Treacher Collins syndrome with novel ophthalmic findings and visceral anomalies

Treacher Collins syndrome (TCS) (mandibulofacial dysostosis (MFD) or zygoma-omandibular dysplasia) is one of a group of congenital malformation syndromes that have in common maldevelopment of the first and second branchial arches. Clinical features typically include hypoplasia of the mandible and zygoma; a complex variety of ear abnormalities including malformed pinnae, atresia of the external auditory canals and anomalies of the middle ear ossicles; cleft palate; reeding chin; and sinus and choanal atresia. We present a pair of twins that possessed not only classic features of TCS but also unusual visceral anomalies, including dual superior vena cava, bilobed right and unilobed left lungs, bilateral renal and ureteral agenesis, rudimentary urinary bladder, and absent epididymides. Twin B was noted to have right sided choanal atresia, soft palate aplasia, hard palate hypoplasia, and a left sided cleft; twin A had no visceral anomalies. Ocular pathological dissection of twin A illustrated bilateral microphthalmia; corneal scleralisation; and maldevelopment of the uvea, lens, and retina. Ocular dissection of twin B revealed microphthalmia, aniridia, congenital cataracts, and bilateral vascularisation of the cornea.

Comment

These twins had multiple features characteristic of TCS, most notably hypoplastic zygoma, maxillae, and related muscles—perhaps the most characteristic features of TCS. In contrast, visceral anomalies, such as those of twin A, are rare. Only two cases have been previously reported: one with trachoeosophageal fistula, rectovaginal fistula, and anal atresia; another with achtalasia. Renal agenesis, found in twin A, has not been previously described in association with TCS. While ophthalmological features in TCS are often extensive, they seldom involve the intraocular structures. Common findings include a defective inferior lateral angle of the orbit, caudal displacement of the superolateral orbit, true and pseudocolumbomas of the lids, lateral canthal dystopia, orbital lipodermoids, corneoscleral dermoids, and microphthalmos. Cata racts, lacrimal duct atresia, pupillary ectopia, distichiasis, and uveal colobomas have been reported less commonly. The intraocular involvement in these twins is rare in TCS. Furthermore, aniridia, corneal scleralisation, and uvea, lens, and retinal maldevelopment are previously unreported.

TCS is an autosomal dominant disorder affecting one in 50,000 live births. The disorder appears to have arisen in these twins with no relevant family history, as occurs in 60% of cases. Expressivity is highly variable, ranging from a clinically undetectable perinatal death secondary to airway compromise; the disease severity that resulted in the fetal death of twin A is highly unusual. The responsible gene, TCOF1, has been mapped to 5q32–33.2 and the structure of its protein product, treacle, elucidated. To date, 51 disease causing mutations have been identified, nearly all resulting in a premature termination codon. Significantly, no relation has been found between any single mutation and phenotype severity. The ophthalmic pathology observed in these twins may have resulted from a focal TCOF1 mutation and a yet to be defined role treacle may have in eye (and renal) development. Considering the number and severity of abnormalities, the failure to identify a single “genetic hot spot,” and the novel ophthalmic features, an alternative and perhaps more likely explanation is that a second gene, itself involved in ophthalmic embryology, was affected along with TCOF1. This unidentified gene may have been disrupted from a translocation involving 5q32–33.2 or from a deletion large enough to result in a contiguous gene syndrome. A final consideration is that these twins may not have had TCS but rather a new though closely related syndrome. Further genetic investigation may shed light upon these speculations.

Acknowledgements

JLP and GB contributed equally to this work.

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References


Figure 1 Gross photographs of fetal twins with features of Treacher Collins syndrome: (A) and (B) are twin B [21 weeks of gestational age]; (C) is twin A [16 weeks of gestational age].
Acute postural drop in optic nerve perfusion after vitrectomy and gas in a patient with diabetic autonomic neuropathy

We report the case of an insulin dependent diabetic who suffered transient blindness as a result of a change of posture following vitrectomy surgery with injection of gas. This 34 year old woman with longstanding diabetic disease, postural hypotension, and proliferative retinopathy had undergone argon laser panretinal photocoagulation (PRP) to both eyes. Her right eye was amblyopic and had visual acuity of counting fingers (CF), whereas the left eye, at best, had vision of 6/12 that was frequently impaired by recurrence of vitreous haemorrhage. She underwent vitrectomy surgery with injection of gas.

Judging by the severity of the visual loss we believe that it was due to obstruction of both the central retinal artery and optic nerve perfusion. The precipitating factor in this case would appear to have been the change in posture from supine to sitting. The presence of gas in the operated eye had raised the intraocular pressure to a level such that the perfusion pressure to the eye was effectively eliminated resulting in a period of no light perception. Restoring the patient to the supine position was sufficient alone to reverse the condition and improve the perfusion of the eye. When the IOP was reduced to normal she was out of this critical situation and was able to maintain the ocular perfusion, even when sitting. Collapse of the central retinal artery is known to occur in conditions of high IOP but vision does not fluctuate with posture. However, it is known that raised IOP also reduces orthograde axonal transport and compromises nerve head perfusion.

Comment

We advise particular caution in diabetics undergoing ocular surgery in which there may be a significant postoperative pressure rise. Similar problems can occur during surgery if hypertensive anaesthesia is either deliberately or inadvertently employed in diabetics. Beware of assuming poor postoperative vision to be purely the result of the presence of haemorrhage or gas; patients may have quite poor vision immediately after vitreoretinal surgery but will rarely have NPL unless there is also optic nerve compromise. We also suggest one should aim to lower postoperative IOP in diabetics.

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References


Optical coherence tomography imaging of severe commotio retinae and associated macular hole

Commotio retinae results in retinal opacification following blunt trauma. Mild commotio retinae usually occurs spontaneously with minimal sequelae but more severe cases are associated with visual loss. We are not aware of any previous reports describing optical coherence tomography (OCT) imaging of severe commotio retinae with an associated full thickness macular hole (FTMH).

Case report

A 15 year old boy presented 24 hours after blunt trauma from a football striking his right eye. On examination his best corrected visual acuity was counting fingers right eye and 6/6 left. Biomicroscopic examination revealed extensive commotio retinae over the posterior pole, no posterior vitreous detachment (PVD), and a FTMH. Colour photography and OCT imaging (OCT 2000 scanner, Zeiss-Humphrey) were performed (Fig 1). OCT confirms a FTMH and demonstrates extensive disruption of photoreceptor outer segments and retinal pigment epithelium (RPE).
He was treated conservatively with a short course of topical steroids. The colour fundus and OCT appearance at 1 month are shown in Figure 2. Despite spontaneous macular hole closure, visual acuity remained at counting fingers at 1 year follow up.

**Comment**

The major site of retinal trauma appeared on OCT to be at the level of the photoreceptor outer segment/RPE interface. The OCT images are consistent with fragmentation of photoreceptor outer segments and damaged cell bodies, as suggested by Sipperley et al in their study of the histological changes in commotio retinae in primates.

The exact pathogenesis of macular holes remains uncertain. Ho et al outlined the three basic historical theories regarding aetiology—the traumatic theory, the cystic degeneration and vascular theory, and the vitreous theory. Of these, the latter has gathered the most support in the context of idiopathic macular holes.

In our case, the OCT imaging reveals that the edges of the macular hole are elliptical and irregular with no associated PVD, cortical vitreous condensation, or overlying prefoveal opacity. The characteristics suggest a different mechanism of hole formation from that proposed in idiopathic senile macular holes. We believe that mechanical distortion of the retina, relative to the vitreous and underlying sclera, created disruption of the photoreceptor outer segment level that the retina has the least support from Müller cells and is therefore likely to undergo greatest deformation.

In the only previous report of OCT imaging in traumatic macular hole, a case with mild commotio retinae was described in which extensive outer retinal disruption was not observed. There have been some encouraging reports suggesting that vitrectomy can successfully close traumatic macular holes as well as improve visual function in many cases. However, it seems unlikely that cases with severe commotio retinae, and associated photoreceptor/RPE damage, as demonstrated in our cases, would gain any benefit from surgical as opposed to spontaneous closure of a traumatic FTMH. The final visual prognosis is severely limited by the extent of initial photoreceptor damage, and the excessive pigment atrophy and clumping that follows.

