reported a case of mucoepidermoid carcinoma presenting as orbital apex syndrome in a 33-year-old man with a 2 month history of maxillary discomfort, fullness and purulent discharge. McDonald *et al.*[2] reported a case of adenoid cystic carcinoma which presented as orbital apex syndrome in a patient with preceding history of facial numbness.

This case is unique both in that the patient had no ENT symptoms prior to his presentation to the ophthalmologist and as regards the short history of his symptoms, during which time the tumour had grown to inoperable dimensions. Orbital apex syndrome can be a presenting sign of maxillary sinus squamous cell carcinoma. Prompt ENT referral is recommended in these cases.

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Sir,

Clear tectonic penetrating graft using glycerine-preserved donor cornea

Corneal blindness is more prevalent in the developing countries than in the Western world. The demand for donor eyes for corneal transplantation greatly surpasses the available supply of viable tissue. In the developed world, newer and better preservative media such as optisol have been introduced.[1] But in the developing countries, donor corneas stored in McCarey Kaufman (M-K) medium and a moist chamber at 4 °C are mostly used for penetrating keratoplasty.[2] Paucity of quality donor tissues often compels the corneal surgeons in the developing world to use glycerine-preserved corneas for lamellar or emergency tectonic penetrating keratoplasty. Clear lamellar grafts have been reported with the use of donor cornea preserved in glycerine for extended periods up to 23 years.[2] To our knowledge there is no reported case of a tectonic penetrating graft having remained clear, using donor cornea preserved in glycerine. The authors report on a clear tectonic penetrating graft using donor cornea preserved in glycerine (50%) at room temperature (30 °C) for 4 weeks.

Case report

A 32-year-old woman presented to our Cornea Service with complaints of pain, redness and watering in the left eye for 4 weeks. The patient had been diagnosed as having a perforated bacterial corneal ulcer by the referring ophthalmologist. She had been prescribed ciprofloxacin 0.3% eye drops 2-hourly and cyclopentolate hydrochloride 1% eye drops 8-hourly. She was not a contact lens wearer. She did not volunteer a history of trauma, use of topical corticosteroids or other predisposing factors for infective keratitis. She had had a similar attack of pain, redness and diminution of vision in the left eye at the age of 3 years. Her symptoms had then subsided with topical antibiotic drops. The patient had then developed an opacity in the inferior half of the left cornea. Poor vision led to a gradual divergence of the left eye.

On presentation, she had best-corrected visual acuity of 6/6 in the right eye and counting fingers at 30 cm in the left eye. The patient had a left divergent squint of 40 prism dioptres. Slit-lamp biomicroscopy of the left eye revealed circumciliary congestion and a large mid-peripheral corneal perforation (4.2 × 4.2 mm) in the inferior half of the cornea. Iris plugged the site of the perforation and a thin layer of epithelium covered the iris surface. There was an area of corneal thinning (approximately 0.75 mm wide) all around the corneal perforation. In addition, there was an opacity in the inferior half of the cornea (Fig. 1). The anterior chamber was shallow. A positive Seidel's test confirmed an

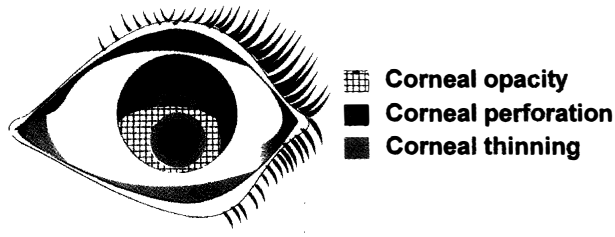

Fig. 1. *Diagram showing corneal perforation surrounded by corneal thinning and opacity.*

aqueous leak. Corneal sensation in the left eye was decreased. A clinical diagnosis of neurotrophic keratitis was made in view of the corneal opacity, decreased corneal sensations and corneal thinning. Examination of the right eye did not reveal any abnormality.

