

Cornea, External Disease & Refractive Surgery

E-00008

Effect of mitomycin C on corneal endothelium in recurrent pterygium surgery

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ABSTRACT (AS SUBMITTED)

Purpose: The aim of the study was to evaluate the changes in endothelial cell counts in patients after pterygium surgery with MMC 0.02%.

Methods: This prospective study included 20 consecutive patients who underwent pterygium surgery with conjunctival autograft (PECA) and MMC for recurrent pterygium and 20 patients who underwent PECA alone for primary pterygium removal (control group). Following the pterygium excision of the head and body of the pterygium, a surgical sponge soaked with MMC 0.02% was placed on the exposed sclera for 2 minutes, with the conjunctival layer draped over the sponge. Thereafter, the sclera was irrigated with balance salt solution and surgery was completed. Endothelial images were acquired at the center of the cornea with a specular microscope before surgery and at one week, one month, and three months following surgery.

Results: Mean preoperative endothelial cell counts were 2254 ± 128 cells/mm². We will look at the percentage of postoperative cell loss at one week, one month, at three months. The difference in cell counts from the preoperative value will be evaluated.

Conclusions: A 2-minute intraoperative application of MMC 0.02% to the bare sclera during pterygium surgery has no immediate or any significant effect on endothelial cell density.

Cornea, External Disease & Refractive Surgery

E-00009

Extensive versus limited subconjunctival pterygium excision with conjunctival autograft: outcomes and recurrence rate

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ABSTRACT (AS SUBMITTED)

Purpose: To compare the long-term outcomes and recurrence rate of extensive versus limited subconjunctival pterygium excision with conjunctival autograft.

Methods: This retrospective study included 161 consecutive patients who had pterygium excision with conjunctival autograft at the cornea service, Toronto Western Hospital. 91 of them had limited pterygium excision, and 71 had extensive pterygium excision with conjunctival sparing. Main outcome measures included the recurrence rate and risk factors for recurrence.

Results: The recurrence rate in the partial excision group was 9.9% compared with only 4.3 % in the extensive pterygium excision group ($p=0.29$). The mean time to recurrence was significantly shorter with limited excision compared to extensive excision (3.6 vs. 5.3 months respectively, $p=0.04$). In multivariate regression analysis, only younger age and worse preoperative visual acuity were significantly associated with recurrence.

Conclusions: Both limited and extensive pterygium excision groups had low recurrence rates. The extensive subconjunctival pterygium excision group tended towards fewer recurrences which occurred later.

Cornea, External Disease & Refractive Surgery

E-00010

Evaluation of intraocular lens power calculation methods after myopic laser refractive surgery
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ABSTRACT (AS SUBMITTED)

Purpose: To evaluate the accuracy of corneal power estimation methods in conjunction with popular formulas for determining intraocular lens (IOL) power after myopic laser refractive surgery.

Methods: This was a retrospective chart review of post-refractive IOL implants at our practice between the years 2004-07. A total of 18 patients operated on for cataracts which had prior PRK (Photorefractive Keratectomy) or LASIK (Laser-Assisted in-Situ Keratomileusis) for myopia were included in the study. True IOL power was back-calculated using the stable postoperative manifest refraction and implanted IOL power. The Holladay (I and II), SRK/T, Hoffer Q and Haigis formulas were evaluated in conjunction with the R-Factor, Shammas.cd, Laskany, Aramberri Double-K and the "gold standard" Clinical History Method (CHM) amongst a number of other corneal power adjustment techniques. The relatively new, no-history Haigis-L and Shammas.PL formulas were also included in the analysis.

Results: The top performing formulas in terms of overall accuracy and minimizing hyperopic "refractive surprises" were the Shammas.PL, Laskany SRK/T and the Haigis-L which resulted in 78% (15/18), 67% (12/18) and 50% (9/18) of the eyes within $\pm 0.5D$ spherical equivalent, respectively. The popular Haigis, Holladay II and SRK/T with the CHM performed poorer with 45% (8/18), 33% (6/18) and 33% (6/18) of the eyes within $\pm 0.5D$ spherical equivalent, respectively.