We believe OCT imaging provides additional information both on the pathogenesis of commotio retinae and in the assessment of outer retina disruption following ocular trauma. This information may help in the selection of patients likely to benefit from surgical intervention.

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**References**


**Acute ocular ischaemia and orbital inflammation associated with systemic lupus erythematosis**

We report a patient with systemic lupus erythematosis (SLE) who developed bilateral ocular ischaemic syndrome in association with orbital inflammation leading to devastating visual loss.

**Case report**

A 73 year old white woman presented with unilateral acute anterior uveitis and polyarthropathy of the hands, knees, and neck. Over the next 4 years she suffered recurrent anterior uveitis, marginal keratitis, and episcleritis, which were treated with topical steroids. She had bilateral age related cataract and underwent left cataract surgery. Postoperatively, her visual acuities were 6/60 right eye and 6/9 left eye.

She was admitted 7 months later with extensive erythematous, scaly plaques on sun exposed areas and a purpuric eruption over the abdomen, buttocks, and legs. Biopsy of a plaque showed changes consistent with SLE including follicular keratin plugging, epidermal atrophy, degeneration of the basal layer with collagen body formation, basement membrane thickening, myxoid change in the dermis, and periappendageal lymphocyte infiltrates. Biopsy of the purpuric eruption was consistent with a leucocytoclastic vasculitis. Further investigations revealed positive rheumatoid factor (1/100), ANA (1/25), pANCA (1/100), and anti-EN antibodies (1/100). There was reduced C 3 and C 4, polyclonal increase in IgA and IgM, lymphopenia, thrombocytopenia, and reduced creatinine clearance but no proteinuria. Anticardiolipin antibodies were negative. A diagnosis of SLE was made and oral prednisolone (0.8 mg/kg) was commenced.

Three weeks later she developed a rapid onset of marked bilateral conjunctival and lid oedema, subconjunctival haemorrhage, and proptosis. Visual acuity deteriorated to perception of light in each eye. There was gross restriction of ocular movements. Signs of ocular ischaemia developed in both eyes with corneal oedema, iris neovascularisation, fibrinous anterior uveitis, hyphaema, and raised intraocular pressure (Fig 1). Computed tomography and B-scan ultrasonography of the orbits showed posterior scleritis, choroidal detachment, vitreous haemorrhage, and thickening of the extraocular muscles (Fig 2).

She was treated with topical dexamethasone 0.1% and corticosterol 1%, oral acetazolamide 500 mg daily, intravenous cyclophosphamide (10 mg/kg) and subsequently intravenous immunoglobulin (0.5 g/kg/day for 5 days). Over the following month there was regression of the proptosis, conjunctival and lid oedema, corneal oedema, and fibrinous uveitis. The intraocular pressure was controlled and the visual acuity remained perception of light in each eye. Subsequently, the patient developed pneumonia, Vth nerve palsy, left sided hemiparesis, and died 7 weeks after admission. Postmortem examination revealed bronchopneumonia, lung abscess, pleural effusions, fibrinous pericarditis, cardiomegaly, and jejunal mucosal haemorrhages.

**Figure 1** Anterior segment of right eye showing conjunctival injection, corneal oedema, hyphaema, rubecois iridis, and cataract.

**Figure 2** B-scan ultrasound of left eye showing marked posterior scleritis (crosses) and choroidal detachment (arrow).
The family did not consent to histopathological examination of the eyes.

Comment
Acute orbital inflammation and orbital myositis leading to proptosis are rare manifestations of SLE.7,8 To our knowledge acute ocular ischaemic syndrome with orbital inflammation is a novel complication of SLE. The ophthalmic manifestations may have resulted from a vasculitis involving the vessels supplying the globe and extraocular muscles. The limitation of ocular movements was most probably the result of mechanical restriction. Although the proptosis, lid and conjunctival oedema improved with immunosuppression, the visual acuity did not recover. This may have been because of irreversible visual loss from optic nerve dysfunction due to ischaemia, compression from the acute orbital inflammation, or secondary to raised intraocular pressure. Close cooperation between ophthalmologist and rheumatologist is essential in the management of these patients, in order to try and prevent blindness.

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References

Chickenpox neuroretinitis in a 9 year old child
Chickenpox in children is usually thought of as a benign infectious disease with few ocular complications. Posterior segment involvement from primary varicella zoster infection has rarely been reported in children. We describe the clinical features and visual outcome of an unusual case of neuroretinitis presenting in a 9 year old child.

Case report
An immunocompetent 9 year old boy acquired primary varicella zoster virus (VZV) infection from his sibling and developed the characteristic exanthematosus vesicular rash. Four days after the onset of the rash he woke with discomfort in his right eye and described his vision as being “all grey” on that side. He presented to the emergency department the same day and was found to have a visual acuity of 3/6 on the right and 3/3 on the left (logMAR). A relative afferent pupillary defect (RAPD) was present on the right. His anterior segment was quiet with no vitritis; however, he had slight macular thickening and a subtle cherry red spot on funduscopy, along with some mild peripapillary swelling and disc haemorrhage.

On review in the ophthalmology clinic 2 days later his vision had reduced to 1/60 (Sheridan Gardiner singles) on the right. He had no new skin lesions and all those present had crusted. No lid lesions were present. He had a marked RAPD, red desaturation, and mild conjunctival injection. His anterior segment and vitreous remained clear. The right disc was hyperaemic with peripapillary swelling and haemorrhage. The macular area was pale and oedematous (Fig 1). Examination of the left eye was completely normal.

Considering the onset of ocular symptoms and signs following the appearance of the typical VZV skin lesions, a presumptive diagnosis of chickenpox neuroretinitis was made. He was admitted and commenced on intravenous aciclovir (250 mg × 3 per day). Confirmatory IgM titres for VZV were unfortunately not performed. No change in his acuity was observed over the next few days; however, his right disc was noted to become slightly pale after 2 days of treatment. At this point intravenous methyl prednisolone was instituted at a dose of 5 mg/kg per day. Despite a gradual resolution of the macular and peripapillary oedema over the next 5 days, his disc remained pale (Fig 2) and his acuity measured as 3/30 (logMAR) after 7 days of intravenous aciclovir and 5 days of methyl prednisolone. Systemically he remained completely well and afebrile on treatment. He was discharged with a further 3 day course of oral aciclovir and a 6 day reducing course of oral prednisolone.

Over 5 months of follow up his acuity has not improved beyond 3/30 (logMAR). The right optic disc is pale and a yellow lipid deposit is present at the macula with some reticular macular pigmentation. The left eye has been normal throughout.

Comment
Posterior segment involvement as part of primary VZV infection in children has only been reported twice to our knowledge. Copenhaver1 reported a 3 year old with bilateral papillitis and a unilateral macular lesion associated with encephalitis following Varicella. This led to a complete recovery of vision and resolution of the macular lesion within 3 weeks of presentation. Capone and Meredith1 describe a case of unilateral central visual loss in a 2 year old child caused by chickenpox retinitis progressing to optic neuritis resulting in a poor visual outcome. Their patient presented with an acute exotropia 24–48 hours before the onset of cutaneous VZV. Funduscopy revealed papillitis, phlebitis, and a macular lipid deposit with intraretinal haemorrhages and scattered intraretinal haemorrhages were also described. In these two cases sequential acuity measurement or photography were not possible because of the young age of the subjects.

Our case is particularly interesting, not only because these are the first published fundal photographs of VZV neuroretinitis in a child, but also because of the relatively mild ocular findings which have resulted in severe visual loss. The young age of the patient is atypical of ocular VZV infection.1 Adults who contract primary VZV infection tend to run a more severe course than children.2 Ocular complications in children are extremely rare.3

The typical posterior segment involvement of VZV is acute retinal necrosis (ARN).4 The youngest case of ARN in association with chickenpox has been reported in a 4 year old.4 In adults, ARN is described as being less severe when presenting at the time of primary zoster infection than as a result of secondary reactivation of latent, previously acquired VZV.5 The changes typical of ARN were absent in this case. Unilateral papillitis and retinitis confined to the macular area were the main features. Optic neuritis has been reported by several authors in association with primary VZV.6–8 Many of these cases are bilateral and coincident with encephalitis1 or occurring in those who are immunocompromised.6 Unilateral optic neuritis has been described in an 18 year old several weeks following a varicella rash which remitted without sequelae following the administration of corticosteroid.9

The mainstay of treatment of VZV retinitis is with intravenous aciclovir. Whether any advantage is gained in administering systemic steroid with the aciclovir is controversial.10 We do not know if a more positive visual outcome may have been achieved if intravenous therapy had been commenced on presentation. It is therefore suggested that prompt treatment of VZV retinitis with intravenous aciclovir be started in patients, particularly in a child, presenting with any posterior segment signs.

