Summaries from the international literature

Summarized by:
Dr David H. Y. Chan, FRCS, FCOphthHK, Chun-Yu Ko,† FRCS, FCOphthHK, and Emily F. Y. Yeung,‡ FRCS, FCOphthHK*

Role of reinsertion of the lower eyelid retractor on involutional entropion

R Caldato, R Lauande-Pimentel, NA Sabrosa, et al.
*Br J Ophthalmol 2000;84:606-608.**

The authors presented a paper to verify and evaluate the effects of reinsertion of the lower eyelid retractor aponeurosis to correct involutional entropion. They claimed that involutional entropion occurs mainly in the lower eyelid of patients older than 60 years. They proposed a surgical technique that is based on the reinsertion of the lower eyelid retractor aponeurosis to the anterior inferior surface of the inferior tarsal plate. 30 patients with involutional entropion were randomly selected to receive reinsertion of the lower eyelid retractor aponeurosis to the tarsal plate, without horizontal shortening or resection of the skin or orbicularis muscle. The results were encouraging. 96.6% of patients showed good anatomical and functional correction and no recurrences were observed at the 29-month follow-up examination. The cosmetic result was quoted to be "very satisfactory". The authors concluded that this procedure is effective and has a low recurrence rate, and they highlighted the importance of the reinsertion of the lower eyelid retractor aponeurosis in this surgical correction. This is a small series but a surprisingly high success rate was demonstrated. Recurrent entropion is always a difficult issue and this paper serves to provide an alternative to the traditional methods such as Jones procedure and other more difficult procedures.

Efficacy and safety of cyclosporin A ophthalmic emulsion in the treatment of moderate-to-severe dry eye disease: a dose-ranging, randomized trial.

D Stevenson, J Tauber, BL Reis, for the Cyclosporin A Phase 2 Study Group.
*Ophthalmology 2000;107:967-974.**

The authors presented a paper to investigate the efficacy, safety, formulation tolerability, and optimal dosing of a novel cyclosporin A oil-in-water emulsion formulation for the treatment of moderate-to-severe dry eye disease. This was a randomized, multicenter, double-masked, parallel-group, dose-response controlled trial. They enrolled 162 patients, with 129 in the cyclosporin A group and 33 in the vehicle group. Patients were instructed to instill the study medication (cyclosporin A ophthalmic emulsion 0.05%, 0.1%, 0.2%, or 0.4%, or vehicle) twice daily into both eyes for 12 weeks, followed by a 4-week post-treatment observation period. The following were the main outcome measures: rose bengal staining, superficial punctate keratitis, Schirmer tear test, symptoms of ocular discomfort, and the Ocular Surface Disease Index (OSDI; a measure of symptom frequency and impact on vision-related functioning).

The safety of the study medication was observed and monitored by clinical biomicroscopy, cyclosporin A blood levels, conjunctival microbiology, intraocular pressure, visual acuity, and monitoring of adverse events. In a subset of 90 patients with moderate-to-severe keratoconjunctivitis sicca, the most significant improvements with cyclosporin A treatment were in rose bengal staining, superficial punctate keratitis, sandy or gritty feeling, dryness, and itching, with improvements persisting into the post-treatment period for some patients. There was also a decrease in OSDI scores, indicating a decrease in the effect of ocular symptoms on patients' daily lives. There was no clear dose-response relationship, but cyclosporin A 0.1% produced the most consistent improvement in objective and subjective end points and cyclosporin A 0.05% gave the most consistent improvement in patients' symptoms. The vehicle also performed well, perhaps because of its long residence time on the ocular surface.

There were no significant adverse effects, no microbial overgrowth, and no increased risk of ocular infection in any treatment group. The highest cyclosporin A blood concentration detected was 0.16 ng/ml. All treatments were well tolerated by patients. Based on the above observations the authors concluded that cyclosporin A ophthalmic emulsions 0.05%, 0.1%, 0.2%, and 0.4% were safe and well tolerated, significantly improved the ocular signs and symptoms of moderate-to-severe dry eye disease, and decreased the effects of the disease on vision-related functioning. Cyclosporin A 0.05% and 0.1% were deemed

the most appropriate formulations for future clinical studies because no additional benefits were observed with the higher concentrations.

