35 REVIEW ON ENDOTHELIAL CELL LOSS OF CORNEAL TRANSPLANTS AND POSSIBLE CORRELATIONS

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The Tissue Bank of the Upper Austrian Red Cross in Linz, Austria, is a multi-tissue bank, processing corneal transplants (for PKP, for DMEK, pre-cut DMEK), homografts (aortic valve, pulmonary valve, pulmonal patch), amnion grafts (frozen or cryopreserved), autologous tissues and cells (ovarian tissue, cranial bone, PBSC) as well as investigational medicinal products and ATMPs (Aposec, APN401).

This presentation sums up retrospective data of the endothelial cell count of corneae at the time of first evaluation and at the time of reevaluation before transplantation as well as the cell count of pre-cut DMEK before transplantation.

Regarding corneal grafts it is advisable to review the data of the previous years to find potential factors influencing the cell count of corneal tissue. Certain factors as donor age or duration of time between death of the donor until the cornea is cultivated might have an impact on endothelial cell loss.

719 corneal transplants were included in this data comparison (PKPs, Corneae for DMEK and pre-cut DMEK), which were evaluated between January 2017 and March 2021. The average donor age was 66 years (22 to 88yrs). The average time until enucleation was 18 hours after death (3 to 44h). The mean duration of cultivating the cornea until reevaluation before transplantation was 15 days (7 to 29d).

The average cell count at time of first evaluation was 2723 c/mm² (1550 to 3950c/mm²), at the time of reevaluation before transplantation 2613c/mm² (1650 to 3325c/mm²) and of the pre-cut DMEK transplants 2550c/mm² (2000 to 3233c/mm²).

The results show an average cell loss of 6% from time of first evaluation compared to the time of reevaluation before transplantation and an average cell loss of 9% for pre-cut DMEK in comparison to the cell count at first evaluation. Dividing the donors in age groups of 10 years shows no noticeable difference in the results as the cell count at first evaluation compared to reevaluation shows cell loss between 4,9% and 8,8% with no tendency of increasing cell loss regarding donor age. The same seems to be the case regarding duration of cultivation until reevaluation.

The aim of the data review was to determine the cell loss of corneal transplants and attempt to identify possible factors having an impact on endothelial cell loss of cultivated corneae. In conclusion the data comparison shows that donor age and time of cultivation seem to have no impact on cell loss.

36 CORNEA MICROBIOLOGY CONTAMINATION RATE DEPENDING ON POST MORTEM TIME, RETROSPECTIVE ANALYSIS AT CROATIAN TISSUE AND CELL BANK, UHC ZAGREB

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Background Corneas procured post mortem are at risk of microbiology contamination, therefore decontamination procedures before storage, aseptic techniques during processing and antimicrobials used in the storage medium are routinely used. Despite that, corneas are discarded due to microbiology contamination. According to professional guidelines, corneas can be procured preferably within 24 hours after cardiac arrest but up to 48 hours. Our goal was to evaluate the risk of contamination depending on the post mortem time and the spectrum of microbes isolated.

Methods Corneas were decontaminated before procurement using 0,5% povidone iodine and tobramycin, stored in the organ culture medium and microbiologically tested after four to seven days of storage. Ten millilitres of cornea preservation medium were inoculated in two blood bottles (aerobic, anaerobic/fungi, Biomeriex) and incubated for seven days.

Microbiology testing results in the period of four years (2016-2020) were retrospectively analysed. Corneas were divided in four groups depending on the duration of post mortem interval: group A post mortem interval < 8 h, group B post mortem ranging from 8 to 16 h, group C post mortem ranging from 16 to 24 h and group D post mortem > 24 h. Contamination rate and spectrum of isolated microorganisms in all four groups were analysed.

Results 1426 of 2019 procured corneas were stored in organ culture and microbiologically tested. 65/1426 of tested corneas were contaminated (4,6%). In total, 28 strains of bacteria and fungi were isolated.