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Figure 1 Right fundus: neuroretinitis with loss of vision to 1/60.

Figure 2 Right fundus: following treatment with intravenous aciclovir and methyl prednisolone.
A 58 year old white man presented with sudden painless loss of vision to the right eye. Vision was hand movements in the right eye and 6/6 in the left. Funduscopy revealed an acute right CRAO with macular oedema. Normal echocardiography and blood cultures excluded endocarditis. Ultrasound of his carotid arteries was normal. His vision gradually improved, and was recorded 6 days later as 6/12 in the right eye and 6/6 in the left. Patchy peripheral field defects remained.

Subsequently, his serum was positive for cryoplastic antineutrophil cytoplasmic antibody (cANCA) at a titre of 1/160, confirming the diagnosis of WG. Monthly pulses of intravenous cyclophosphamide were employed, with gradual tapering of oral prednisolone dose. There was also an incidental finding of homozygous AAT deficiency (Z allele) from serum protein electrophoresis.

**Comment**

WG is a rare disease with a reported annual incidence of 8.5 per million population in the UK, of which up to 16% present initially with ocular disease.\(^*\) CRAO in patients with WG is rare, with only several reported cases since 1960. Ocular and adnexal involvement is the result of parenchymal necrosis, small vessel vasculitis, and granulomatous inflammation. The orbit may be the site of primary inflammation or become secondarily involved from disease of the paranasal sinuses and nasopharynx. Mechanisms by which visual loss occurs in WG include vascular occlusion, macular oedema, inflammatory destruction of retina, optic nerve, or corneoscleral tissue.\(^*\)

Systemically, the most commonly affected tissues are the lungs and kidneys. The current therapy for WG is cyclophosphamide (daily or pulse) and corticosteroids. Multicentre trials are in progress to assess the optimum treatment duration for induction, and subsequent maintenance of remission.

This is the first reported case of bilateral CRAO in WG and AAT deficiency. AAT is normally present in serum and inhibits uncontrolled enzyme destruction of connective tissue during inflammation. Deficiency of AAT results in progressive emphysema and liver injury.\(^*\) Research suggests an increased incidence of WG in patients with AAT deficiency.\(^*\)

The incidence of AAT deficiency has been reported as being significantly increased in patients with anterior uveitis.\(^*\) We are not aware of any reports implicating AAT deficiency in CRAO, although it is possible that this is contributing to the ongoing inflammatory process underlying his vasculitis.

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**References**


**Complication of acupuncture in a patient with Behçet’s disease**

We would like to bring to your attention a complication resulting from acupuncture in a patient with Behçet’s disease.

**Case report**

A 35 year old white man, who fulfilled the International Study Group criteria\(^*\) for Behçet’s disease, attended the Behçet’s clinic at the Department of Rheumatology, James Cook University Hospital, Middlesbrough, UK. He complained of four red areas on his left arm during inflamed points during acupuncture in a healthy 4 year old patient. Br J Ophthalmol 2000; 84: 667–8.

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A positive pathergy test is an important diagnostic sign of Behçet’s disease. Its prevalence varies by geographic region, being less common in patients from Northern Europe. Nevertheless, patients with Behçet’s disease should be made aware of this potential complication if they intend to undergo acupuncture.

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Reference


Cornecoscleral fibrous histiocytoma

Fibrous histiocytomas of the cornecoscleral limbus are rare tumours. We present a case report and a review of the clinical and histopathological findings from cases presented in the literature.

Case report

A 19 year old white male presented with a 6 month history of a painless growth on the inferior cornecoscleral limbus of the left eye (Fig 1A and B). There were no other ocular symptoms. He had no medical history of note. His vision was 6/5 unaided in the right eye, and 6/6 unaided in the left eye. The growth was approximately 5 mm in diameter, vascularised, and yellowish in appearance. There were no other ocular abnormalities. The lesion was excised by conjunctival excision and sent for histopathological opinion.

Histological sections of the lesion showed a stromal hypercellular nodule consisting of spindle cells, small lymphocytes, multnucleated giant cells, and histiocytes. (Fig 1C–F). Some histiocytes had foamy cytoplasm. Many capillary sized blood vessels were present. In areas, the spindle cells were arranged in a storiform pattern. A fine collagenous meshwork extended throughout the lesion. Immunohistochmistry confirmed the cellular composition of the lesion (Fig 1G, H) as rich in inflammatory cells, including foam cells and siderophages. No atypical nuclei or mitotic figures are present. Although some authors regard these tumours as reactive proliferations of fibroblasts, others do not accept this view because the lesions tend not to regress spontaneously. Recurrence is rare, with less than 5% of cutaneous benign fibrous histiocytomas recurring after local excision.

In contrast, malignant fibrous histiocytomas of the cornecoscleral limbus characteristically appear in later life, between the ages of 50–70 years, with an equal distribution of males to females. They are highly aggressive tumours, and have been reported to have a local recurrence rate of 100% if a limited excision is performed. Recurrence can occur within a few months of excision. There are seven reported cases of cornecoscleral malignant fibrous histiocytoma. Two of the cases had an enucleation and two cases underwent orbital exenteration.

Figure 1 Fibrous histiocytoma arising from the cornecoscleral limbus, showing the tumour extending into the cornea. It is moderately vascular and has a similar appearance to a dermoid. (B) Fibrous histiocytoma showing the inferior margin of the tumour. (C) Haematoxylin and eosin (H&E) stain, original magnification ×2. (D) H&E stain, original magnification ×100. (E) H&E stain, original magnification ×400. (F) H&E stain, original magnification ×400. (G) Immunoperoxidase CD68. Original magnification ×200. (H) Immunoperoxidase CD45. Original magnification ×200.
Follow up of these patients ranged from 18 months to 5 years and all were free from recurrence. The other three patients had a local excision. One patient developed local scleral recurrence 2 months later. (It is not evident from the literature if the borders of excision were clear of recurrence 2 months later. He was free of any recurrence. Malignant fibrous histiocytomas need to be managed cautiously, preferably by wide local excision and cryotherapy at the earliest possible occurrence. Malignant fibrous histiocytomas include pleomorphic carcinoma, malignant melanoma, and other sarcomas. For those limbal fibrous histiocytomas with a benign histopathological appearance, the management should be local surgical excision. Malignant fibrous histiocytomas need to be managed cautiously, preferably by wide local excision and cryotherapy at the earliest opportunity. If necessary,enucleation should be considered to fully excise a limbal malignant fibrous histiocytoma.

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References

Haemophilus influenzae corneal ulcer associated with atopic keratoconjunctivitis and herpes simplex keratitis

Haemophilus influenzae is a rare cause of corneal ulceration, usually associated with previous corneal damage. To ensure appropriate treatment, the organism must first be identified by cultures in enriched media. We describe a case of keratitis caused by H influenzae associated with two risk factors—herpetic keratitis and atopic keratoconjunctivitis.

Case report
A 43 year old Hispanic male presented with 1 week of redness, blurred vision, pain, burning, and itching in the left eye. Past ocular history was remarkable for bilateral epithelial and interstitial herpetic keratitis and atopic keratoconjunctivitis with a previous shield ulcer in the left cornea. The patient was not using any medications at the onset of the current episode. He had a history of anhidrotic ectodermal dysplasia and atopic dermatitis since birth. On examination, uncorrected visual acuity was 20/100 in the left eye. The skin of the eyelids was wrinkled, thickened, and hyperpigmented bilaterally with madarosis of the lashes. The conjunctiva had a mild papillary reaction on the right, with giant papillae in the superior tarsal area. In the left eye, corneal sensation was markedly decreased and a central corneal epithelial defect of 1.0 x 0.5 mm was present with an underlying anterior stromal infiltrate measuring 2.5 x 1.5 mm (Fig 1). Scant keratic precipitates and a small hypopyon were also present.