Amniotic membrane transplantation for acute chemical or thermal burns

D Meller, RT Pires, RJ Mack, et al.
*Ophthalmology 2000;107:980-989. Discussion 990.**

The authors presented a paper to determine whether preserved human amniotic membrane (AM) can be used to treat ocular burns in the acute stage. The study was a prospective, noncomparative, interventional case series. They recruited 13 eyes of 11 patients with acute burns, of which 10 eyes were chemically injured and three were thermally injured. The patients had been treated in seven different centers. All patients received amniotic membrane transplantation (AMT) within 2 weeks of the injury. The success of intervention was measured by the integrity of the ocular surface epithelium and visual acuity during 9 months of follow-up. The authors presented the results as follows: 10 patients were male and one was female; most were young (38.2 ± 10.6 years). During the follow-up period of 8.8 ± 4.7 months, 11 of 13 eyes (84.63%) showed epithelialization within 2 to 5 weeks (23.7 ± 9.8 days), and final visual acuity improved ≥ 6 lines (six eyes), 4 to 5 lines (two eyes), and 1 to 3 lines (two eyes); only one eye experienced a symblepharon. Eyes with grade II to III burns showed more visual improvement (7.3 ± 3.0 lines) than those with burns of grade IV (2.3 ± 3.0 lines; $P < 0.05$, unpaired t test). In the group with grade II or III burns, none had limbal stem cell deficiency. All eyes in the group with grade IV burns did experience limbal stem cell deficiency. The authors concluded that amniotic membrane transplantation is effective in promoting re-epithelialization and reducing inflammation in acute chemical and thermal injury. It also prevented the scarring sequelae in the late stage. In mild to moderate burns, AMT alone rapidly restored both corneal and conjunctival surfaces. In severe burns, however, it restored the conjunctival ocular surface without symblepharon formation and AMT also reduced limbal stromal inflammation, but did not prevent limbal stem cell deficiency. These results highlighted the importance of immediate intervention in eyes with a severely damaged ocular surface, as in acute chemical or thermal injury. Further prospective randomized studies including a control group are required to determine the effectiveness of AMT in acute chemical and thermal burns of the eye. This is a small series with many uncontrolled factors involved. It did, however, show the anti-inflammatory effects of amniotic membrane in clinical situations such as severe ocular burns.

A new surgical technique for management of conjunctivochalasis

I Otaka, N Kyu.
*Am J Ophthalmol 2000;129:385-387.**

The authors presented a paper on a new surgical technique for severe, symptomatic conjunctivochalasis and their hypothesis of the pathogenesis of the condition. They recruited six eyes of three patients with conjunctivochalasis (average age 70.0 ± 9.6 years; range, 56-78 years) and all were treated with a procedure that fixed the conjunctiva to the sclera with three 6-0 vicryl sutures. With a mean follow-up period of 209.5 days (range, 181-219 days), the authors claimed to have achieved successful treatment in all recruited eyes, with no recurrence of conjunctival folds. They concluded that conjunctivochalasis could be successfully treated with conjunctival fixation to sclera.

The authors also postulated that the conjunctival folds were caused by the folding and elevation of loosely adherent bulbar conjunctiva of the lower eyelid. This paper highlights the often forgotten clinical situation of conjunctival chalasis, which causes problems for many patients. Though the authors only presented a small case report series, the technique, concepts, and arguments produced were sound.

Ocular optical aberrations after photorefractive keratectomy for myopia and myopic astigmatism

T Seiler, M Kaemmerer, P Mierdel, HE Krinke.
*Arch Ophthalmol 2000;118:17-21.**

The authors presented a paper studying the effects of photorefractive keratectomy on ocular optical aberrations and establishing correlations with glare vision and low-contrast vision. They studied the preoperative ocular aberroscopy of 15 eyes undergoing photorefractive keratectomy and compared them with aberroscopy 3 months postoperatively by the automated aberroscope of the Tscherning type. The correlation of the wavefront errors with best spectacle-corrected visual acuity, low-contrast visual acuity, and visual acuity under glare conditions were analyzed.