Conclusions: IOL calculation after laser refractive surgery remains a challenge. Attesting to this is the abundance of corneal power estimation techniques and IOL formulas available. Based on our preliminary data, the Shammas.PL, Laskany SRK/T and Haigis-L are more accurate and result in less hyperopic "refractive surprises" than the popular Holladay II, Haigis or SRK/T used with the Clinical History Method. The Shammas.PL and Haigis-L have the added benefit of not requiring laser refractive surgical history which is often unavailable or of questionable accuracy.

Cornea, External Disease & Refractive Surgery

E-00011

Visual outcome, refraction, and wavefront aberrations before and after pterygium surgery
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ABSTRACT (AS SUBMITTED)

Purpose: To determine visual outcome, refraction and higher order aberrations before and after surgery for pterygium.

Methods: Data were drawn from a retrospective study of patients that had undergone pterygium excision at Toronto Western Hospital, Toronto, Ontario, Canada, between February and December 2007. All the patients in this study (15 patients, 17 eyes) were operated in one or both eyes by the same surgeon, to ensure consistency. Visual acuity, refraction, corneal topographies and high order eye aberrations, were determined prior to and 3 months after surgery. Wavefront aberrations were derived for a 4.0-mm and 6.0-mm pupil using Zernike polynomial expansion. Pre- and postoperative changes were assessed for significance using paired Students' t-test.

Results: Data was available on 17 eyes (mean age 45 ± 11 years [range: 24-62 years]). The respective parameter values (mean \pm SD) before and after surgery were; best-corrected visual acuity was 20/25 preoperatively and 20/20 postoperatively ($P < 0.02$), manifest cylinder astigmatism was 1.39 ± 1.23 Diopter (D) preoperatively and 0.67 ± 0.79 D postoperatively ($P < 0.05$). All Zernike modes were elevated preoperatively. The total higher order root mean square (RMS) wavefront aberration was 1.25 ± 1.06 and 2.88 ± 2.15 micron in 4.00 and 6.00 mm pupil, respectively. Pterygium excision reduced wavefront aberrations across all modes and orders. Postoperative total higher order RMS was 0.82 ± 0.53 micron ($P < 0.09$) and 1.91 ± 1.18 micron ($P < 0.05$) at 4.00 mm and 6.00 mm pupil, respectively.

Conclusions: Surgical excision may improve visual acuity, reduce manifest cylinder and the likelihood of residual aberrations in eyes with pterygia.

Cornea, External Disease & Refractive Surgery

E-00012

Clinical and pathological correlations of penetrating keratoplasties at the University of British Columbia

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ABSTRACT (AS SUBMITTED)

Purpose: The aims of the present study were to: i) characterize the indications for PKPs at the University of British Columbia and ii) to correlate the pre-operative clinical indications and the pathological diagnoses.

Methods: A retrospective review of pathological records from corneal buttons submitted to the Department of Pathology from January 1, 1995 to December 31, 2002 was completed. A total of 3197 records were reviewed.

Results: The top five clinical indications provided for transplant were bullous keratopathy (18%), regrant (17%), keratoconus (14%), scarring (with or without inflammation; 12%) and Fuchs dystrophy (9%). Similarly, the top five pathological diagnoses were bullous keratopathy (22%), regrant with endothelial failure (19%), keratoconus (16%), scarring (without inflammation or neovascularization; 15%) and Fuchs dystrophy (13%). There was no significant change in the frequency of these clinical or pathological diagnoses over the duration of the study. In the majority of cases (78%), the clinical and pathological diagnoses were consistent with one another. On the contrary, in 5% of the records reviewed, the clinical and pathological diagnoses did not correlate. Accounting for 42% of these cases, the clinical and pathological features of Fuchs dystrophy and pseudophakic bullous keratopathy were often confused. Compared with a similar study performed at UBC (1978 - 1987), we observed an increased frequency of regrafts. Of the 556 regrafts completed, endothelial failure was seen in 95%. In these cases, the common contributing factors include scarring (39%), keratitis/infective crystalline keratopathy (28%) and the development of a retrocorneal membrane (14%).

Conclusions: The results are discussed in light of previous similar studies. In addition, we consider the insights provided by comparing clinical and pathological findings.