Scrapings of the corneal ulcer were taken and inoculated on blood and chocolate agar as well as in thioglycollate broth. Viral cultures and polymerase chain reaction (PCR) were also performed to rule out the possibility of a recurrent herpes simplex infection. They were subsequently negative. The patient was started on ofloxacin and fortified cefazolin (50 mg/ml) drops every hour. He was also started on oral aciclovir 800 mg five times a day. On the fourth day, corneal cultures were positive with a heavy growth of H influenzae sensitive to ofloxacin (Fig 2). On the sixth day of treatment, uncorrected visual acuity improved to 20/30, the stromal infiltrate decreased to 1 x 1 mm, with a small epithelial defect, and there was no hypopyon. A supratarsal injection of dexamethasone was given and topical prednisolone acetate 1% three times a day was added. The papillae regressed and the corneal lesion healed completely, leaving a central scar with a deep stromal vessel.

Figure 1 Haemophilus influenzae corneal ulcer.

Comment
H influenzae is a tiny Gram negative coccobacillus that is an uncommon cause of corneal ulceration. In most series it accounts for less than 2% of all corneal ulcers. It is a common cause of acute bacterial conjunctivitis, especially in children. Unlike Staphylococcus aureus, Streptococcus pneumoniae, and other bacterial causes of conjunctivitis, H influenzae seldom produces corneal ulceration. This is in marked contrast with H pyogenes ocular infections where peripheral ulcers, infiltrates, and phlyctenules are commonly seen as complications of conjunctivitis. For H influenzae to infect the cornea, there must be an epithelial defect. Most of the reported cases of H influenzae keratitis have been associated with specific risk factors such as contact lens wear, application of cyanoacrylate glue, or systemic debilitating diseases. In this case, the patient had two significant risk factors—severe atopic keratoconjunctivitis and herpetic keratitis. Despite the negative results of the viral cultures and HSV-DNA PCR, we cannot rule out the possibility that a viral aetiology played a part in this case. Also, it seems likely that complications from the patient’s atopic disease, delayed the healing of the ulcer.

H influenzae is a fastidious organism that needs media enriched with nicotinamide adenine dinucleotide (NAD), such as chocolate agar for growth. It will not grow in blood agar, unless there are also colonies of Staphylococcus aureus, which provide NAD. In that situation, H influenzae will then grow as satellite colonies around the Staphylococcus aureus. This case illustrates the importance of utilising chocolate agar as well as blood agar to make an aetiological diagnosis.

In conclusion, H influenzae is a rare cause of corneal ulceration, which can occur in patients with previous corneal damage from...
diseases such as herpetic keratitis and atopic keratoconjunctivitis. To ensure appropriate treatment, the organism must first be identified by cultures in enriched media. C D Siverio Jr, J P Whitcher The Francis J Proctor Foundation-UCSF, San Francisco, CA 94143-0944, USA Correspondence to: Dr John P Whitcher; nepal@itsa.ucsf.edu Accepted for publication 31 October 2001

References

Blinking and operating: cognition versus vision

The difference in the refractive indices between the air and the tear film results in the tear film having the greatest optical power of any part of the eye. Eyelid blinks are important for maintenance of the tear film. Between blinks there is progressive thinning of the tear film, which becomes non-uniform on the ocular surface and may break up. This produces an irregular air/tear interface, with a reduction in image quality. The longer the period between blinks the greater the effect on the tear film and reduction in vision. Restoration of the tear film occurs immediately following a blink so that the ability to maintain a regular tear film is dependent on the blink rate. A reduction in the blink rate such as, for example, a pause between blinks of 15 seconds has been associated with a change in the shape of the profile of the corneal tear film and up to a 6% reduction in visual acuity.1 More importantly, however, a reduction in blink rate leads to a reduction in contrast visual acuity.2

The ability to distinguish between different layers during surgery, such as the posterior capsule of the lens and anterior vitreous face, or peeling of a layer of the retinal surface in vitreoretinal surgery, is dependent on the surgeon having and maintaining good contrast acuity. Blink rates and blink amplitude vary according to vision related behaviour and a reduction in the blink rate occurs with tasks of increasing visual difficulty.3 For example, visual tasks requiring concentration, such as video display terminal use, result in a decrease in average blink rate from 18.43/min to 3.6 blinks/min.4

In order to determine whether the blink rate of ophthalmic surgeons alters during intraocular surgery, the blink rate patterns of nine ophthalmic surgeons were recorded. Two observers recorded the blink rate during casual conversation and when the surgeons were using the operating microscope. None of the surgeons were aware that their blink rates were being recorded, which was done by two medical students during their ophthalmic attachment—that is, their presence in the theatre was accepted as part of their ophthalmic training. The blink rate for each surgeon was recorded in each condition between four and 10 times. The mean blink rate for each surgeon during casual conversation and while operating are presented in Table 1. There was a significant reduction in the average blink rate between both conditions (16.69/min and 4.75/min, p < 0.0001, paired t test), on average a three and a half fold decrease occurred while operating. It was also noted that the onset of such conversation as the request for an instrument or demonstration of an intraocular structure, was associated with the onset of a blink response.

The reduction in blink rates observed in this study—that is, 16.69 to 4.75, are similar to that found by Patel et al for visual tasks such as video display terminal use. A reduction in blink rate to 4.75 translates to a reduction in contrast acuity of approximately 10% with four surgeons having an expected reduction of more than 60%. Such a reduction in contrast acuity is likely to have an effect on the ability to differentiate between different intraocular surgical layers. Blinking occurs between visual fixations and may be timed so as not to interfere with significant visual input.5 Blinking is low when information memory is operating, and cognitive processes utilising display areas accessible to visual input are disrupted during the blackout period of a blink. Blinking is thus suspended during certain cognitive activities to avoid disrupting these processes.

Tear evaporation is dependent on the width of the palpebral fissure and the surrounding humidity. Evaporation increases with widening of the palpebral aperture leading to a lower tear film stability. This has led to the recommendation that video display unit screens be kept below eye level. During ophthalmic surgery the eye pieces are roughly perpendicular to the face, so that it might be reasonable to lower the height of the eye pieces to reduce the width of the palpebral aperture. Frequent instillation of artificial tears during surgery is not practicable and might also create an abnormal tear film pattern. Likewise, increasing the humidity of the theatre may not be feasible. It might be reasonable to make surgeons, and anyone who uses the microscope, aware of this potential problem so that they can train themselves to blink during parts of the operation or investigation where good contrast acuity is not essential and where disruption of the cognitive processes is likely to have a minimal effect.

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References

Should we vaccinate for glaucoma surgery? Table 1 Average blink rates [No/min] for ophthalmic surgeons during periods of casual conversation and while operating using the microscope

<table>
<thead>
<tr>
<th>Surgeon</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casual</td>
<td>17.29</td>
<td>17.75</td>
<td>7.75</td>
<td>17.60</td>
<td>27.44</td>
<td>24.67</td>
<td>11.50</td>
<td>13.86</td>
<td>12.33</td>
<td>16.69</td>
</tr>
<tr>
<td>Operating</td>
<td>9.71</td>
<td>9.00</td>
<td>0.29</td>
<td>7.40</td>
<td>1.68</td>
<td>8.67</td>
<td>1.59</td>
<td>3.86</td>
<td>0.54</td>
<td>4.75</td>
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<tr>
<td>p Value</td>
<td>0.000002</td>
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<td>0.0003</td>
<td>0.0004</td>
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</tr>
</tbody>
</table>

References
5-fluorouracil may be given. This is known as an augmented trabeculectomy.

Infective endophthalmitis is a recognised complication of glaucoma filtering surgery. It may occur in the early postoperative period or it may happen years after surgery. Another entity that probably a precursor to endophthalmitis has been described as blebitis. Blebitis is an infection of the trabeculectomy bleb without vitreous involvement.