The authors found that in all treated individuals, the total wavefront error increased. On average, the total wavefront error increased by a factor of 17.65, a highly statistically significant increase ($P = 0.001$). Also, the correlations with best-corrected visual acuity, low-contrast visual acuity, and glare visual acuity were statistically significant ($P = 0.02$, $P = 0.001$, and $P = 0.03$, respectively). The increase in ocular aberrations was significantly related to the virtual pupil size. The authors concluded that photorefractive keratectomy increased the ocular aberrations and therefore impaired the visual performance of the treated eyes. Scotopic visual measures such as low-contrast visual acuity and glare visual acuity were most affected by the myopia correction.

The authors proposed that aberroscopy-guided photo-refractive keratectomy may avoid such effects. The concept of wavefront and aberroscopy is fast becoming the latest innovation in ophthalmology. The introduction of this new technology is very exciting and this paper highlighted the pitfalls of the current photorefractive practices. Much physical data were presented and the results were skewed against the current practice.

Polypoidal choroidal vasculopathy masquerading as central serous chorioretinopathy

LA Yannuzzi, B Freund, M Goldbaum, et al.
Ophthalmology 2000;107:767-777.†

This is a retrospective, observational case study, with the aim of differentiating polypoidal choroidal vasculopathy (PCV) from central serous chorioretinopathy (CSC). 13 patients, aged from 26 to 64 years (average age, 54 years), who were originally suspected of having CSC for many years were further evaluated. A complete ophthalmologic clinical examination, including a fundus contact lens examination and indirect ophthalmoscopy was performed. Fluorescein angiography and indocyanine green angiogram was also obtained. These patients were ultimately diagnosed as having PCV. The clinical diagnosis of CSC or PCV generally poses little challenge to retinal specialists. However, in CSC with persistent, recurrent exudation, a myriad of secondary retinal pigment epithelial changes may evolve, making it difficult to differentiate these two entities. Since these entities differ in their natural course, visual prognosis, and response to treatment, it is recommended that indocyanine green angiogram should be performed for suspicious cases of CSC, particularly for:

- Patients who are generally not at risk for CSC on the basis of age, sex, or race
- Eyes with persistent detachments associated with lipid
- Recurrent detachments with subretinal blood.

Intraocular lidocaine in phacoemulsification: an endothelium and blood-aqueous barrier permeability study

MT Iradier, C Fernandez, P Bohorquez, et al.
Ophthalmology 2000;107:896-901.†

The use of intraocular 1% lidocaine hydrochloride (HCl) has become popular in phacoemulsification as an adjunct to topical anesthesia. The advantages of quick visual recovery and lack of complications over invasive anaesthetic techniques are currently accepted. However, the effects of 1% lidocaine (HCl) on the corneal endothelium and blood aqueous barrier permeability have not yet been widely investigated. In this study, 60 patients who underwent uneventful cornea phacoemulsification were prospectively studied. Sub-tenon's anesthesia was administered to 30 patients, and intraocular lidocaine HCl was administered to a second group of 30 patients. An endothelial study using a non-contact specular microscope, and a digital image analysis system, was performed before surgery and 1 month after surgery. Blood-aqueous barrier permeability was evaluated pre- and postoperatively (48 hours, 1 week, and 1 month) using a laser flare meter. No significant differences were found between the groups when comparing the postoperative changes produced in endothelial cell density, hexagonality, and coefficient of variation in cell area. There was also no clinically significant difference between the preoperative and 1 month postoperative flare values in either group. The authors concluded that the administration of 1% unpreserved lidocaine HCl to the anterior chamber induced no further damage to the corneal endothelium and the blood aqueous barrier other than that produced by phacoemulsification.

Endophthalmitis after pediatric strabismus surgery

FM Recchia, CR Baumal, A Sivalingam, et al.
Arch Ophthalmol 2000;118:939-944.†

Pediatric endophthalmitis is uncommon and, in most cases, is the result of trauma. This is even rarer following strabismus surgery. The authors conducted a retrospective review of initial signs, clinical findings, treatment, culture results, and visual and anatomical outcomes in six eyes of six children treated at the Wills Eye Hospital and the New England Eye Center during a 15-year period. All the children developed endophthalmitis after strabismus surgery. In this series, four important signs of lethargy, asymmetric eye redness, eyelid swelling, and fever, developed at a median of 3 days after strabismus surgery. Organisms isolated included *Streptococcus pneumoniae, Haemophilus influenzae*, and *Staphylococcus aureus*. The first two are quite unique in children. The development of endophthalmitis does not require globe perforation, which was not recognized in any patient in the present series. All eyes became blind. The authors made the following recommendations concerning the prevention and early diagnosis of endophthalmitis after pediatric strabismus surgery:

- Young children may not be able to verbalize symptoms, and therefore educating parents about the signs of endophthalmitis, and a high index of suspicion, is imperative.
- The standard for prophylaxis following strabismus surgery cannot be defined due to the rarity of endophthalmitis. However, the use of preoperative povidone-iodine and postoperative topical antibiotics may be prudent.
- Informed consent for strabismus surgery should include this rare but real risk of blindness due to endophthalmitis.

Presumed rhegmatogenous retinal detachment in patients with retinoblastoma

TH Lim, DM Robertson.
Retina 2000:20:22-27.†

Rhegmatogenous retinal detachment (RD) has been reported to occur in eyes treated for retinoblastoma. The authors describe their experience treating five eyes with presumed rhegmatogenous RD that occurred after eye-sparing treatment for retinoblastoma. In a retrospective review of 129 eyes treated over a 26-year period, 45 eyes were found to have received eye-sparing treatment. Five (11%) of these eyes were complicated with presumed rhegmatogenous RD during or after treatment. All five eyes had extensive tumors of grade III and higher according to the Reese-Ellsworth

Classification. All received external beam radiation with a standard dose of approximately 4500 Gy. Four also received cryotherapy and chemotherapy was given to two patients. It is postulated that eyes with large or multiple tumors requiring extensive treatment may be associated with extensive tumor necrosis, which predisposes eyes to the formation of retinal breaks. Also dense calcifications over the tumor constitute a rigid elevation in the damaged and thinned retina, and may be responsible for the development of some retinal breaks. Because of the presence of calcification, fibrosis, and pigmentation in the areas affected by retinoblastoma, retinal breaks can be very difficult to detect. Retinal breaks were documented in only one patient. All patients received scleral buckling surgeries. The detachments were totally reattached in three eyes and partially reattached in the other two. To minimize the potential risk of spread of malignancy intraoperatively, it is recommended that a long disease-free interval be ensured before scleral buckling (2 to 19 months after diagnosis of RD), and that special precautions be taken during subretinal fluid drainage.

Reconstruction of damaged corneas by transplantation of autologous limbal epithelial cells

RJF Tsai, LM Li, JK Chen.
N Engl J Med 2000;343:86-93.‡

Starting from the first report of limbal epithelial transplant in ocular surface reconstruction, researchers have tried to expand limbal stem cells *in vitro*. In this article, the authors reported the successful outcomes of transplantation of autologous limbal epithelial cells cultured on amniotic membrane. The study enrolled six patients with partial or total limbal deficiency in one eye. Limbal biopsies of the healthy contralateral eyes were performed. The limbal tissue was 1 x 2 mm in size containing epithelial cells and part of the corneal stroma. The limbal tissues were then cultured in a special medium and later inoculated onto the basement membrane side of the amniotic membrane. After 2 to 3 weeks, the cultured limbal epithelial cells with amniotic membrane were transplanted to the diseased eyes. The mean follow-up period was 15 ± 2 months. Complete reepithelialization of the corneal surface occurred within 2 to 4 days in all six eyes. In five of the six eyes (83%), the mean visual acuity improved from 20/112 to 20/45. In one patient with a chemical burn and complete opacification of the cornea, the acuity improved from counting fingers at 40 cm to 20/200. No patient had recurrent neovascularization or inflammation in the transplanted area during the follow-up period.

Topical mitomycin-C for subepithelial fibrosis after refractive corneal surgery

PA Majmudar, SL Forstot, RF Dennis, et al.
Ophthalmology 2000;107(1):89-94.‡

Mitomycin-C (MMC) is an antibiotic derived from *Streptomycces caespitosus*. It was originally used as a systemic chemotherapeutic agent. In past years, it has found its way into ophthalmology. It is widely used in glaucoma filtering surgery as adjunctive treatment in pterygium surgery. It is also used in the treatment of conjunctival and corneal intraepithelial neoplasia as well as ocular cicatricial pemphigoids and has been found to be a potential modulator of corneal wound healing in experimental models.

