Laser induced chorioternal venous anastomosis in ischaemic central retinal vein occlusion

Laser induced chorioternal venous anastomosis (CRVO) has been advocated by McAllister and Constable as a treatment for non-ischaemic central retinal vein occlusion (CRVO). This technique potentially offers a means of permanently bypassing the site of obstruction to venous outflow, which is thought to occur in the region of the lamina cribrosa. In ischaemic CRVO, the visual prognosis is usually much poorer, with devastating complications like neovascular glaucoma and progressive macular ischaemia. In this prospective study, we investigated the feasibility of laser induced CRVA in eyes with ischaemic CRVO, in view of the possibility of avoiding or lessening these severe complications.

Materials and methods

The classification of ischaemic CRVO was based on the presence of 10 disc diameter or more of capillary non-perfusion in the fundus based on the presence of 10 disc diameter or more of capillary non-perfusion in the fundus fluorescein angiography (FFA), according to Moreira and Constable as a treatment for venous thrombosis (CRVO) has been advocated by Laser induced chorioretinal venous anastomosis (CRVA) has been advocated by McAllister and Constable as a treatment for non-ischaemic central retinal vein occlusion (CRVO). This technique potentially offers a means of permanently bypassing the site of obstruction to venous outflow, which is thought to occur in the region of the lamina cribrosa. In ischaemic CRVO, the visual prognosis is usually much poorer, with devastating complications like neovascular glaucoma and progressive macular ischaemia. In this prospective study, we investigated the feasibility of laser induced CRVA in eyes with ischaemic CRVO, in view of the possibility of avoiding or lessening these severe complications.

Results

Six eyes of six patients were included (Table 2). All of them had posterior vitreous detachment. Median follow up was 21 months (range 5–31 months). The median preoperative best corrected visual acuity (BCVA) was 2/200 (range, hand movement to 8/200). The median postoperative best corrected visual acuity (BCVA) was 2/200 (range, hand movement to 20/200). The median number of attempted anastomosis sites per eye was four (range, two to four). Through repeated ophthalmoscopic examination, FFA, and indocyanine green angiography, no functional anastomosis was found. A small nodular fibrotic scar was noted in each site (Fig 1B). No other significant laser related complication was found. One eye eventually developed subretinal haemorrhage around the retinal vein (Fig 1A). The bleeding was stopped by pressure on the eye with a contact lens.

Comment

In non-ischaemic CRVO, a successful CRVA was created in 33–54% of eyes. Laser photocoagulation treatment parameters differed, because the superiority of one combination of parameters compared with another had not been demonstrated. In our study, it appears that argon or diode laser induced CRVA was not feasible in ischaemic CRVO. We attribute this to the severe endothelial cell damage secondary to ischaemia and venous thrombosis across the retinal circulation. In a dog model without retinal vein occlusion, a successful laser induced CRVA was shown to be lined by endothelial cells. Despite the failure to create functional CRVA, we did not encounter any adverse complication related to the laser treatment. The presence of posterior vitreous detachment in our patients might have lessened the chance of development of chorioretinovitreal neovascularisation. Successful CRVA in ischaemic CRVO has been reported to be established through pars plana vitrectomy with direct surgical puncture or erbium:YAG laser. This surgical approach may be a better option to create CRVA in ischaemic eyes, especially when the posterior hyaloid is still attached preoperatively.
Actinic granuloma is a condition characterised, histologically, by a preponderance of elastic fibres and the absence of necrobiosis, induced, histologically, by a preponderance of degenerate elastic fibres. This phenomenon of repair occurring in damaged connective tissue. This concept was disputed by Ragaz and Ackerman who believed that the granulomatous inflammation was not a response to degenerative elastic fibres but granulomatous features suggestive of actinic granuloma (Fig 2).

Investigations into the cause of the underlying focal scleral atrophy included full blood count, erythrocyte sedimentation rate, serum VDRL, serum complement, anti-roy and anti-la antibodies, and rheumatoid factor which were all within normal limits. A screening serum ANCA was weakly positive (1:20) but anti-myeloperoxidase assays were negative.

Anterior segment ultrasonography was normal. Fluorescein angiography of the anterior segment demonstrated an evenly perfused iris, but a filling defect clearly delineated the atrophy and thinning at the lesion site. Our patient was subsequently treated with topical antibiotics and eye padding and responded favourably over several weeks with progressive epithelialisation over the excision defect (Fig 3). The scleral changes persisted after resolution of the epithelial defect (Fig 3, arrowhead).

Comment

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that the lesions described by O’Brien represented variants of granuloma annulare, a disorder of skin and ocular adnexae.\(^1\) The existence of conjunctival actinic granulomas in isolation distinguishes this condition from granuloma annulare and implies that granuloma formation can occur in response to elastotic material. Furthermore, actinic granulomas are histologically distinct with prominent elastotic degeneration of connective tissue fibres, giant cells, and incoherent palisading of epithelioid histiocytes.

McGrae postulated that actinic granuloma represented a cell mediated immune response to weakly antigenic determinants on actinic-heat-damaged (elastotic) skin.\(^1\) It is hypothesised that actinic radiation selectively injures elastic tissue in the skin and its superficial arteries and this tissue may then become antigenic, with local, humoral, and systemic overtones.

It is reported that the serum of patients with untreated giant cell arteritis contains a significantly elevated level of an elastase in the form of matrix metalloproteinase 9 (MMP-9) and that this enzyme was found to be abundant in the vicinity of damaged temporal internal elastic laminae.\(^1\) Gillot et al.\(^2\) observed that sera from 12 of 13 patients with untreated giant cell arteritis contained high levels of elastase derived elastin peptides and that the peptides were targeted by T lymphocytes such as appear in the actual lesions of actinic granuloma and giant cell arteritis.\(^2\) This mode of autoimmune reaction complies with the “danger” model of autoimmunity described by Matzinger and appraised by Larkin.\(^2\) Our case presented with the novel association of an underlying focal scleral atrophy. Negative investigations for scleritis would suggest that this feature may be an extension of the autoimmune process representative of actinic granuloma rather than an independent idiopathic scleritis.

