only mild temporal symblepharon in his left eye at around 2 years of age. Best corrected visual acuity (BCVA) was 20/300 in the right eye and 20/30 in the left eye at initial visit to us at age 4. Punctal plugs were inserted for lubrication in both eyes, resulting in the left BCVA improvement to 20/20. At age 5, he underwent superficial keratectomy, symblepharon lysis, and fornix reconstruction using AMT in the right eye under general anesthesia. BCVA improved to 20/40 postoperatively. Both eye drops, fluorometholone and tranilast, were continued postoperatively and were also used in his left eye to prevent the progression of symblepharon. Herpetic dendritic keratitis developed in both eyes at age 7, which resolved within 1 week with Aciclovir ointment. Because temporal pseudopterygium and corneal opacity progressed and BCVA dropped to hand motion, similar surgery was performed on his left eye at age 8. Eight months after surgery, there was no recurrence and his left BCVA improved to 20/40. The temporal symblepharon of his right eye tended to recur slightly 3 years after surgery, but the corneal clarity is maintained to date.

Case 2: A 7-year-old boy was diagnosed with RDEB at birth. At age 4, he developed corneal opacity and temporal symblepharon in both eyes, which was more severe in his right eye. BCVA of initial visit to us at age 6 was 20/300 in the right eye and 20/200 in the left eye. Similarly, at age 6, he underwent OSR in his right eye under general anesthesia. His BCVA improved to 20/25, and that is maintained 16 months after surgery. No recurrence of symblepharon nor corneal opacity has been observed.

Conclusion/Take home message

We experienced 3 eyes of 2 children with RDEB who were able to undergo OSR without systemic and ocular complications. AMT is effective in preventing recurrence of symblepharon, pseudopterygium and corneal cicatrization. To avoid amblyopia, surgical treatment of ocular surface conditions associated with RDEB should be considered; however, it is rarely performed because of the difficulty of general anesthesia due to the damage of oral mucosa and respiratory mucosa. The clinical course after surgery in our 2 cases shows significant improvement in visual acuity, which may suggest that surgical intervention is beneficial for the development of visual function. However, long-term careful follow-up is required.

Abstract #221

Limbal Stem Cell Deficiency Following Surgery for Ocular Surface Squamous Neoplasia

A. Devebacak*[a], B. Yaman[b], M. Palamar[c]

[a] *Dr. Behcet Uz Training and Research Hospital, Department of Ophthalmology, Izmir, TURKEY ;* [b] *Ege University, Department of Pathology, Izmir, TURKEY ;* [c] *Ege University, Department of Ophthalmology, Izmir, TURKEY*

** Presenting author (dralidevebacak@gmail.com)*

Purpose

Investigation of limbal stem cell deficiency (LSCD) after surgical treatment of ocular surface squamous neoplasia (OSSN).

Setting

The retrospective case-control study in a referral center.

Methods

This retrospective case-control study evaluated clinical and histological data from OSSN patients who underwent surgery at a referral center. The following data were assessed: age and gender, involved eye, the extent of limbal involvement (< 3 clock hours, 3 - 6 clock hours, 6 - 9 clock hours, > 9 clock hours), affected limbal side (superior, inferior, nasal, temporal), corneal involvement, the stage of the tumor, histopathological diagnosis and grade, recurrence rate, LSCD development, and LSCD severity.

Results

The investigation involved 98 subjects(58 males, 40 females), with an average age of 61.1(23-86) years.OSSN showed involvement in less than 3 clock-hours in 48(49.0%), 3-6 clock-hours in 32(32.7%), 6-9 clock-hours in 12(12.2%), and more than 9 clock-hours in 6(6.1%) eyes.LSCD was observed in 36(36.7%) patients afterwards surgery.Prevalence of LSCD was higher in eyes with more than 6 clock-hours of OSSN, corneal involvement and recurrent OSSN*($p<0.001$, $p=0.021$, $p=0.003$ respectively)*.Affected limbal side did not impact LSCD prevalence*($p=0.869$)*.Prevalance of LSCD increased with higher tumor stage and histopathological grade*($p<0.001$, $p=0.019$ respectively)*.In multivariate analyses, the extent of affected clock-hours was the only independent risk factor*($p<0.001$).*

Conclusions

LSCD is more likely to occur in OSSN with more than 6 hours of involvement and in OSSN with corneal involvement. Therefore, the addition of limbal autograft transplantation to the surgical procedure may be preferable in these cases.

Financial Disclosure of all authors

Conflict of interest: The authors declare no conflict of interest in this paper.
This research did not receive any specific grant from any funding agency in the public, commercial, or not-for-profit sector.

Abstract #222

Mid-Term Clinical Outcomes in Multicenter Allogeneic/Autologous Limbal Explant Culture Therapy Product Application

M. Gurdal*[a], N. Gunaydin Tutas[b], Y. Yildirim[c], O. Evren Kemer[d], D. Dursun Altinors[e], O. Barut Selver[f]

[a] Limbustem R&D Medical Products Ltd & Ocular Surface Research Laboratory, Ege University, Bornova, Izmir, TURKEY ; [b] Department of Ophthalmology, Kartal Dr. Lutfi Kirdar City Hospital, Kartal, Istanbul, TURKEY & Department of Ophthalmology, Memorial Bahcelievler Hospital, Bahcelievler, Istanbul, TURKEY ; [c] Department of Ophthalmology, Basaksehir Cam Sakura City Hospital, Basaksehir, Istanbul, TURKEY ; [d] Department of Ophthalmology, Ankara Bilkent City Hospital, Cankaya, Ankara, TURKEY ; [e] Department of Ophthalmology, Faculty of Medicine, Baskent University, Cankaya, Ankara, TURKEY ; [f] Limbustem R&D Medical Products Ltd & Ocular Surface Research Laboratory, Ege University & Department of Ophthalmology, Faculty of Medicine, Ege University, Bornova, Izmir, TURKEY

** Presenting author (mehmet.gurdal88@gmail.com)*

Purpose

To present the mid-term clinical outcomes in multicenter allogeneic/autologous limbal explant culture therapy product application for the treatment limbal stem cell deficiency (LSCD).

Setting

The commercial ex *vivo* cultured limbal epithelial cellular therapy products were produced by Limbustem at Stembio Cord Blood, Cell and Tissue Center and transplanted to 9 patients with LSCD between 2023-2024.

Methods

Commercial therapy product was produced from limbal biopsy taken from healthy eyes either autologous or allogeneic using the *ex vivo* explant culture technique on human amniotic membrane (hAM) under Good Manufacturing Practices conditions. The LSCD score of the patients was calculated according to the global consensus published in 2019. After bleeding control was achieved following pannus dissection, the product was transferred to the diseased ocular surface. Routine ophthalmological examination findings and LSCD score were evaluated during follow-up. All patients were treated with topical steroids, antibiotics, and cyclosporine, while systemic immunosuppression was applied in addition to allogeneic cases.

Results

The mean age was 41 and the female/male ratio was 2/9. The most common etiology was alkaline chemical burn. Unilaterality/bilaterality and allogeneic/autologous transplantation rates were 1/2 and 4/5, respectively. The LSCD score before treatment was Stage 3 in all patients. Seven patients completed at least 3 months of follow-up with fully reconstructed ocular surface. Preoperatively, the mean vision was below 2.10logMAR except for 1 patient. The mean vision of patients who completed the six-month follow-up was 0.27(0.15-0.52)logMAR. Intense subconjunctival bleeding (1), partial separation of hAM (1) and a rejection reaction (1) were observed as complication.

Conclusions

These clinical results show that the ex *vivo* cultured limbal epithelial cellular therapy product can be used effectively and successfully in selected unilateral/bilateral LSCD cases, especially through timely and correct management of complications that may arise.

Financial Disclosure of all authors

The two authors of the presentation (Dr Gurdal and Assoc Prof. Barut Selver) are the co-founders of the spinout company named with “LimbuStem” and the company has research support from TUBITAK-TEYDEB. The rest of the authors have no financial disclosure or conflicts of interest with the discussed material in this presentation.

Abstract #223

The Role of Amniotic Membrane Transplant in the treatment of Severe Alkali Chemical Injury

E. Hegazy*[a], W. Power[b]

[a] *Royal Victoria Eye and Ear Hospital, Dublin 8, IRELAND ;* [b] *Royal Victoria Eye and Ear Hospital, Dublin, IRELAND*

** Presenting author (esraajet70@gmail.com)*

Purpose

To describe the application and outcome of utilising Amniotic Membrane Transplant in the management of severe alkali chemical injury in the acute setting

Setting

Royal Victoria Eye and Ear Hospital (RVEEH)

Report of case

A Forty eight year old gentleman presented to the RVEEH with severe ocular injury after a pressurised container filled with lyme exploded into both eyes. Initial examination revealed a right and left visual acuity of 6/20 ph 6/7.5. Anterior segment exam of both eyes revealed 270 degrees of limbal ischaemia involving the temporal, superior and nasal limbus. There was superior conjunctival necrosis of the right eye and bilateral upper lid ischaemia of the tarsal conjunctiva. There was mild corneal opacification of both eyes with Descemets folds. Iris details were visible and there was anterior chamber flare. Intraocular pressure was 40mmHg in both eyes. Fundus examination was normal in both eyes.

He was given intravenous Acetazolamide for his intraocular pressures and topical steroids, antibiotics, ascorbic acid and lubricants as well as oral Doxycycline, Vitamin C as per management for chemical injury.

He underwent bilateral amniotic membrane transplants (AMT) the following day. The AMT was placed over the cornea and bulbar conjunctiva, it was then guided into the upper and lower fornices covering the upper and lower tarsal conjunctiva and reflected over the lid margins. Full thickness sutures through the lids were used to hold the AMT in place using bolsters. A symblepharon ring was fashioned and inserted into the upper and lower fornix.

The AMT dissolved over the next 10 days and the symblepharon ring and bolsters were removed. There was moderate persistent epithelial defects of both corneas and it was decided to insert Amnioclips to cover these. These dissolved over 5 days.

Currently there is full resolution of epithelial defects on both ocular surfaces. He continues to have persistent corneal opacification, epithelial irregularity and Descemts folds as well as significant scarring of his tarsal conjunctiva with deep fornices and no symblepharon.

Conclusion/Take home message

AMT is a useful tool in the management of devastating ocular injuries involving significant de-epithelisation and limbal stem cell failure. It has multiple properties including anti-inflammatory, anti-fibroblastic, anti-angiogenic and barrier protection, to ensure better outcomes for patients who sustain these sight altering injuries. Our case demonstrates its efficacy in a patient who otherwise may have experienced debilitating ocular surface scarring and symblepharon formation.

Abstract #224

Objective assessment of long-term restoration of the corneal epithelium following autologous simple limbal epithelial transplantation

S. Shanbhag*[a], S. Basu[a]

[a] *LV PRASAD EYE INSTITUTE, HYDERABAD, Hyderabad, INDIA*

** Presenting author (swapnashanbhag@lvpei.org)*

Purpose

This study aimed to objectively assess the long-term corneal epithelial recovery after autologous simple limbal epithelial transplantation (SLET) for ocular chemical burn (OCB) induced unilateral limbal stem cell deficiency (LSCD)

Setting

This is a cross-sectional imaging and diagnostic study performed in a single tertiary care institute.

Methods

Both eyes of all patients were assessed at a single follow-up visit between 4-10 year post procedure with slit-lamp biomicroscopy (SLBM), anterior segment optical coherence tomography (ASOCT), in-vivo confocal microscopy (IVCM), and impression cytology (IC). Objective parameters such as the corneal epithelial phenotype, epithelial thickness, and epithelial clarity were studied. The parameters in the donor eye served as a control. The primary outcome measure was restoration of a completely epithelized corneal surface with SLBM, AS-OCT, IVCM, and IC.

Results

This study analyzed imaging and diagnostic data from 94 eyes of 47 patients with a median follow-up of 5.75 years (IQR: 4.8 - 6.6) post SLET. The median age at the time of surgery was 16 years [(IQR): 8-26]. The most common etiology for OCB was alkali in 34 (72%) eyes. Normal corneal epithelial phenotype, as assessed by SLBM, IVCM, and IC was observed in 74.5% of the recipient eyes (35/47). This group also showed normalisation of corneal epithelial thickness measured by AS-OCT and normal epithelial clarity was seen on SLBM and ASOCT as compared to healthy donor eyes.

Conclusions

The findings of this study show that after autologous SLET for ocular burn-induced unilateral LSCD, there is a long-term and sustained recovert in terms of corneal epithelial phenotype, thickness, and clarity.

Financial Disclosure of all authors

No financial disclosures

Abstract #225

Risk Factors for Development of Limbal Stem Cell Deficiency After Acute Ocular Burns

S. Shanbhag*[a], A. Kate[b], S. Basu[a]

[a] *LV PRASAD EYE INSTITUTE, HYDERABAD, Hyderabad, INDIA ;* [b] *LV PRASAD EYE INSTITUTE, Vijaywada, INDIA*

** Presenting author (swapnashanbhag@lvpei.org)*

Purpose

To identify the risk factors predictive of limbal stem cell deficiency (LSCD) in eyes with acute ocular burns (AOB).

Setting

This is a retrospective comparative case series performed at a single tertiary care institute.

Methods

This study included 112 eyes of 96 patients with AOB of severity >Dua grade II who had follow-up until complete epithelization. Data on injury details, clinical features, and treatment were collected. These parameters were subjected to a bivariate analysis between the patients who developed LSCD and those that did not. Multiple logistic regression analysis was performed to calculate the odds ratios (OR) for risk factors of LSCD. The main outcome measures were identification of risk factors for LSCD following AOB and for LSCD requiring surgical intervention.

Results

Of the 112 eyes, 61 eyes (54%) developed LSCD. A greater number of LSCD eyes required a surgical intervention in the acute phase (p=0.00006). None of the patients in the non-LSCD group required a chronic phase surgical intervention as compared to the 57% LSCD eyes. Regression analysis revealed lime injury (OR: 12.1,p=0.001), conjunctival epithelial defect of >50% surface area (OR=12.4,p=0.0001), and primary amniotic membrane transplantation (AMT,OR:5.1,p=0.007) to be risk factors for the LSCD development. Conjunctival involvement of >50% was a significant risk factor for LSCD necessitating surgical intervention (OR: 4.1; p=0.02).

Conclusions

Patients with lime injury and larger conjunctival epithelial defects are at a higher risk of development of LSCD post AOB. Larger conjunctival defects also indicate development of more severe LSCD. Eyes with LSCD have poorer visual outcomes. Thus, preventing this entity by addressing the risk factors can alleviate the socioeconomic burden both on the affected individuals and the healthcare system.

Financial Disclosure of all authors

No financial disclosure for any author.

Abstract #226

Demonstration of Long-Term Revascularization of Limbal Ischemia Developing in Chemical Burns with AS-OCTA

K. Sincar*[a], O. Furundaoturan[b], M. Palamar Onay[a], O. Barut Selver[a]

[a] *EGE UNIVERSITY OPHTHALMOLOGY DEPARTMENT, Izmir, TURKEY ;* [b] *kars harakani hospital, Kars, TURKEY*

** Presenting author (kubsincar96@gmail.com)*

Purpose

The period during which the ocular surface stabilizes after chemical burns is defined as approximately 1 year. The aim of this study is to determine the status of the limbal vascular structure at 1 year in 10 patients whose limbal ischemia was identified by anterior segment optical coherence tomography angiography (AS-OCTA).

Setting

Patients with limbal ischemia due to ocular chemical injury were evaluated both clinically and with AS-OCTA between January 2021 and January 2022, and then the same evaluation was performed at the 1-year follow-up were included.

Methods

Medical records containing anterior segment photographs and AS-OCTA images of 10 patients (10 eyes) were evaluated, retrospectively. One-year follow-up limbal stem cell deficiency (LSCD) severity was staged according to the global consensus published in 2019.

Results

The female/male ratio was ¼. The mean age was 36.6±10.57 (21-52). Limbal ischemia detected by AS-OCTA at the time of ocular burn and at 1-year follow-up were 7±2.58 (3-12) and 1.6±3.86 (0-12) clock hours ($p<0.05$). Limbal ischemia detected by biomicroscopy at the time of ocular burn and at 1-year follow-up was 5.5±2.5 (2-10) and 1.4± 3.77 (0-12) clock hours, respectively ($p<0.05$). It was observed that 2 patients developed LSCD (1 in Stage 1a, 1 in Stage 3c).

Conclusions

The use of AS-OCTA is significant in visualizing limbal vascularity and suggests that it plays an important role in more objective and sensitive assessment of limbal ischemia in cases of ocular surface chemical injury. The limbal ischemia area often becomes revascularized during monitoring, and this situation can be demonstrated objectively by AS-OCTA.

Financial Disclosure of all authors

The authors have no revelant financial or nonfinancial interests to disclose . Author Kubra Sincar declares that she has no confilct of interest. Author Onur Furundaoturan declares that he has no confilct of interest. Author Melis Palamar Onay declares that she has no confilct of interest. Author Ozlem Barut Selver declares that she has no confilct of interest.

Index of authors