The authors presented the results of MMC treatment in eight eyes of five patients with recurrent, visually disabling subepithelial fibrosis. All eyes underwent epithelial debridement followed by single intraoperative application of MMC (0.02%) for 2 minutes with saline irrigation. The mean follow up period was 13.8 months (6 to 25 months). In all cases, the corneas remained clear with no recurrence during the follow up period. All best corrected visual acuities were improved with no adverse reactions.

Incidence of vitreoretinal pathologic conditions within 24 months after laser *in situ* keratomileusis

JF Arevalo, E Ramirez, E Suarez, et al.
Ophthalmology 2000;107(2):258-262.‡

As refractive procedures become more popular, there are reports in the literature about vitreoretinal complications occurring after such procedures. Whether they are true complications or coincidence is still debatable. In this retrospective study, the authors reviewed the records of all laser *in situ* keratomileusis (LASIK) cases performed from August 1995 to August 1998 at five institutions. A total of 29,916 eyes (83.2% were myopic) ranging from -0.75 D to -29.0 D (mean -6.29 D) and from +1.00 D to +6.00 D (mean +3.23 D) were included. Twenty eyes (17 patients) with LASIK-related complications were presented.

The incidence of vitreoretinal complications were 0.06%. Fourteen eyes experienced rhegmatogenous retinal detachments (RD). Two eyes had corneoscleral perforations from the keratome with one patient developing vitreous hemorrhage and the other patient later having a RD. Four eyes were found to have retinal tears, which were treated with argon laser. In one eye, juxtafoveal choroidal neovascularization (CNV) developed. The RD and the CNV were treated surgically. The authors concluded that serious complications were infrequent and that it was very important to inform patients that LASIK only corrects the refractive aspects of myopia and that the complications of myopia still persist.

Oral acyclovir for herpes simplex virus disease: effect on prevention of epithelial keratitis and stromal keratitis

Herpetic Eye Disease Study Group.
Arch Ophthalmol 2000;118:1030-1036.‡

This is one of the latest publications of the Herpetic Eye Disease Study Group. This is a randomized, double-masked clinical trial in which 703 immunocompetent patients

with prior herpes simplex virus (HSV) eye diseases within the preceding year were assigned to receive oral acyclovir 400 mg twice daily (357 patients) for a year or placebo (346 patients).

Patients were followed up during the 12-month treatment period for the development of HSV eye disease. The cumulative probability of a recurrence of any type of ocular HSV disease during the 1-year treatment period was 19% in the acyclovir group compared with 32% in the placebo group. Sixteen patients in the acyclovir group and 30 in the placebo group had more than one recurrence. Acyclovir reduced the risk of all forms of recurrent eye disease by about half.

Treatment had a beneficial effect on ocular surface recurrences, such as blepharitis, conjunctivitis, and epithelial keratitis as well as the deeper forms such as stromal keratitis and keratouveitis. The benefit of acyclovir in preventing epithelial keratitis was seen in patients with or without a prior history of epithelial keratitis whereas the beneficial effect on preventing stromal keratitis was limited to patients with a history of stromal keratitis. The authors concluded that long term suppressive oral acyclovir therapy reduced the risk of recurrent epithelial and stromal keratitis.

Interface fluid associated with diffuse lamellar keratitis and epithelial in-growth after laser *in situ* keratomileusis

WA Lyle, GJC Jin.
J Cataract Refract Surg 1999;25:1009-1012.‡

'Sands of Sahara syndrome' or diffuse lamellar keratitis (DLK) is a potentially sight-threatening complication of laser *in situ* keratomileusis (LASIK). It is a relatively new entity with no known cause. In this article, the author reported yet another new complication of LASIK in which an accumulation of interface fluid is associated with epithelial in-growth and a prolonged course of DLK resistant to topical steroids. The patient was a 40-year-old male who underwent an uneventful bilateral myopic LASIK. DLK developed 1 week after the LASIK. An accumulation of fluid was found in the left eye 20 days postoperatively and 5 months postoperatively in the right eye. Dry eye syndrome and steroid-induced intraocular pressure elevation were also present in this patient. Surgical removal of the epithelial in-growth and drainage of the fluid combined with medical treatment resulted in resolution of the inflammation. Cytopathologic examination of the fluid showed epithelial cells without signs of inflammation.