It is interesting to note that all documented cases of actinic granuloma of the conjunctiva have occurred in females which would be supportive of an autoimmune pathogenesis. Clinically, the differential diagnosis of conjunctival actinic granulomas includes pingueculitis, Bowen’s disease, conjunctival naevus, granulomatous reaction to parasitic and fungal lesions there is often a prominent eosinophilic infiltrate associated with the granulomas. Caseous necrosis is seen in mycobacterial infections. In difficult cases special stains may help. Polarised light microscopy rules out the presence of any birefringent material. Actinic granuloma of the conjunctiva represents a distinct clinical, histopathological, and immunological entity. Its classic presentation over a short period of a few weeks and poor response to topical steroid treatment should aid the ophthalmologist in recognising this lesion. Of practical importance to the ophthalmic pathologist is recognition that the granulomatous inflammation may be associated with elastotic degeneration and does not necessarily imply the presence of a foreign body, fungal, or mycobacterial infection.

References

Unilateral nasal hemianopsia secondary to posterior subcapsular cataract

Visual field defects respecting the vertical midline are a common occurrence associated with focal neurological lesions. However, unilateral nasal hemianopsias are rare defects, documented to be associated with pituitary adenomas, temporal optic nerve lesions, and suprasellar aneurysms. Cataracts are known to depress the overall sensitivity of the visual field,\(^1\) but localised visual field defects due to cataract are extremely rare and, to our knowledge, only three other cases have been reported in the literature.\(^2\) We report a case of a right unilateral nasal hemianopsia resulting from central posterior subcapsular lens opacity.

Case report

A 51 year old woman treated for normal tension glaucoma in her right eye for 2 years attended for a review of her glaucoma following a change of medication with the addition of bimodine eye drops to dorzolamide eye drops. At this 3 monthly review the patient

\[ \text{Pattern deviation} \]

<table>
<thead>
<tr>
<th>MD</th>
<th>PSD</th>
<th>SF</th>
<th>CPDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5.94 dB</td>
<td>p &lt; 0.5%</td>
<td>4.22 dB</td>
<td>p &lt; 2%</td>
</tr>
</tbody>
</table>

Figure 1 Humphrey 24-2 visual field showing (A) precataract visual field, (B) field with cataract and visual field defect, (C) visual field after cataract removal.

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Routine blood tests and chest X-ray were normal. There were no other risk factors for a vascular event, although there is a positive family history—her father had had a cerebrovascular accident.

On examination, her visual acuity had decreased to 6/60 to 6/24 in the right eye, remaining unchanged at 6/6 in the left since the previous visit. It had also been documented that letters on the nasal side of the Snellen chart were not seen with the right eye. Confrontation visual field demonstrated a nasally hemianopia of the right eye. Her pupils were equal with normal reactions to light and accommodation. Dilated slit lamp biomicroscopy revealed marked central posterior subcapsular lens opacity with very mild subcapsular changes in the other eye, previously documented as normal. Retinal examination was normal and the optic discs pathologically cupped with inferior rim thinning changes consistent with glaucoma, although there were no documented changes from the previous visit 6 months earlier.

Further neurological and cardiovascular evaluation, including an echo-cardiogram obtained at a blood pressure of 170/70 mm Hg, were also unremarkable.

The right nasal hemianopia respecting the vertical midline was confirmed on a clinically reliable Humphrey 24-2 plot with a mean deviation from −5.94 to −17.43 from the previously documented visual field (see Fig 1). The visual field of the left eye was normal. Routine blood tests and chest x-ray were normal. A computed tomograph (CT) scan of the brain and orbital visual pathways were also unremarkable. In the absence of a focal neurological lesion this woman subsequently underwent an uncomplicated right phacoemulsification and intraocular lens replacement. A repeat red spot visual field revealed complete reversal of the previously documented right nasal hemianopia, and a restoration of the visual acuity to 6/6.

**Comment**

Media opacities are known to cause visual field defects, the degree of which varies from generalised depression of the visual field to apparent scotomatous areas. Localised paraxial lens opacities causing defects mimicking neurological abnormalities are extremely rare. These opacities necessitate a posterior position in the lens to produce a relative scotoma. An opacity in the media anteriorly overlaid with one drop of mineral oil and contained 10 mM TRIS-HCl (pH 7.5), 1 mM EDTA, pH 7.9, 0.5% SDS) and the protease K (100 µg/ml) were added to the specimens and incubated overnight at 37°C. The standard phenol-chloroform extraction and the ethanol precipitation were used for DNA purification and the pelleted DNA was resuspended in 50–100 µl of tridistilled sterile water. To determine the quality and quantity of the isolated DNA, each pelleted DNA sample was analysed by electrophoresis on 1% agarose gels stained with ethidium bromide and viewed spectrophotometrically.

**Material and methods**

Samples were obtained from consecutively treated patients treated at the ophthalmologic clinic of Taipei Veterans General Hospital. Medical and ophthalmologic histories were recorded for each patient, a slit lamp microscope examination was performed, and pterygia were photographed before surgery. In each case, a specimen of adjacent clinically normal conjunctival tissue (from the 12 o’clock position of the corneconjunctival limbus) was obtained immediately after surgery, tissue specimens (pterygia, pingueculae, or conjunctival tissues) were stored at −70°C.

**Lack of human papillomavirus in pterygium of Chinese patients from Taiwan**

We read with interest that Gallagher et al had demonstrated the association of human papillomavirus (HPV) and pterygium by polymerase chain reaction (PCR). Several hypotheses concerning the pathogenesis of pterygia have been proposed, including exposure to ultraviolet irradiation and other environmental factors, genetic predisposition, and viral infection. The various theories regarding pterygium formation imply that much about the pathogenesis of pterygia remains to be investigated.

The involvement of HPV in the genesis of pterygia is controversial. Some authors have demonstrated that HPV is present in 24–50% of specimens, whereas others have failed to detect HPV in pterygia. To help resolve this dilemma, we evaluated 65 pterygia, 23 pinguecula, and 88 normal conjunctiva derived from Chinese patients in Taiwan for the presence of HPV DNA. We used PCR with three different consensus primer sets—MY09/MY11 (MY), L1C1/L1C2-1 (LC), and GP5/GP6 (GP).