Clinical features of blebitis include pain, photophobia, conjunctival discharge, and severe conjunctival injection centred on an opaque filtering bleb. A Siedel test may be positive (this indicates aqueous leakage from the bleb). There may be an anterior chamber reaction. There is no vitritis. As many as one per 100 patients/year may develop infection of the bleb. Factors associated with increased risk of bleb related endophthalmitis include increased axial length, thin leaky bleb, conjunctivitis, upper respiratory tract infection, hibernal occurrence, trauma, and vitreous wicks. With the increased use of antimetabolites in glaucoma surgery, the incidence of thin walled cystic blebs seems to be increasing. These blebs are more prone to leakage. Some studies conclude that presence of bleb related endophthalmitis is higher when antimetabolites are used. This is more common with inferior limbal trabeculectomy. However, some studies show equal incidence in augmented trabeculectomy and trabeculectomy without antimetabolite augmentation.

There are few data available for the incidence of blebitis. In most reported cases conjunctival swabs were performed for culture and sensitivity, but organisms causing endophthalmitis may only be present transiently on the ocular surface. In many reports, ocular surface cultures came back positive for Staphylococcus epidermidis and S aureus, which may both be found on healthy normal eyes. The microbiology of bleb associated endophthalmitis is different from other causes of endophthalmitis. Clinicians should not extrapolate the results of the Endophthalmitis Vitrectomy study to the post-filtration surgery endophthalmitis given the differing pathogenesis and unique spectrum of organisms. The most common organisms are Streptococci species. The second most common is Haemophilus influenzae type b at over 23% of the Streptococci, S pneumoniae may account for approximately 12%. Between them H influenzae type b and S pneumoniae probably cause more than 35% of blebitis and bleb associated endophthalmitis.

The treatment of endophthalmitis is expensive. It usually involves admission of the patient and frequent use of expensive drops as well as surgical intervention. Inpatient treatment for blebitis has been priced at US$892 (approximately £540) per 24 hours. This can work out to more than £3000 for a 10 day stay in hospital. Furthermore, the cost of follow up visits and the morbidity that is involved need to be taken into account. Frequently these patients have pre-existing visual compromise and an episode of endophthalmitis may result in further visual or blindness registration, an individual disaster with wider social implications.

H influenzae type b vaccine is licensed for use in infants. However, its use is allowed in those patients considered to be at risk for invasive H influenzae type b disease such as sickle cell disease and those receiving treatment for malignancy. After the age of 13 months the vaccine is effective after a single dose. This vaccine has already shown benefit in ophthalmology by the dramatic decrease in the incidence of orbital cellulitis in immunised children. It consists of a capsular polysaccharide of H influenzae type b conjugated to a protein carrier. Side effects of the vaccine include fever, headache, malaise, irritability, loss of appetite, vomiting, diarrhea, rash, urticaria, convulsions, erythema multiforme, and transient cyanosis of the lower limbs. Its cost to the NHS is as low as £8.83 for a single dose of 0.5 ml.

Pneumococcal vaccine is available. It is a polyvalent pneumococcal polysaccharide from each of 23 capsular types of S pneumoniae. The vaccine is recommended from the age of 2 for children with specific conditions: homozygous sickle cell disease, asplenia or dysfuncion of the spleen, chronic renal disease, nephrotic syndrome, immunodeficiency, immuno-suppression, chronic heart disease, chronic lung disease, chronic liver disease, and diabetes mellitus. It is effective after a single dose if the strains of S pneumoniae prevalent in the community are reflected in the poly-saccharides contained in the vaccine. Its cost to the NHS is as low as 0.5 ml vial. There have been no reports of epidemics of infective blebitis. If it was contagious, there would have been epidemics or clustering in our glaucoma clinics. We can find no evidence of case to case transmission. In fact, all reported cases and series appear sporadic. The association with upper respiratory tract infection and hibernal occurrence are strongly suggestive of respiratory infection with consequent spread to the predisposed eye. We are uncertain whether this is systemic or droplet spread. However, the need for topical antibody protection is negated by the presence of systemic antibodies specific to these bacteria. We believe that by minimising the possibility of systemic infections with these agents we diminish the likelihood of blebitis. It is possible that these vaccines could be given to patients who are destined for trabeculectomy. The cost for both vaccines would be less than £20.00. Two hundred and fifty vaccinations could be paid for by the price of a single episode of bleb associated endophthalmitis. Assuming a long term infection rate of 2%, these vaccines could possibly prevent two cases of bleb associated endophthalmitis, representing a saving of £5000 to the NHS. Apart from the cost, vaccination has the potential to prevent significant ocular morbidity. At the very least, these vaccines should be considered in high risk patients undergoing augmented trabeculectomy. We plan to conduct a prospective study of the effect of these vaccinations upon the incidence of blebitis and bleb related endophthalmitis.

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The wide field multifocal electroretinogram reveals retinal dysfunction in early retinitis pigmentosa

The diagnosis of retinitis pigmentosa (RP) is based on the nature of characteristic retinal pigment changes, visual field defects, and reduction in amplitude or loss of rod scotopic standard electroretinography (ERG) responses, with a possible history of night blindness and a positive family history of RP. Multifocal electrophysiology (mERG), is a new technique that constructs a topographical map of retinal function. Recent reports have suggested that the spatial resolution of mERG is sufficient to detect focal changes in retinal function as RP progresses.

We describe a case of early RP in which the amplitude and implicit times of the patient’s standard ERG rod and maximal responses were normal in the right eye and equivocal in the left eye. However, the peripheral retinal mERG amplitude and implicit times were reduced and delayed. These abnormalities were obtained using a custom built wide field mERG, which facilitates assessment of a 90 degree retinal field.

Case report

A 29 year old woman was referred to the eye clinic by her optometrist. Abnormal retinal pigment changes were found in both funds on routine examination. She had no visual problems and was otherwise systemically well. Her 51 year old mother is known to have RP.

On examination, she had 0.5 dioptres of hypermetropia in both eyes. Her best corrected logMAR visual acuities were −0.075 in the right eye and −0.025 in the left. Her colour vision, anterior segment examination, and intraocular pressures were normal in both eyes. Fundal examination revealed semicircular arcs of intraretinal “bone spicule” pigmentation in the inferior mid- periphery of each retina. Her optic discs appeared normal and there was no evidence of attenuation of the retinal vasculature.

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A Humphrey 120 point threshold related perimetry test was performed and the patient maintained fixation throughout the test. There was an arc of absolute visual field defect in the superior field, symmetrical in both eyes, 40 degrees from fixation, which was more extensive superotemporally than superonasally.

A Ganzfeld ERG test was performed in accordance with international standards. The implicit times and amplitude of the scotopic rod, photopic cone and flicker responses of the patient were normal. The scotopic maximal b-wave amplitude was reduced by 14% in the left eye and was normal in the right eye (Fig 1).

Wide field mFERG was performed, using a technique previously described. The amplitudes of the central and peripheral mFERG responses were grouped and averaged (Fig 2A) and compared with similar responses from normative data (Fig 2B). The average amplitude of the central mFERG response was 75 nV in the right and 101 nV in the left (normal range 74–122 nV) (Fig 2A). The average peripheral retinal mFERG responses were 29 nV in the right eye and 45 nV in the left eye (normal range 61–108 nV). The normal range is derived from a group of 40 controls, aged 20–40 years. In addition, the mFERG responses were reduced in areas that had normal visual field sensitivities.

Comment
Retinitis pigmentosa in its early stages of evolution is characterised by rod dominated photoreceptor dysfunction. Although mFERG is a photopic response, thought to predominantly reflect cone function, the nature of mFERG stimulation (that is, stimulation frequencies from 5 Hz to 75 Hz), indicates that this composite response may contain contributions from rods, in addition to cones and post receptor cells.

The global nature of the Ganzfeld ERG requires approximately 30% of the retina to be dysfunctional before abnormalities can be detected. In this case report, the standard ERG did not help to confirm the diagnosis of RP. However, the spatial resolution of the peripheral wide field mFERG indicated peripheral retinal dysfunction, suggestive of RP.

We conclude that wide field mFERG may have advantages over Ganzfeld ERG in the electrophysiological diagnosis of some forms of early RP. Further evaluation of wide field mFERG in the diagnosis and follow up of early RP is indicated.