A tectonic penetrating keratoplasty was planned. Donor cornea stored in glycerine (50%) at room temperature (30 °C) was used. Eye bank data revealed the donor to be a 28-year-old man who had died in a vehicular accident. The death to enucleation interval was 4 h. Whole globe was preserved in a moist chamber (4 °C) for 48 h. As the donor cornea could not be used for an optical penetrating graft within 48 h, the corneoscleral button was excised and preserved in glycerine (50%) for 4 weeks at room temperature (30 °C).

Penetrating keratoplasty was performed under local anaesthesia. At the time of surgery, the glycerine-preserved corneal button was relatively inelastic, thin and transparent. After immersion in normal saline for 30 min it became softer, thicker and relatively opaque. Donor button of 5.5 mm diameter was punched out from the corneoscleral ring using a Teflon block and a disposable trephine. The donor button was secured to the 5.5 mm recipient bed using eight interrupted 10-0 monofilament nylon sutures. Subconjunctival gentamycin 20 mg and dexamethasone 4 mg were injected at the end of the surgery. The patient was administered ciprofloxacillin 0.3% drops four times daily, betamethasone 0.3% six times daily and cyclopentolate hydrochloride 1% twice daily. The patient was closely monitored for epithelial healing, intraocular pressure and anterior chamber inflammatory reaction. The epithelium healed during the first week, and the graft thickness gradually decreased and clarity improved during the second week. Histopathological examination of the recipient button revealed chronic inflammation, thinning and perforation. Special stains did not reveal any bacterial, fungal or protozoal pathogen.

At 6 months follow-up, the loose sutures were removed. The patient had a visual acuity of 3/60 and an intraocular pressure of 16 mmHg. A left divergent squint of 40 prism dioptres persisted. The graft was clear and of normal thickness. The thickness at the centres of the graft and the recipient cornea were 538 and 546 μm, respectively. High-power slit-lamp biomicroscopy revealed a prominent inner reflex of the corneal parallelogram of the graft indicating a relatively thicker Descemet's membrane in the graft compared with the host cornea. Specular reflection[3] revealed polymegathism in the donor corneal endothelium. The fundus examination was unremarkable.

At 8 months follow-up the patient developed a neurotrophic epithelial defect in the centre of the graft. A paramedian tarsorrhaphy was done and the epithelial defect healed over 2 weeks, but resulted in a superficial opacity in the corneal graft (Fig. 2). Due to amblyopia in the grafted eye, subsequent optical penetrating keratoplasty was not considered. At 5 years follow-up the graft was clear except for a superficial corneal opacity. The thickness at the centres of the graft and the recipient cornea was 532 and 548 μm, respectively. High-power slit-lamp biomicroscopy revealed a thicker Descemet's membrane and relatively more polymegathism in the graft endothelium as compared with the host cornea.

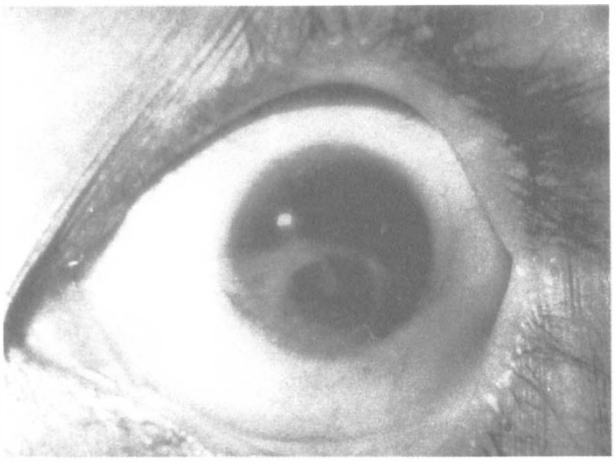

Fig. 2. *Clear penetrating graft following the use of glycerine-preserved cornea.*