Contamination rate of post mortem groups are as following: group A 3,1% (14/455), group B 4,1% (23/561), group C 6,7% (27/402) and group D 12,5% (1/8).

In the group A bacteria family Staphylococcaceae, Moraxellaceae, Morganellaceae were predominately isolated (64,3%). In the group B fungi Saccharomycetaceae, bacteria Moraxellacea, Staphylococcaceae, Morganellaceae and Enterococcaceae were predominately isolated (78,1%). In the group C, bacteria family Enterococcaceae, Moraxellaceae and fungi Saccharomycetaceae are most often isolated (70,3%). In the group D bacteria family Enterobacteriaceae was isolated (100%).

Conclusion Organ culture allows detection and discard of microbiology contaminated corneas. Our results show higher microbiology contamination rate for corneas with longer post mortem intervals, suggesting these contaminations can be rather related to donor post mortem changes and contamination than previous infection. In order to keep the best quality and safety of the donor cornea, all efforts should be directed in disinfection of the cornea and keeping post mortem interval shorter.

37 DESCEMET MEMBRANE ENDOTHELIAL KERATOPLASTY (DMEK): 10-YEAR CLINICAL OUTCOMES AND GRAFT SURVIVAL

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Purpose To evaluate graft survival and clinical outcomes up to 10 years after Descemet membrane endothelial keratoplasty (DMEK).

Setting/Venue Retrospective cohort study conducted at the Netherlands Institute for Innovative Ocular Surgery.

Methods 750 consecutive DMEK eyes, not including the very first 25 DMEK eyes that constitute the technique learning curve, were included. Main outcome parameters (survival, best-corrected visual acuity (BCVA), central endothelial cell density (ECD)) was evaluated up to 10-years postoperatively and postoperative complications were documented. Outcomes were analyzed for the entire study group and separately for the subgroup of the first 100 DMEK eyes.

Results For the subgroup of 100 DMEK eyes, 82% and 89% reached a BCVA of ≥20/25 (Decimal VA ≥0.8) at 5- and 10 years postoperatively, respectively, and preoperative donor ECD decreased by 59% at 5 years and 68% at 10 years postoperatively. Graft survival probability for the first 100 DMEK eyes was 0.83 [95% Confidence Interval (CI), 0.75-0.92] and 0.79 [95% CI, 0.70 -0.88] at 5- and 10-years postoperatively, respectively. For the total study group, clinical outcome in terms of BCVA and ECD were comparable, but graft survival probability was significantly higher at 5- and 10-year postoperatively.

Conclusions Most eyes operated in the pioneering phase of DMEK showed excellent and stable clinical outcomes with a promising graft longevity over the first decade after surgery. The increase in DMEK experience resulted in a lower graft failure rate and positively affected longer-term graft survival probability.

38 LYOPHILIZED AMNIOTIC MEMBRANE FOR PTERYGIUM SURGERY: LONG-TERM OUTCOMES

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Purpose To investigate the tolerability, security and long-term efficacy of lyophilized amniotic membrane (LAM) as an alternative to cryopreserved amniotic membrane in pterygium surgery.

Material and Methods Prospective case series of patients with primary nasal pterygium who undergone pterygium surgery and LAM implant either with sutures or glue. Postoperative follow-up was until month 24. Clinical and cosmetic outcomes, quality of life (as ocular comfort), and complications were evaluated.

Results LAM was stiff and easy to manipulate as well as no tearing occurred during surgery or suturing. 4 patients (3 males) had pterygium surgery and LAM implant two with sutures and the other two with glue. Ocular comfort was checked and similar among those patients with LAM glued or sutured. After 24 months, there were no issues about tolerability or adverse events. Lower cosmetic outcomes (recurrence) were stated in 3 patients.

Conclusion Our study showed that LAM could be an effective alternative to cryopreserved amniotic membrane for graft after pterygium excision surgery. Its main advantage, storage at room temperature, can make it of immediate availability. Further studies comparing clinical outcomes of pterygium surgery with cryopreserved amniotic membrane versus LAM would confirm the benefits of the last.