**References**

To control the quality of the isolated DNA internally, the 268 bp sequence of β-globulin gene was amplified using PC04 primers and GH20 (5′GAAGAGCCAAGGACAGGC-3′ and 5′CAACTTCATCCACGTTCACC-3′) primers in the multiplex PCR with the MY, LC, or GP primers. DNA samples extracted from cell cultures infected with HPV were used as a positive control. Each PCR product was analysed by electrophoresis on 2% agarose gels stained with ethidium bromide.

PCR with MY09 and MY11 consensus primers

The PCR with MY09/MY11 was performed as described previously. The PCR mixture was complemented with 2.5 mM MgCl₂, 0.1 mM of each dNTP, 0.5 μM MY09 and MY11 primers (Table 1), and 0.3 μM PC04 and GH20 primers. The DNA amplification was carried out during 30 cycles that included denaturation at 92°C for 30 seconds, annealing at 53°C for 30 seconds, and primer extension at 72°C for 30 seconds.

PCR with L1C1, L1C2-1 consensus primers

The PCR with L1C1/L1C2-1 was performed as described previously. The PCR mixture was complemented with 2.5 mM MgCl₂, 0.2 mM of each dNTP, 0.5 μM L1C1, and 0.25 μM L1C1-1 primers (Table 1). The DNA amplification was carried out during 30 cycles that included denaturation at 92°C for 30 seconds, annealing at 53°C for 30 seconds, and primer extension at 72°C for 30 seconds.

PCR with GP5, GP6 consensus primers

The PCR with GP5/GP6 was performed as described previously. The PCR mixture was complemented with 2.5 mM MgCl₂, 0.05 mM of each dNTP, 0.5 μM GP5 and GP6 primers (Table 1) and 0.3 μM PC04 and GH20 primers. The DNA amplification was carried out during 40 cycles that included denaturation at 94°C for 30 seconds, annealing at 53°C for 30 seconds, and primer extension at 72°C for 30 seconds.

Results

The specimens included 65 conjunctival pterygia, 23 pingueculae, and 88 normal conjunctivae. Characteristics of patients are shown in Table 2. We were unable to detect any HPV DNA fragments in the 23 specimens of pingueculae, 65 specimens of pterygia, and 88 specimens of normal conjunctivae tested.

Comment

It has been proved that HPV possesses oncogenic potential and contributes to the development of various preneoplastic and neoplastic conditions. DNA of many types of HPV, particularly types 16 and 18, has been detected in papillomas, dysplasia, and cancers observed on the eyelids, lacrimal outflow tract, conjunctiva, and cornea. In this study, three sets of consensus primers, MY, LC, and GP, were used; we were unable to detect HPV in any pterygium, pinguecula, or normal conjunctival specimen from Chinese patients in Taiwan, where the prevalence of pterygia is high.

Three studies have addressed the presence of HPV DNA in pterygia and all used PCR amplification with a single primer (Table 3). These reports demonstrated big differences in frequencies, from 0% to 100%, and variety of HPV types (type 6, 11, 16, 18) that could be possibly explained by the different primers used, the absence of adequate controls, small sample size (10–50 specimens), and the possible different frequencies of HPV infection in geographically distinct populations. Confirmatory larger studies in different geographic populations using more efficient primer(s) are needed to clarify the relation between HPV infection and pterygium formation.

The similar controversy occurred in the detection HPV DNA of malignant epithelial neoplasms of conjunctiva but not squamous cell papilloma of conjunctiva. By reviewing the published data of previous reports, HPV positive rates in conjunctival papilloma specimens were quite consistent, from 44–75%, and most of the HPV types were type 6 and 11 that were classified as low risk HPV genotypes. But in the case of malignant epithelial neoplasms of conjunctiva, the frequencies of HPV detection varies from 0–100% and both low risk, HPV-6 and HPV-11, and high risk, HPV-16 and HPV-18, groups were found by various molecular techniques.

Owing to different populations studied and the absence of a gold standard HPV detection technique and adequate controls in most studies published to date, there are marked variations in the obtained HPV prevalence rates in pterygium. Therefore, HPV probably does not act alone in the development of pterygium and the exact role of HPV in the pathogenesis of pterygium remains unclear. The lack of HPV DNA in pterygium in this study may indicate either the HPV is not associated with pterygium formation or that the technique was not adequate for demonstration of such an association. Based on our data, we suggest that HPV is not a required cofactor in the development of pterygia.

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References


Table 2 Characteristics of patients with pterygia and pinguecula

<table>
<thead>
<tr>
<th></th>
<th>Pterygium (%)</th>
<th>Pinguecula (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients (M/F)</td>
<td>65(40/25)</td>
<td>23(15/8)</td>
</tr>
<tr>
<td>Age (years, mean (SE))</td>
<td>63.3 (5.9)</td>
<td>58.3 (7.4)</td>
</tr>
<tr>
<td>(range 55.5–82.3)</td>
<td>(range 44.4–71.2)</td>
<td></td>
</tr>
<tr>
<td>Medication for conjunctivitis</td>
<td>20 (30.8)</td>
<td>3 (13.0)</td>
</tr>
<tr>
<td>Duration of lesion (years, mean (SE))</td>
<td>9.8 (3.7)</td>
<td>18.1 (7.9)</td>
</tr>
<tr>
<td>(range 5.5–21.5)</td>
<td>(range 10.0–28.5)</td>
<td></td>
</tr>
<tr>
<td>Conjunctivitis history (%)</td>
<td>24 (36.9)</td>
<td>2 (8.7)</td>
</tr>
</tbody>
</table>

Table 3 Literature reports of human papillomavirus detection in pterygia

<table>
<thead>
<tr>
<th>Authors (year published)</th>
<th>No of specimens</th>
<th>Type of specimen</th>
<th>Method/prime</th>
<th>Positive rates (HPV types)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dolemtch et al. (1996)</td>
<td>16</td>
<td>Pterygium</td>
<td>Immunohistochemical stain</td>
<td>100% (16 [6, 11, 18])</td>
</tr>
<tr>
<td>Dushku et al. (1999)</td>
<td>13</td>
<td>P + R</td>
<td>MY09/MY11</td>
<td>0</td>
</tr>
<tr>
<td>Detorakis et al. (2000)</td>
<td>50</td>
<td>P + R</td>
<td>GP5/GP6</td>
<td>24% (18)</td>
</tr>
<tr>
<td>Gallagher et al. (2001)</td>
<td>10</td>
<td>P + R</td>
<td>MY09/MY11</td>
<td>50% (6, 11, 16)</td>
</tr>
<tr>
<td>Chen et al. (current study) (2002)</td>
<td>65</td>
<td>P + R</td>
<td>L1C1/L1C2-1, GP5/GP6</td>
<td>0</td>
</tr>
</tbody>
</table>

P = primary; R = recurrent.
Factor V Leiden mutation does not correlate with retinal vascular occlusion in white patients with Behçet's disease

The factor V Leiden (FV Leiden) mutation causes resistance to activated protein C by substituting the Glu<sup>202</sup> residue with arginine at the cleavage site for activated protein C. Heterozygous carriers of the FV Leiden mutation have an increased risk of venous thrombosis between threefold and sevenfold in population based and family studies. Behçet's disease is a chronic inflammatory multisystem disorder that affects young adults. The principal cause of visual loss in this disease is recurrent retinal vein occlusion probably due to a combination of retinal vasculitis and thrombus formation. Thrombosis in Behçet's disease carries a poor ocular and systemic prognosis, so the presence of an identifiable and significant risk factor could be an indicator for antithrombotic treatment.

Two recent studies have implicated FV Leiden in the pathogenesis of thrombosis in Turkish patients with Behçet's disease. In one study, 30% of patients with Behçet's disease complicated by thrombosis were heterogeneous or homozygous for factor V Leiden compared to 5.9% of factor V Leiden negative patients. In the second study, factor V Leiden was detected in 37.5% of patients with Behçet's disease and a thrombotic history, compared to 9.4% of non-thrombotic patients. We have previously shown in a study of 106 Middle Eastern patients with Behçet's disease and 120 racially matched controls that the prevalence of factor V Leiden was significantly higher among patients with ocular inflammation (odds ratio 1.67) and was even more prevalent in patients who had developed retinal vascular occlusive disease (odds ratio 2.57).

In this current study we analysed the association between factor V Leiden and clinical features of Behçet's disease in white patients from the United Kingdom. The results show that the threefold rate in the Middle Eastern Behçet's disease patients, factor V Leiden was not associated with Behçet's disease in UK patients.

Patients

DNA samples from 53 white patients with Behçet's disease were collected from individuals attending the Behçet's disease clinic at the Medical Eye Unit, St Thomas's Hospital, London. All patients fulfilled the international criteria for Behçet's disease. Middle Eastern and Afro-Caribbean patients were excluded from this study. A total of 150 white controls from the London area were provided from our DNA bank. Patients' clinical details were recorded following full systemic and ocular examination, the diagnosis of retinal vein occlusion being recorded following fluorescein angiography.

Table 1 Clinical and genetic data on 53 white patients with Behçet's disease (BD), and 100 healthy white controls

<table>
<thead>
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<th>No (%)</th>
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</table>
| **BD patients (n=53)**
| Sex | Male 28 (53%) | Female 25 (47%) |
| Ocular disease | Yes 39 (74%) | No 11 (21%) |
| HLA-B*51 | Positive 22 (42%) | Negative 31 (58%) |
| FV Leiden | Positive 2 (3.8%) | Negative 51 (96.2%) |
| **Controls (n=100)**
| HLA-B*51 | Positive 6 (6%) | Negative 94 (94%) |
| FV Leiden | Positive 5 (5%) | Negative 95 (95%) |

Factors in the pathogenesis of thrombosis in Turkish patients with Behçet's disease, however, only one of these individuals had evidence of retinal occlusion.

Comment

The factor V Leiden mutation has been linked with ocular disease in Middle Eastern patients with Behçet's disease, in particular those with proved retinal venous thrombosis. The current data on UK patients with Behçet's disease do not show a similar association. The prevalence of FV Leiden in the patient group was no different from the control group. Moreover, while both patients positive for FV Leiden had ocular disease this is against a background of a high level of eye disease in this group. There are several possibilities that could explain the difference between the groups. Firstly, the presence of FV Leiden in the Middle Eastern population was particularly high (17%) and this may have accounted for the functional role of this molecule in retinal venous thrombosis in this ethnic population. By comparison, the low prevalence of the mutation in white people suggests that much larger numbers of Behçet's disease patients will need to be tested to identify any possible association. This has been supported by studies on other European patients with Behçet's disease where FV Leiden was not identified as a risk factor for systemic venous thrombosis. Moreover, in our previous study, we identified several patients who were homozygous for FV Leiden mutation and were clinically blind. In a population with such a high prevalence of the mutation, homozygosity will be more common and may have biased the data in favour of an association between Behçet's disease and severity of ocular disease in the patient group.

Secondly, recent studies in relatives of individuals with venous thrombosis have shown that the presence of FV Leiden adds only a threefold risk of thromboembolism. Over half of these events were linked to other risk factors such as pregnancy, surgery, or oral contraceptives. This would suggest that in the general white population genetic mutations affecting proteins involved in the coagulation cascade might only be associated with thrombosis in individuals with concurrent risk factors.

Thirdly, population specific phenotypic effects have been described for other gene polymorphisms. In a worldwide survey of HIV+ and HIV individuals, a particular haplotype of the RANTES gene was associated with an increased risk of acquiring HIV-1, and accelerated disease progression, in European Americans, but not African-Americans. A second RANTES haplotype was associated with delayed progression of disease in Japanese.
patients, but not in other ethnic groups of patients, probably because this haplotype is rarely found in non-Far East Asians.2 There are several other factor V gene polymorphisms that may be involved in white patients and these could be an area for future study.3 These results suggest that interindividual and interpopulation specific genotypes are associated with disease although the phenotypic outcome remains the same. Therefore gene polymorphisms that associate with disease in one population cannot be regarded as associated with the disease in different ethnic groups. It may not be possible to identify genes involved in severity of a complex disease such as Behcet's disease, which will hold across different patient populations.