Comment

Transparency of a corneal graft is a result of active pump function of the endothelium. In contrast to rabbits, corneal endothelium in cats and primates including human beings heals predominantly by cell enlargement and translocation of the viable endothelial cells.[4,5] Since the human endothelium has limited regenerative capacity, the success of penetrating keratoplasty in human beings depends upon an adequate number of functioning donor corneal endothelial cells. Therefore, methods of interim donor corneal storage aim at maintaining endothelial viability.[6] To preserve corneal endothelial cell function, better and newer preservative media such as organ culture[7] and optisol[1] are currently available. In developing countries, due to a shortage of donor eyes, glycerine-preserved grafts sometimes have to be used for lamellar and emergency tectonic penetrating keratoplasty. Failed tectonic penetrating grafts using donor tissue preserved in glycerine are cloudy and oedematous with epithelial bullae and vascularisation. Our patient had a clear tectonic penetrating graft despite using donor cornea preserved in 50% glycerine at room temperature (30 °C) for 4 weeks.

It is interesting to speculate on various possible mechanisms that could have resulted in a clear graft in our patient. In a moist chamber at 4 °C, the upper time limit for endothelial cell survival is generally thought to be approximately 72 h.[8] Corneal endothelial viability is maintained in organ culture at 37 °C for periods up to 35 days.[9] Donor corneal endothelial cells could not have survived in glycerine (50%) at 30 °C for 4 weeks. The other possible mechanism in the absence of an adequate number of viable donor corneal endothelial cells could be the migration of healthy host corneal endothelial cells across the host–graft junction. The peripherally located

small graft may have been repopulated by endothelial cells from the periphery of the host cornea of a young recipient. Experimental studies on rabbits have revealed endothelial cell migration across the host–graft junction.[10,11] In a study on rabbits using sex chromatin marker, spread of corneal endothelial cells on to the recipient side with absent endothelial cells has been demonstrated.[11] In a recent experimental study on rabbits, migration of host endothelial cells onto the endothelial-deficient graft was observed after 4 days.[12]

This concept of endothelial cell migration has also been proposed by Ohguro *et al.*,[13] who observed that in transplanted corneas the peripheral recipient endothelial cells may migrate and primarily contribute to resurfacing the endothelial defects caused by cataract surgery. They concluded that cataract surgery in eyes with transplanted corneas is safe in cases where the peripheral recipient endothelium has sufficient cell density and normal morphology. Several authors have reported lower success rates in achieving clear grafts in bullous keratoplasty in comparison with eyes in which the recipient cornea has healthy endothelium, viz., corneas with keratoconus, herpetic keratitis, localised leucomatous opacities, etc.[14,15] Rao and Aquavella[16] have observed that in such eyes the peripheral recipient endothelium has a higher cell density and more normal morphology than donor endothelium. Matsubara *et al.*[15] reported through a life-table analysis that the success rate of penetrating grafts in bulbous keratopathy decreased to about 30% over an observation period of 4 years, whereas the rate in keratoconus was maintained at 97.5%. They showed that graft endothelial cells continued to enlarge in bullous keratopathy much more rapidly than in keratoconus.

A young recipient, such as our patient, with a small localised lesion, can also be expected to have a higher endothelial cell density in the rest of the cornea, and these peripheral endothelial cells could have migrated towards and repopulated the grafted cornea resulting in it remaining clear.

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Sir,

Bilateral poliosis and granulomatous anterior uveitis associated with latanoprost use and apparent hypotrichosis on its withdrawal

Latanoprost is an effective long-acting prostaglandin $F_{2\alpha}$ analogue which lowers intraocular pressure by increasing uveoscleral outflow. Since its widespread clinical use in the medical treatment of glaucoma several side effects have surfaced including skin rash,[1] hypertrichosis, hyperpigmentation of eyelashes,[2,3] corneal psudodendrites,[3] iris hyperpigmentation, anterior uveitis,[5] choroidal effusions and cystoid macular oedema.[6] We report a case of bilateral poliosis and granulomatous anterior uveitis during treatment with latanoprost and apparent hypotrichosis on its withdrawal.

Case report

A 77-year-old woman was diagnosed with primary open angle glaucoma in October 1995. Her vision was 6/9 in each eye. The intraocular pressures (IOPs) were 28 mmHg in the right eye and 26 mmHg in the left. The right optic disc and visual fields were essentially normal but the left eye had a cupped disc and a dense superior visual field defect.