References

Day 1 review following cataract surgery: are we seeing the precise details?

The Royal College of Ophthalmologists published cataract surgery guidelines in February 2001. This document includes protocols relating to postoperative visits suggesting that there are no additional risks to patients who are not reviewed on the first postoperative day. This is a change in recommendation from previous college guidelines in 1995 suggesting a review within 48 hours.

There may follow a growing impetus for ophthalmologists to dispense with the first day review, given the reduced demand on clinician time and the corresponding accrual of staffing and financial resource benefits. While we applaud the dissemination of practice guidelines, they constitute “merely tools, not rules” to aid clinical decision making. They may have inherent limitations in particular circumstances and may require evaluation for effective application in clinical settings.

Four studies were quoted by the guideline authors, three of which advocated the omission of day after review and one of which was equivocal, suggesting that it was unsafe to abandon this practice unless raised intraocular pressures (IOP) were controlled. The numbers of patients included ranged from 100 to 387. The results of these studies are shown in Table 1.

Comment
In our view, deriving meaningful conclusions that may underpin clinical practice are difficult, owing to the varying methodological...
Cohen the predominant surgical technique used. In Tufail's study, approaches used in these studies. In Tufail’s 482 PostScript the National Cataract Surgery Survey align more closely with our “gold standard” of eyes, of which 88% was raised IOP. Unlike the previous mentioned studies, all patients with available records were eligible, including those with preoperative risk factors and those with surgical complications. These figures align more closely with our “gold standard” of the National Cataract Surgery Survey than the previous mentioned studies. The events most frequently occurring within 48 hours after cataract surgery in the national survey were corneal oedema (9.5%), raised IOP (7.9%), and uveitis (5.6%). Overall, 23.3% of patients had early postoperative complications ranging from minor to sight threatening conditions. The survey also found that several risk indicators were associated with poorer visual outcomes and complications related to cataract surgery: age, ocular co-morbidity (glaucoma, macular disease, amblyopia, and previous ocular surgery), diabetes mellitus, stroke, type of surgical procedure, and grade of surgeon. In summary, up to 20 000 patients a year in the United Kingdom (10%) may have an unexpected early postoperative complication such as corneal oedema or raised IOP if first day review was abandoned. And if McKellar’s study is representative, then 5% of patients would have raised pressure without any previous history or surgical complication and 0.9% of patients could have other potentially serious early complications. Nationally, that equates to almost 12 000 patients annually. It is worth noting that the American Academy of Ophthalmology in its white paper, concludes that there are enough significant early postoperative complications to warrant first day review. Are we sufficiently confident in our own practices to diverge?

Credit should be apportioned to the distinguished authors of the cataract surgery guidelines suggesting 24 hour follow up of patients who had undergone complicated surgery, had coexisting eye disease, or had large incision cataract surgery. We would like to reiterate the importance of explicit criteria as part of any review policies and suggest that clinical interpretation of individual circumstances is paramount.

To reconcile the need for an efficient, cost effective review protocol together with a necessity to give due consideration to the entirety of detrimental post-cataract complications, especially given the NHS resource constraints, is difficult. A pragmatic approach may be for clinicians to be discriminatingly aware of those patients most at risk of developing early complications and instituting review policies accordingly, together with an open door policy for patients who need or want reassurance on the first day following uncomplicated surgery. Furthermore, a multi-professional management approach involving the extended role of trained ophthalmic nurses in postoperative care may reduce demands on physician time.

At the moment, there is a paucity of a good prospective literature on the subject and a need for future studies to address whether those identified complications would result in a change of management at the first postoperative day visit and whether patients would have a poorer outcome if the changes were not instituted.

References
They also reported that bright patchy choroidal regions should be a new diagnostic criterion for neurofibromatosis type 1. The non-invasive SLO examination with confocal and indirect infrared imaging may be useful in the diagnosis of patients with neurofibromatosis type 1.

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Corneal melt and perforation secondary to floppy eyelid syndrome in the presence of rheumatoid arthritis

Floppy eyelid syndrome (FES) is an uncommon condition that is often underdiagnosed or misdiagnosed owing to the somewhat trivial and non-specific symptoms with which it often presents. In association with the dry eye of rheumatoid arthritis it can, however, have devastating effects.

Case report

A 60-year-old moderately obese man with well controlled rheumatoid arthritis (RA) presented to the eye clinic with recurrent red and gritty eyes. A diagnosis of dry eye syndrome with blepharitis was made. He was also found to have a mucocele of the left lacrimal sac. Lid hygiene and ocular lubricants yielded an initial encouraging response and he was discharged. He re-presented 5 years later with similar symptoms and reduced visual acuity (VA) of 6/36 in the left eye. A diagnosis of dry eye syndrome with secondary corneal epithelial changes was made. Topical lubricants failed to relieve the condition satisfactorily and he was therefore scheduled for punctal occlusion. However, upon admission for this 8 weeks later he was found to have an asymptomatic perforation of the left cornea, with a VA of 6/60. The perforation was treated with glue and a bandage contact lens, topical antibiotic, steroids, and lubricants. Systemic immunosuppression was considered in view of the history of RA, but was withheld as a heavy growth of staphylococcus had been cultured from the cornea. The right eye demonstrated signs of dryness but was otherwise healthy with VA of 6/9.

Bilateral punctal occlusion was undertaken as planned, and in addition a left dacrocystorhinostomy (DCR) to eliminate the mucocele as a potential reservoir of infection. The eye, however, continued to slowly deteriorate, with persisting mucopurulent discharge, despite the DCR. Eventually uncontrolled endophthalmitis developed requiring enucleation.

He re-presented 8 months later with reduced VA of 6/60 in the right eye secondary to a corneal melt (Fig 1A). A chronic mucopurulent discharge had also developed in the right eye, but no lacrimal sac mucocele was identifiable. On this occasion, however, it was noted on examination that while everting the eyelids, all four lids exhibited excessive laxity (Fig 1B). This, together with a florid papillary tarsal conjunctival reaction and the chronic mucus discharge, led to a diagnosis of RA associated dry eye syndrome exacerbated by FES.

All four eyelids were immediately subjected to considerable shortening by pentagonal excision; the corneal melt was treated with a bandage contact lens, with topical antibiotic, steroids and lubricants. The response to surgery was dramatic with complete resolution of discharge and gradual spontaneous repair of the corneal melt (Fig 2). The VA eventually recovered to 6/9.

Comment

FES occurs most frequently in middle aged obese males, although it has been described in young, slim males, females, and one child. Typically, the upper tarsus is rubbery and the upper eyelid everts easily with gentle upward pressure. A florid papillary conjunctivitis and chronic mucus discharge are common. Severe corneal involvement is rare, with only four reports in the literature of ulcerative keratitis in association with FES and only two cases of perforation. Although the exact pathophysiology of FES is uncertain, a sequence of events may lead to its development and to the secondary corneal changes has been proposed. Unidentified predisposing factors, possibly congenital, create a floppy upper tarsus. Whereas examination of post-mortem specimens has revealed normal tarsal collagen, elastin fibres are nearly absent. It is unclear whether this finding is causative or secondary. During sleep, a local pressure induced ischaemia may develop in the tarsus that, when relieved, results in a reperfusion injury which could injure tarsal elastin. In addition, there is a high incidence of obstructive sleep apnoea in FES patients and nocturnal dips in PaO2 could further contribute to the local ischaemia and resultant elastin damage.

Corneal involvement may occur through one or more mechanisms. Spontaneous nocturnal lid eversion resulting from pressure of the pillow on the lax upper lid may lead to repeated trauma of the corneal epithelium. Lash ptosis may contribute to this direct trauma. The cornea, however, may be damaged from a more subtle but important mechanism. Affected lid specimens demonstrate a marked polymorphonuclear infiltrate, which may be the sequela of the reperfusion injury described above; this tarsal infiltrate and the associated papillary response may have direct toxic effects on corneal epithelium and stroma. It is perhaps intuitive that the corneal complications found in FES may be more severe when, as in our case, co-existing pathologies are present. Blepharitis and RA associated dry eye may both independently cause significant corneal pathology.

This case serves as a reminder that multiple pathologies may contribute to the clinical picture. If FES is not to be missed, ocular examination must include lid eversion and inspection of the tarsus.

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Ocular trauma with small framed spectacles

Penetrating injuries are widely reported with spectacle related eye trauma, particularly in car accidents. The use of high grade plastics and secure frames have been shown to reduce the incidence of spectacle related eye trauma. Spectacle safety may be compromised in the trend for small frames and frameless spectacles and may place patients at risk of serious ocular injury.

We present the case of an aphakic patient who sustained a blunt injury following ocular compression by her spectacles. Her injuries could have been avoided if larger framed spectacles had been worn.

Case report

A 79 year old aphakic woman sustained a non-penetrating injury to her left globe by walking into a door. She noted a sharp pain and sudden loss of vision. The globe was compressed by her spectacles, which were smaller than her orbital rim. Her glasses were not damaged and there was minimal periocular soft tissue injury.

She was aphakic, following bilateral cataract extraction for congenital cataracts. The spectacle refraction was +9.00 with a short back vertex distance of 5 mm (Fig 1).

The pinhole acuity was 6/36, a quiet, deep anterior chamber was noted with no aqueous leak, the intraocular pressure was 0 mm Hg. Funduscopy revealed a light vitreous haemorrhage, peripapillary choroidal ruptures, and a 360 degree suprachoroidal haemorrhage (Fig 2).

Hypotony following traumatic ciliary artery spasm was diagnosed and the patient was treated conservatively, with topical atropine twice daily and dexamethasone four times daily. After 4 days the hypotony resolved and the intraocular pressure returned to 14 mm Hg. The suprachoroidal haemorrhages resolved over 2 weeks and the visual acuity improved to 6/24.

Comment

The potential ocular damage from framed and frameless spectacles has been highlighted in a number of reports. These often result from minor road traffic collisions or inflation of air bags that damage the spectacles. The trauma is usually sufficient to break the lenses in the spectacle and the resultant globe laceration is the main cause of morbidity.

The recent trends towards smaller framed spectacles has not been reported as a potential risk to the patient; however, in this case, with small framed spectacles (with a short back vertex distance), minor trauma was sufficient to cause serious eye injury. The patient’s previous larger framed spectacles would have prevented such an injury as the lenses would have been supported by the orbital margin and not the globe.

This case demonstrates the previously unconsidered risk of small framed spectacles in aphakic patients. The back vertex distance may be short, increasing the risk of blunt injury.

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Late opacification of SC60B-OUV acrylic intraocular lenses

Optical clarity of the intraocular lens (IOL) is paramount in maintaining visual improvement after cataract extraction. While the advent of newer foldable IOLs has revolutionised cataract surgery by the smaller incisions required, their long term safety has been established only with time. There have been recent reports of two separate groups of hydrophilic IOLs that have shown various degrees of opacification, 6 months to 2 years after implantation. These include the Hydroview lens (Bausch & Lomb Surgical, Claremont, CA, USA) and the model SC60B-OUV (Medical Developmental Research, Clearwater, FL, USA). We report our experiences with two patients who had permanent reduction in visual acuity 1–2 years after implantation of the SC60B-OUV IOL.

Case reports

Case 1

An 82 year old man with visual acuities of 6/60 in both eyes because of a right macular hole and left posterior subcapsular cataract underwent routine left phacoemulsification and intraocular lens implantation in March 1998. A foldable hydrophilic acrylic IOL (Model SC60B-OUV, MDR, Inc) was implanted in the capsular bag. Postoperative recovery was uneventful, with left visual acuity improving to 6/4 with correction, 6 weeks after the surgery.

He was referred back to the clinic in March 2000 with symptoms of intermittent binocular diplopia, which was relieved with Fresnel prisms. His left visual acuity was 6/6, but the intraocular lens was found to be uniformly cloudy (Fig 1A). At the patient was not experiencing any symptoms from this cloudy IOL, no intervention was advised. Over the next 6 months the brownish discoloration of the IOL increased in intensity and the patient complained of “foggy vision.” His visual acuity dropped to 6/12 and he was disturbed by the distorted, but clear images from his right eye and hazy images from his left eye. Fundus examination of the left eye has also become progressively difficult. IOL exchange is being considered, bearing in mind the presence of the macular hole in the fellow eye and the risks of removing a posterior chamber IOL 3 years after implantation.

Case 2

A 78 year old woman with bilateral Fuchs’ endothelial dystrophy and long standing central retinal vein occlusion in the left eye, underwent uneventful right phacoemulsification with intraocular lens implantation (Model SC60B-OUV, MDR, Inc) in August 1998. Her right visual acuity improved to 6/9,
but approximately 1 year after the surgery there was gradual deterioration of vision to 6/24 in August 2000. At this stage the IOL was noted to be cloudy; there was also progression of her endothelial dystrophy. She underwent uneventful right penetrating keratoplasty with exchange of posterior chamber IOL in November 2000 and has a current right visual acuity of 6/12. The explanted opacified IOL is compared to a normal clear acrylic IOL in Fig. 1B.

Comment

The safety and efficacy of AcrySof polyacrylic IOLS has been reported to be equal to or better than polymethylmethacrylate IOLs. The unexpected late opacification of the acrylic IOL (SC60B-OUV), implanted in the only “good” eye of both our patients, resulted in significant visual disability and clinical dilemma. This model of IOL was first produced in June 1997 by Medical Development Research (MDR, Inc). More than 60,000 of these lenses have been implanted worldwide, but only outside the United States.1 Reports of opacification of the IOL started coming through to the manufacturer in May 1999. (Summary of SC60B-OUV lens opacification investigation, personal communication from MDR, Inc, 20 July 2001).

Several theories have been put forward to explain the late clouding of the IOL optic.1–4 Analysis of 23 explanted IOLs of the same model has shown that degeneration of the ultra violet filtration material and calcium deposits within the optic biomaterial are responsible for the opacification of the IOL.5 Werner et al6 analysed nine explanted IOLs of the same model and demonstrated the presence of calcium phosphate salts in the deposits within the optic of the IOL.7 Investigations by the manufacturers identified four lots of polymer biomaterial formulated and prepared by Vista Optics (London) and used by MDR, Inc in the IOL manufacture, that correlated with opacification complaints (Summary of SC60B-OUV lens opacification investigation, personal communication from MDR, Inc, 20 July 2001).

Ninety two of the estimated 60,000 SC60B-OUV IOLs implanted were explanted and returned to the company, MDR, Inc ceased exporting SC60B-OUV lenses in June 2000 and claims that the opacification represents only 0.15% of total SC60B-OUV IOLs implanted. (Summary of SC60B-OUV lens opacification investigation, personal communication from MDR, Inc, 20 July 2001). However, this does not account for those patients who have not yet had their opaque IOLs identified or explanted. The lateness of the onset of opacification and resulting visual disability may mean that we are seeing only the tip of the iceberg.
impair the normal turnover of bulbar conjunctival epithelial cells. This may be aggravated, in some patients, by blepharospasm, which increases the force on the globe.  

Therapeutic lenses can produce rapid symptom relief in SLK. They may be helpful in the treatment of SLK as they relieve pain and facilitate healing of punctate epithelial erosions by protecting the ocular surface from the eyelids, reduce upper lid pressure on the globe and correct tear dynamics. During blinking as the upper lid moves downwards to meet the lower lid significant forces are exerted on the globe. The lens can reduce the force on the superior limbus from blinking as it has a lower mechanical stiffness and elastic modulus.  

In the first week of contact lens wear tear production increases dramatically and tear tonicity decreases. Tear production then normalises and tear tonicity rises as evaporation increases. A lens may then aid aqueous tear deficiency, which can accompany SLK, by ensuring a continuous preocular tear film. It is certain of the mechanism of bilateral symptom relief from unilateral keratitis and corneal vascularisation. The duration of lens wear, would then facilitate healing of punctate epithelial erosions.

One possible explanation is that the reduced upper lid pressure on the globe, and alteration of tear dynamics, increases tear production increases dramatically and tear tonicity rises as evaporation increases. In the first week of contact lens wear tear production increases dramatically and tear tonicity decreases. Tear production then normalises and tear tonicity rises as evaporation increases. A lens may then aid aqueous tear deficiency, which can accompany SLK, by ensuring a continuous preocular tear film. It is certain of the mechanism of bilateral symptom relief from unilateral keratitis and corneal vascularisation. The duration of lens wear, would then facilitate healing of punctate epithelial erosions.

Bilateral symptom relief from unilateral SLK. One possible explanation is that the reduced upper lid pressure on the globe, and alteration of tear dynamics, increases tear production increases dramatically. This may be aggra

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MAILBOX

Keratectasia after PTK

Takahashi and colleagues have elegantly described an interesting and rare complication of phototherapeutic keratectomy (PTK) in their recent report of an unusual case of keratectasia after PTK. The hypothesis that the risk of ectasia is proportional to residual stromal base, or depth of ablation, fits with the assumed biomechanical aetiology of this recently reported complication of laser refractive surgery. The generally accepted empirical minimum thickness of 250–300 µm of corneal stroma, excluding flap thickness, remains speculative, as we do not understand the underlying pathophysiology. Indeed, although Holland et al. highlighted the association of thin residual stromal thicknesses, post-PRK and LASIK, with keratectasia, they also described this complication after surface based hyperopic PRK ablation, where the centre was minimally ablated and residual stromal thickness was greater than 360 µm.  

The authors suggest, in the reported case, that band-shaped keratopathy (BSK) may have compressed the tensile strength of the cornea. This seems unlikely as this condition generally affects the superficial anterior cornea, and usually does not penetrate deeper than Bowman’s layer.  

However, there are a number of reasons, other than simple biomechanical compromise, for keratectasia following PTK in this case: (1) forme fruste keratoconus—as no preoperative topography or surface asymmetry values are presented to enable the reader to rule this out; (2) clinical keratoconus, which seems less likely in respect of patient’s age and a preoperative cylindrical error of only −1.5D; (3) idiopathic keratectasia, possibly secondary to widespread deregulated keratocyte apoptosis. The latter has been demonstrated after LASIK, with a considerable and longstanding decrease in keratocytes in the peri-ablation area. Also, Helena et al demonstrated apoptosis to a depth of at least 50 µm after all of the following procedures: epithelial scrape, corneal scrape PRK, transepithelial PRK and LASIK. Epithelial scrape and LASIK demonstrated keratocyte apoptosis to depths of up to 75 µm and 100 µm, respectively. The authors have recently identified a keratocyte free zone 160 µm into the stroma following LASIK, and theoretically more widespread apoptosis is a response to excimer laser photorefractive surgery, which may contribute to keratectasia.

While it is difficult to ascertain why keratectasia occurs, in this case with a residual stromal thickness of over 500 µm, from the data provided the most likely aetiologies would seem to be either undiagnosed forme fruste keratoconus or idiopathic keratectasia. Currently, recent reviews illustrate the dearth of substantial information available regarding idiopathic keratectasia (iatrogenic keratocomus), with a little over 60 cases published. At this point, although some are likely to be due to over-ablation, for many cases such as this the exact aetiology remains unknown and is likely to be multifactorial, and one of these factors is residual corneal thickness. The fact that keratectasia can occur, after what would be considered minimal ablation, highlights the unpredictability of occurrence, but with over a million cases of LASIK or PRK occurring each year, the stimulus to identify contributing factors is significant.

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References


BOOK REVIEWS

Age Related Macular Degeneration—Current Treatment Concepts.


This book is one in a large series of medical radiology textbooks concentrating on diagnostic imaging and radiation oncology. There are 71 authors in all, the majority of whom work either in the eastern United States or Germany, and the book contains 24 chapters. The text is aimed at specialists in radiotherapy rather than ophthalmology. The majority of the chapters are concerned with radiotherapy of age related macular degeneration (ARMD) with contributions from experts in this field. Some of the chapters contain results of controlled studies and are of good value, whereas others have less scientific merit and that they are long term follow up studies without controls. For ophthalmologists wishing to look into the subject of...
radiotherapy for ARMD this would be a good source of material and is well referenced.

There are a few chapters on the clinical manifestations, diagnosis, and surgery of ARMD but there is no real mention of laser treatment. Many of these chapters are of limited scope and do not provide a comprehensive overview of the ophthalmic assessment and management of ARMD.

Although not stated in the book it reads as if it is the proceedings of a clinical meeting. The chapters do not read in a coordinated way and essentially present the results of individual units describing their methods and results of radiotherapy. As such it is a useful source of information for those with an interest in this topic but it is of limited value for ophthalmologists wishing to obtain a balanced view of current treatment of ARMD.

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Clinical Ophthalmic Pathology.
John Harry, Gary Misson. Pp 376; £125.

This is an excellent, easy to read, well illustrated book. It is one of the first of its kind to bring pathology alive by describing diseases via pathogenesis as opposed to anatomy. For the trainee in ophthalmology, optometry, and visual science it, therefore, provides a more logical approach to the understanding of ocular diseases. As the book attempts to cover many subjects it sometimes does not do justice to each. It would have been better to have had the reading lists at the end of each chapter. However, as it stands the book is an excellent introduction to pathology complementing clinical textbooks. If read together with clinical texts it certainly will broaden the knowledge base of all trainee ophthalmologists. As a result of its logical and simple approach I was left frustrated at times with the lack of background knowledge. However, going through pathologically based chapters including injury and repair, immunity, genetics, growth, degeneration, vascular disorders, and disorders of the nerve and muscle, I was left entertained, as a clinician, with a greater understanding of pathological processes.

The final chapter for the clinician in the laboratory I felt could have been expanded, delivering more detail, particularly, on the current molecular methods used in pathological practice today.

A Dick

NOTICES

Childhood blindness
The latest issue of Community Eye Health (No 40) discusses new issues in childhood blindness, with an editorial by Clare Gilbert, senior lecturer at the International Centre for Eye Health. For further information please contact: Journal of Community Eye Health, International Centre for Eye Health, Institute of Ophthalmology, 11–43 Bath Street, London EC1V 9EL UK (tel: +44 (0)20 7608 6910; fax: +44 (0)20 7250 3207; email: eyesrc@ucl.ac.uk; website: www.jceh.co.uk). Annual subscription (4 issues) UK£23/US$40. Free to workers in developing countries.

International Centre for Eye Health
The International Centre for Eye Health has published a new edition of the Standard List of Medicines, Equipment, Instruments and Optical Supplies (2001) for eye care services in developing countries. It is compiled by the Task Force of the International Agency for the Prevention of Blindness. Further details: Sue Stevens, International Centre for Eye Health, 11–43 Bath Street, London EC1V 9EL UK (tel: +44 (0)20 7608 6910; email: eyesrc@ucl.ac.uk).

Second Sight
Second Sight, a UK based charity whose aims are to eliminate the backlog of cataract blind in India by the year 2020 and to establish strong links between Indian and British ophthalmologists, is regularly sending volunteer surgeons to India. Details can be found at the charity website (www.secondsight.org.uk) or by contacting Dr Lucy Mathen (lucymathen@yahoo.com).

Specific Eye ConditionS (SPECS)
Secific Eye ConditionS (SPECS) is a not for profit organisation which acts as an umbrella organisation for support groups of any conditions or syndrome with an integral eye disorder. SPECS represents over fifty different organisations related to eye disorders ranging from conditions that are relatively common to very rare syndromes. We also include groups who offer support of a more general nature to visually impaired and blind people. Support groups meet regularly in the Boardroom at Moorfields Eye Hospital to offer support to each other, share experiences and explore new ways of working together. The web site www.eyeconditions.org.uk acts as a portal giving direct access to support groups own sites. The SPECS web page is a valuable resource for professionals and may also be of interest to people with a visual impairment or who are blind. For further details about SPECS contact: Kay Parkinson, SPECS Development Officer (tel: +44 (0)1803 524238; email: k@eyeconditions.org.uk; www.eyeconditions.org.uk).

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CORRECTION
The authors of the letter “Recurrent corneal ulceration as late complication of toxic keratits”, appearing in the February issue of BJO (2002; 86: 245–6), would like to add an author, SH Santaner.