Localised corneal amyloidosis

Amyloid deposits are secondary protein structure diseases in which insoluble protein fibrils accumulate extracellularly. Twenty different types of fibrils have been described in human amyloidosis, each with a different clinical picture. Amyloidosis can be generalised, affecting multiple organ systems, or localised and can affect almost any organ of the body. In the eye amyloid is the material commonly seen in lattice corneal dystrophy. Cases of localised corneal amyloidosis have been reported in literature but are quite rare.4,5 We report a case of localised corneal amyloidosis presenting as a large raised gelatinous vascularised lesion in a patient with long standing herpetic keratitis.

Case report

A fit and healthy 34 year old woman was a tertiary referral to the corneal clinic with a long standing history of a lesion on her right cornea. The initial presentation as a teenager was of a red sore right eye with a corneal ulcer that was treated as a bacterial ulcer for a few years and later on as recurrent herpetic keratoconjunctivitis. She had had numerous intermittent courses of combined topical antivirals and steroids with resolution of symptoms. Over the past 2 years she was noted to develop a raised vascularised lesion over the right cornea, which gave a constant foreign body sensation and occasional episodes of pain. It was the appearance of the lesion and the discomfort rather than the reduced visual acuity, which prompted her to seek treatment. On presentation in the clinic she had a visual acuity of 6/36 right (6/24 with pinhole) and 6/6 left eye. Anterior segment examination showed a large, raised, gelatinous, slightly nodular, vascularised lesion on the right cornea (Fig 1). The rest of the anterior segment examination was normal. Ocular adnexae did not show any signs of chronic lid disease. The corneal sensation was intact. A superficial keratectomy was performed under general anaesthesia to excise the lesion. Histopathological examination of the specimen revealed a diagnosis of amyloidosis (Fig 2).

Comment

Amyloidosis can be either primary or secondary, both of which can be further classified into systemic and local disease. Systemic primary amyloidosis can affect various ocular structures presenting as papules or purpura on the lids, conjunctival deposits, external ophthalmoplegia, vitreous opacities, and glaucoma. Secondary systemic amyloidosis rarely affects the eye, although a case of conjunctival amyloidosis has been reported in a patient with rheumatoid arthritis.6

Stafford and Fine, for the first time in 1966, reported a case of corneal amyloidosis in a young girl with ocular complications of retinopathy of prematurity.7 Primary familial amyloidosis, which presents as nodular white subepithelial protuberances in the central cornea, has been postulated to be autosomal recessive.8 In secondary localised corneal amyloidosis, the nasal mucosa is proposed as a result of chronic inflammation and irritation from scarred lids from trachoma, trichiasis, or long standing corneal scars.4,5,6 To the best of our knowledge its association with herpetic keratitis has not been reported.

Macpherson et al retrospectively examined 200 specimens of corneas removed for various reasons specifically for amyloid deposits and found it present in seven cases (3.5%).1 It has been proposed that the basal cells of the corneal epithelium are responsible for the synthesis of amyloid, although other sources have been also proposed.9

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Department of Pathology

References


Bilateral macular staphylomas in a patient with cone dystrophy

A posterior staphyloma is characterised by scleral ectasia and is pathognomonic for pathological myopia.10 Posterior staphylomas are classified into five types based on the anatomical location.1 Type I staphylomas extend from the nasal border of the optic nerve into the macular region and are the most frequent staphyloma seen in myopes.1 Type 2 staphylomas are centred on the macular while type 3 staphylomas are centred on the optic nerve.
A 32 year old white woman presented to the Wilmer Ophthalmological Institute, Baltimore, MD, for a second opinion. She reported having progressively worsening vision since childhood and was diagnosed with cone-rod dystrophy at age 18 by an outside ophthalmologist. She experienced photophobia both indoors and outdoors. She denied recent changes in her vision. Past ocular history was otherwise significant for a remote history of corneal abrasion in the right eye. Past medical history and family history were non-contributory.

In summary, we have described a patient whose findings are consistent with a diagnosis of cone dystrophy compounded by bilateral macular staphylomas. We believe that this does not represent congenital achromatopsia given the absence of nystagmus and the history of progressively worsening vision. Although there is a report of familial cone dystrophy with bilateral macular colobomata,6 we are unaware of a case of bilateral macular staphylomas associated with cone dystrophy. To our knowledge, this case represents a previously unreported association of cone dystrophy with macular staphylomas. Awareness of this association will hopefully contribute to proper diagnosis as this finding had presumably been missed in previous ophthalmological examinations.
Given the significant association of macular staphylomas with numerous complications listed above, especially the risk for choroidal neovascularisation and haemorrhage, such patients should receive counselling regarding its symptoms and receive periodic comprehensive ophthalmological examinations.

Financial interests: None.

References


Bloody tears, or haemolacra, are an occasional feature of hereditary haemorrhagic telangiectasia, and tumours of the lacrimal apparatus. In the emergency department, however, they are more commonly encountered accompanying epistaxis. To date, Medline lists only a single case report of haemolacria in this context, and the photograph presented here may well be the first of the phenomenon.

Its anatomical basis lies in the intimate connection of nose and eye via the lacrimal apparatus. An increase in pressure within the nasal cavity during epistaxis—for example, by pinching or blowing the nose, can cause retrograde flow of blood through the system and thus lead to bloody tears emerging from the ipsilateral eye.

As our patient had longstanding perforation of both tympanic membranes, the blood in her nose was also able to travel retrograde via the auditory tube and middle ear into the external auditory canal. This led to the additional bleeding from the right ear. Bleeding was readily controlled by nasal sponge tamponade. The patient made an uneventful recovery.

Financial support: None.

Financial interests: None.

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References


Bloody tears, and more! An unusual case of epistaxis

A 56 year old woman presented to the emergency department with a 2 hour history of bleeding from the right nostril. She had tried to stop it by pinching her nose but had then also experienced bleeding from her right eye and ear (Fig 1).

Figure 1 Right sided haemolacra and bloody otorrhoea in the context of epistaxis. Photograph reproduced with the consent of the patient.

Intraocular pressure was within the normal limits in both eyes. Left eye fundus examination showed a vitreous inflammation (cells: + +) and a whitish retinocochorial lesion surrounded by a large preretal haemorrhage. Hard exudates were present in the macular area.

Investigations revealed an erythrocyte sedimentation rate of 6 mm in the first hour (reference range 1–12), and a normal white blood count. Serological testing for toxoplasmosis gave negative results for IgM but IgG titres were 40 IU/ml (reference range >3). Serology tests for Borrelia burgdorferi, Treponema pallidum, and HIV were normal. An acute infection was suspected and we decided to perform an anterior chamber tap. Polymerase chain reaction (PCR) (toxoplasmosis, CMV, HSV, VZV) gave negative results, but the Goldmann-Witmer coefficient was 13.64 (reference range <4), revealing a local production of anti-toxoplasmic immunoglobulins. Tests for sarcoidosis and for connective tissue disorders were negative. Immunoglobulin electrophoresis, quantitative immunoglobulin levels, CD4+ lymphocyte count, C3-C4 and CH50 examination were within the normal range. PPD skin test was just positive (7 mm). Chest x ray was normal.

Based on these findings, a TRC was suspected. The patient was treated with sulphadiazine (4 × 1 g/day), pyrimethamine (2 × 25 mg/day) and folic acid, during 6 weeks. Topical steroids and mydriatic drops were also prescribed. Prednisone (1 mg/kg) was introduced, at tapering doses, during the treatment.

After 3 months, visual acuity returned to 20/20 without a correction in the left eye. Anterior segment examination was normal. Left eye posterior segment examination disclosed a regression of the haemorrhages and a white chorioretinal scar with hard exudates located around the fovea. Kyrieleis’s plaque were also observed along the inferior papillary arterial vessel (Fig 2).

The patient was followed during 2 years and no reactivation of the RC was observed. Moreover, tests to exclude an immune disease were still within the normal limits (HIV, immunoglobulin electrophoresis, quantitative immunoglobulin levels, PPD skin test, CD4+ lymphocyte counts, C3-C4, and CH50).

Comment

The most classic presentation of an active toxoplasmic lesion is that of a whitish and oedematous necrotising RC close to an old pigmented scar. A severe vitreous retinoschisis, with an irregular vitreous and ocular involvement occurs after a transplacental transmission, throughout pregnancy, but the infection can also be acquired. In immunocompetent patients, TRC is the most common cause of infection affecting the posterior segment. Clinically, the lesion appears as a white focal necrosis involving the full thickness of the retina, at the margin of an old pigmented chorioretinal scar. A vitreous inflammation is usually present and occasionally vascularis is observed. 

We report the case of a healthy patient who developed an unilateral haemorrhagic retinocochorial (RC). The investigations performed were positive for a TRC.

Case report

A 43 year old African man was referred with a 10 day history of a painless progressive visual loss affecting the left eye. No other ophthalmological or systemic complaints were present. His past medical history was unremarkable.

Ophthalmological examination disclosed a vision of 20/200 in the right eye without correction and in the left eye the best visual acuity was 20/200. Anterior segment examination was normal in the right eye but revealed a mild inflammation in the left.
inflammatory reaction is usually associated, appearing as a “headlight in the fog.” Lesions can occur anywhere in the posterior segment but most of the time, they are located in the macular area, affecting one or both eyes. Associated findings include the presence of an inflammatory sheathing of retinal vessels. However, a variety of clinical presentations have been reported in the past; Friedmann et al described the presence grey-white fine punctuate lesions affecting the deep retina with a mild vitreous inflammation. Direct optic nerve involvement by the protozoan was described by Zimmermann in 1956. More recently, various clinical aspects of TCR were described in immunocompromised hosts, appearing as diffuse areas of retinal necrosis or as a bilateral retinal retinitis. Ocular occlusive vasculitis can be seen in inflammatory diseases including Behget’s syndrome, sarcoidosis and systemic lupus erythematosus, in infectious disorders (syphilis, acute retinal necrosis), and in TCR. Branch artery obstruction has been reported when a vessel passes through an acute TCR, as well as retinal vein occlusion. The case reported here was diagnostically challenging as the fundus appearance was not characteristic of classic TCR. In fact, haemorrhages are more frequently found in viral infections such as cytomegalovirus retinitis. This feature could be explained by damage to the vascular wall passing through the RC, without signs of a vascular obstruction.

This case demonstrates the importance of including toxoplasmosis in the differential diagnosis of unilateral haemorrhagic RC in immunocompetent patients.

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References


Topical dorzolamide and metabolic acidosis in a neonate

We describe a neonate with bilateral Peter’s anomaly who became unwell and developed a metabolic acidosis after commencing topical dorzolamide. He was fully investigated to exclude other causes of acidosis, and subsequently improved on discontinuation of topical treatment. To the best of our knowledge, there have been no reports of topical carbonic anhydrase inhibitors causing metabolic acidosis in children or adults.

A 5 day old boy was referred to a tertiary paediatric ophthalmology unit with bilateral corneal opacities for consideration of penetrating keratoplasty. He had a normal Apgar score at delivery at 35 weeks’ gestation and weight 2.3 kg. In addition, he had had full screening investigations including blood gases, abdominal ultrasound, and DMSA scans because of a prenatal history of intrauterine growth retardation with suspicion of a single kidney. Ocular examination revealed total left corneal opacification and a small opacity of the right cornea inferiorly. Intracocular pressures measured were normal but since digitisation of Trusopt at his regular paediatric follow up, he was treated with a 25 mg/kg dose per kg systemic absorption of topically applied Trusopt eye drops, with no problems with local tolerance or adverse systemic effects. The eye drops were stopped and he was discharged from hospital.

Secondary glaucoma is well recognised in cases of Peter’s anomaly and raised IOP is well known to cause corneal clouding. Congenital corneal opacities necessitate urgent treatment in order to reduce amblyopia, and therefore it is essential to exclude glaucoma. Topical Trusopt (MSD) is used routinely at the department of ophthalmology, Great Ormond Street, as it is thought to have lower potential for adverse systemic effects than topical β blockers.

Topical dorzolamide is a potent inhibitor of CA-11 and this inhibition decreases the rate of aqueous humour secretion consequently lowering IOP. In the proximal renal tubule CA-II is also required to sustain maximal rates of HCO3 reabsorption. Significant systemic inhibition of carbonic anhydrase has not been observed and there has been an absence of demonstrable metabolic effects in adults. However, with the oral carbonic anhydrase inhibitor, acetazolamide, the renal carbonic anhydrase involvement and acidosis have been shown to be proportionally related to the plasma concentration levels of the drug. The dose per kg systemic absorption of topically applied dorzolamide hydrochloride is usually less than 10 mg/kg.

Seven days following the commencement of Trusopt at his regular paediatric follow up appointment, he was found to be sleepy with poor feeding and poor capillary refill. There was no history of diarrhoea or vomiting. Arterial blood gases revealed a metabolic acidosis with a pH 7.08, Pco2, 4.2 kPa, P02, 11.3 kPa and bicarbonate 9.3 mmol/l and base excess of -20.2. There were no markers of infection with negative blood, urine, stool, throat, and nasal cultures. Anion gap, serum electrolytes, liver function and urinalysis for pH, specific gravity, and electrolytes were also unremarkable. Renal ultrasound and DMSA scan showed a normal functioning single right kidney.

As the cause for the metabolic acidosis at this stage was unknown he was given intravenous cefotaxime, flucloxacillin, half correction bicarbonate infusion followed by oral sodium bicarbonate supplements for 3 days. He showed some improvement with treatment; however, he remained significantly acidic and unwell. At routine ophthalmic review 5 days later, while free of all other treatments, the eye drops were stopped and he showed spontaneous next-day resolution of his acidosis. He symptomatically improved and gained weight over the subsequent few days (Fig 1).

Topical dorzolamide has been shown to cause significant reduction in intraocular pressure (IOP) in children and is well tolerated. Secondary glaucoma is well recognised in cases of Peter’s anomaly and raised IOP is well known to cause corneal clouding. Congenital corneal opacities necessitate urgent treatment in order to reduce amblyopia, and therefore it is essential to exclude glaucoma. Topical Trusopt (MSD) is used routinely at the department of ophthalmology, Great Ormond Street, as it is thought to have lower potential for adverse systemic effects than topical β blockers.

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administered dorzolamide would be expected to be higher in neonates/infants of lower body weight compared with adults.

Metabolic acidosis with normal anion gap and serum electrolytes in the absence of diar-

rhea, as in this case, is more likely to be due to proximal renal tubular bicarbonate loss.

Spontaneous improvement of the acidosis on termination of the topical dorzolamide is strongly suggestive of the culpability of dorzolamide. It is unclear as to why this hap-

pened, but factors such as prematurity, low birth weight, renal tubular immaturity, and one functioning kidney may have led to poor handling of drug elimination at a higher sys-

temic concentration. Although we feel dor-

zolamide is a relatively safe topical antihyper-
tensive treatment, this case underlines the need for caution when treating neonates.

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References


Recurrent infectious crystalline keratopathy caused by different organisms in two successive corneal grafts in the same patient

Infectious crystalline keratopathy (ICK) is a rare complication of penetrating keratoplasty characterized by indolent infectious keratiti-
s in which needle-like, branching crystalline opacities are seen within the corneal stroma, in the absence of appreciable corneal or ante-
rior segment inflammation.1 We report an unusual case of recurrent ICK which occurred in two successive corneal grafts.

Case report
A 63 year old man underwent penetrating keratoplasty for aphakic bullous keratopathy. The immediate postoperative course was uneventful. Topical corticosteroid (dexamethasone 0.1%) was initially given four times daily, and then was tapered to twice daily. Seven months after transplantation, visual acuity decreased to counting fingers with no other symptoms. Slit lamp examination showed a focal area of non-suppurative branching intrastromal white opacities (Fig 1). Corneal scrapings for diagnostic smears and cultures were performed. Microscopic examination of the smears showed dense groupings of many Gram positive cocci with no inflammatory cells. Cultures grew Streptococcus viridans and were negative for fungi. The patient was treated hourly with two fortified antibiotic eyedrops (amikacin, vancomycin) and topical rifamicyn. Topical antibiotic therapy was gradually tapered over 12 months. Topical dexamethasone was withdrawn and topical ciclosporin was used to maintain an immunosuppression. Despite intense treatment with appropriate antibiotic therapy, ICK increased in size and evolved simulta-
eneously towards abscess and acute rejec-
tion. The subsequent corneal condition was severe residual scarring of the central cornea with diffuse neovascularisation. A second penetrating keratoplasty was then performed 19 months after the first transplantation. Topical dexamethasone, ciclosporin, and rifamicyn were given four times daily. Three months after the second graft, slit lamp examination showed a large central epithelial defect with multiple diffuse white opacities confined to the anterior stroma. These multi-
ple opacities merged into a larger confluent dense opacity near the continuous suture (Fig 2). Cytological studies and cultures of the cor-
neal scrapings were performed. Light microscopy disclosed aggregations of many fungi with no inflammatory cells. Cultures yielded Candida albicans sensitive to amphotericin B and fluconazole. Bacterial cultures were nega-
tive. Topical amphotericin B was started every hour, along with oral fluconazole. Cortico-
steroids were stopped and topical ciclosporin was maintained. Despite intense treatment, the infectious keratopathy slowly worsened over 6 months and the corneal infiltrates were replaced by scarring and neovascularisation.

Comment
Typically, ICK develops in a corneal graft after a long term use of topical corticosteroids. Chronic topical corticosteroids used to pre-
vent graft rejection produces relative immuno-
suppression allowing infection to develop with little or no inflammation in the cornea. Gram positive cocci, usually Streptococcus viri-
dans, are commonly isolated from ICK lesions, but other bacteria, fungi, and mixed infec-
tions have been reported.2 To the best of our knowledge, recurrent ICK has never been re-
ported in two successive corneal grafts and with two different organisms. Appropriate laboratory evaluation is therefore necessary to guide specific antimicrobial therapy. Discon-
tinuation of topical steroids with aggressive antibiotic therapy may suffice, but continued infection, vascularisation, or scar formation may sometimes affect visual acuity and corneal graft survival. In this case, medical treatment failed, despite in vitro susceptibility of micro-organisms to antibiotics and anti-
fungal drugs. Moreover, immunosuppression (that is, corticosteroids, ciclosporin), neces-
sary to prevent graft rejection, worsened the infection and did not prevent the acute rejec-
tion process from developing.

In conclusion, this case suggests that local immunosuppression and factors related to the patient ocular surface may be predisposing factors for the development of ICK.

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References


www.bjophthalmol.com
Rosai Dorfman disease or sinus histiocytosis with massive lymphadenopathy of the orbit

Sinus histiocytosis with massive lymphadenopathy (SHML) or Rosai Dorfman syndrome is a rare benign proliferative histiocytic disease of unknown origin. It predominantly affects the lymph nodes. The head and neck region usually in association with lymph node involvement, represents one of the most common extranodal areas affected by SHML. The other common extra nodal site is skin. Rarely, there is widespread dissemination with liver, kidney, respiratory organs, orbit, and eyelid involvement. The mean age of onset is 20 years (birth to 74 years).

Case report

A 57 year old woman with a 6 month history of double vision was referred to the Victorian Eye and Ear Hospital, Dublin. She was found to have proptosis, ptosis, diplopia due to inferior rectus dysfunction, and restriction of elevation of the left eye. Her visual acuity was normal. Relevant investigations showed a high erythrocyte sedimentation rate (ESR) of 44 mm in the first hour, C reactive protein of 1.9 (normal less than 1). Her thyroid function tests, including thyroid microsomal and thyroglobulin antibodies, were normal. The anti-TPO choline receptor antibodies were also negative. A computed tomograph (CT) scan of the orbit was performed which showed an extraocular soft tissue mass with well defined margins in the inferomedial part of the left orbit and no separation from inferior and medial rectus. There was no bony erosion and the optic nerve appeared normal. She had an excision biopsy performed through lateral orbitotomy with Wright’s modification.

The tumour was removed within the capsule, it was found to be adherent to the inferior and lateral rectus. Histological examination of the tumour revealed an inflammatory process composed of aggregates of lymphocytes, with reactive lymphoid follicles, plasma cells, and groups of large histiocytes with abundant foamy cytoplasm. The inflammatory process extended around the nerves. There was no vasculitis, areas of coagulative necrosis, or granuloma formation. The large histiocytic cells were characterised by round to oval, vesicular, hypochromatic nuclei with vesicular chromatin and abundant eosinophilic, foamy or clear cytoplasm with poorly defined cell borders. Emperipolysis was present. The phagocytosed cells were most often erythrocytes, lymphocytes, and polymorphonuclear leucocytes (Fig 1). Special stains for micro-organisms were negative. Immunohistochemical stains revealed the presence of diffuse S100 positivity within the cells. These cells also showed reactivity for the macrophage marker CD68. The diagnosis of Rosai Dorfman disease or SHML was confirmed.

Our patient did not have any lymphadenopathy or any other extranodal involvement. She did not receive any treatment and after 3 years’ follow up there was no sign of recurrence. She still had some residual hypotropia.

Comment

We report this case to draw attention to this unusual presentation of SHML confined to the orbit without any other extranodal lesions, which to our knowledge is the only the third reported case of this nature. SHML is a rare, benign proliferative histiocytic disease with massive lymphadenopathy. Table 1 lists the causes of histiocytic proliferations in the orbit, and generalised lymphadenopathy with AA amyloidosis. These cases were treated with chemotherapy and oral steroids, the commonest being cyclophosphamide, vincristine, mercaptopurine, and prednisolone. Treatment causes regression of the tumour and resolution of cervical lymphadenopathy with minimal recurrence. Our patient did not receive any treatment and in the 3 year follow up there was no evidence of recurrence of the disease in the orbit or any sign of sinus histiocytosis elsewhere in the body.

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References


The authors wish to correct an error in the article: A Comparison of Perimetric Results with Medmont and Humphrey Perimeters. (Br J Ophthalmol 2003; 87:690–1). Table 4, row 1, column 4 should read 1 not 2, and row 2, column 4 should read 35 not 34. Table 6, row 3, column 1 should read 24 not 27, and row 4, column 2 should read 27 not 24.

Helping the blind and visually impaired

The latest issue of Community Eye Health (No 45) discusses help for the blind, with an editorial by Sir John Wall of the Royal National Institute for the Blind on the rights of blind people. For further information...
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’s website (www.secondsight.org.uk) or by contacting Dr Lucy Mathen (lucymathen@yahoo.com).

SPecific Eye ConditionsS (SPECS)
SPecific Eye ConditionsS (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 50 different organisations related to eye disorders ranging from those that are relatively common to very rare syndromes. The website 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; website: www.eyeconditions.org.uk).

The British Retinitis Pigmentosa Society
The British Retinitis Pigmentosa Society (BRPS) was formed in 1975 to bring together people with retinitis pigmentosa and their families. The principle aims of BRPS are to raise funds to support the programme of medical research into an eventual cure for this hereditary disease, and through the BRPS welfare service, help members and their families cope with the everyday concerns caused by retinitis pigmentosa. Part of the welfare service is the telephone help line (+44 (0)1220 860 363), which is a useful resource for any queries or worries relating to the problems retinitis pigmentosa can bring. This service is especially valuable for those recently diagnosed with retinitis pigmentosa, and all calls are taken in the strictest confidence. Many people with retinitis pigmentosa have found the Society helpful, providing encouragement, and support through the Help line, the welfare network and the BRPS branches throughout the UK (tel: +44 (0)1220 821 334; email: lynda@brps.demon.co.uk; website: www.brisps.demon.co.uk).

Surgical Eye Expeditions International
Volunteer ophthalmologists in active surgical practice are needed to participate in short term, sight restoring eye surgery clinics around the world. Contact: Harry S Brown, Surgical Eye Expeditions International, 27 East De La Guerra, C-2, Santa Barbara, CA 93101-9858, USA (tel: +805 963 3303; fax: +805 963 3564; email: hsbrown.md@cox.net or seeintl@seeintl.org; website: www.seeintl.org).

Rise in organ transplant numbers
According to UK Transplant, the UK has seen the highest number of organ transplants in six years. