Conclusions This novel synthetic cornea device may offer enhanced tissue integration and reduced inflammation owing to its flexibility and biocompatibility leading to improved retention. Early feasibility human studies are underway.

15 HOW TO RESCUE A PANCORNEAL MELTING CAUSED BY A PYOCYANIC ENDOPHTHALMITIS AFTER A CATARACT SURGERY?

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Purpose A 70-year-old man underwent a 1.8mm clear corneal temporal incision cataract surgery with toric lens. His background was bilateral high-myopia and non-controlled advanced chronic open-angle glaucoma (topical quadritherapy). He was referred in emergency for pain and redness of his left eye (LE) 11 days (D) after cataract surgery: LE was complicated by a pseudomonas aeruginosa endophthalmitis. Vision was limited to light perception. Intraocular pressure (IOP) was 40 mmHg. Despite appropriate care, no local improvement occurred: there was a progressive purulent pancorneal melting. Considering the bilateral sight threatening, the patient agreed to attempt a rescue corneoscleral transplantation rather than primary evisceration at D14.

Methods (Fig. step1) A 14mm Flieringa ring stabilized the globe. We made a fastidious 360° limbal peritomy, a wide recipient's trephination (9.5 mm), a corneoplasty as close as possible to the trabeculum, and an anterior segment's repair. The prepared 13mm therapeutic corneoscleral graft (baseline ECD 1580cell/mm^2) was sutured with separate stitches, then a conjunctival reconstruction, a new AMG and IVT series of antibiotics. No adverse event occurred.

Results Residual astigmatism was 1.3diopters and vision improved without primary graft failure (ECD 1000cell/mm^2 at M6): 20/400 far and 20/160 near at 2 weeks, 20/200 far and 20/80 near at 6 months. IOP was 14 mmHg under topical preservative-free double therapy with stable visual field. Fluorometholone 0.1% and ciclosporin 2% drops were pursued.

At M15, a complicated abscess was identified, caused by multiple germs (Candida parapsilosis + Propionibacterium acnes + Staphylococcus epidermidis). Healing was obtained after 3 months of sequential treatments.

At M18, initial corneoscleral graft was globally opacified (vision: hands motion) with recurrent epithelial ulcers, and 200° deep stromal neovessels. We attempted a new graft on this unique terrain in order to decrease the infectious risk, and increase the comfort and vision if possible: custom DMEK (HLA A B DR matched) + AMG + limbal allograft (Fig. Step 2).

Conclusions 30 months after the initial corneoscleral transplantation, 12 months after this first in human custom DMEK, structural and functional rescue (20/200) has been extended. The patient had normal IOP, no pain and normal macular profile, with a relatively minimal postoperative treatment (only fluorometholone 0.1%, ciclosporin 2%, autologous serum drops).

16 INFLUENCE OF UMBILICAL CORD BLOOD PLATELET LYSATE ON BIOLOGICAL CHARACTERISTICS OF HUMAN CORNEAL ENDOTHELIUM DURING ORGAN CULTURE

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Purpose The purpose of this study was to create organ culture medium for preservation human corneas without components of animal origin. We evaluated the efficiency in maintaining the quality of corneas during organ culture in medium supplemented with umbilical cord blood platelet lysate (UCB-PL).

Methods Human corneas were stored in standard organ culture medium (Eagle's Minimum Essential Medium buffered with 25 mM HEPES, 2 mM L-glutamine, penicilin, streptomycin and amphotericin B) supplemented with 2% UCB-PL and in the standard medium supplemented with 2% FBS during 28 days at 31 °C. Fourteen corneas (7 pairs) with endothelial cell density (ECD) $\geq$ 2000 cells/mm^2 were enrolled. The quality of the corneal endotelium was assessed by ECD, viability (trypan blue), and morphology of endothelial cells (EC) by light microscopy at 0.,7.,14., 21. and 28. day of organ culture. Following organ culture, immunostaining of flat-mounted corneas was preformed by analysis of expression and distribution of Zonula occludens-1 (ZO-1), (Na+/K+)-ATPases, Ki-67 and caspase 3. Metabolical changes during organ culture were observed by glucose and lactate concentration. Differences in numerical variables between two measurement points were tested with the Wilcoxon test.

Results In terms of preservation of EC, both medium produced similar results. ECD decreased in both media, morphology changes and viabiliy of EC remained comparable between two groups with no significant differences between observed parameters during 28 days. After 28 days of organ culture, ZO-1 was expressed and distributed following a zig-zag line in EC, while (Na+/K+)-ATPases was expressed on the lateral surface of epithelial membranes and EC on corneas stored in both media. Ki67 was detected in the epithelial layer, and was not detected in the endothelium. The expression of caspase 3, was shown by some corneal epithelial cells but it was not detected in EC. Metabolic changes during organ culture showed, decrease in glucose and increase in lactate concentration in both tested media.

Conclusion The present study showed comparable effect of FBS and UCB-PL on biological characteristics on EC during organ culture. The quality of human corneas stored for 28 days at 31 °C in a medium with UCB-PL was preserved. This qualifies UCB-PL as a safe, effective and readily available substitute for FBS and the possibility of its use in serum-free medium in corneal preservation and eye banking field.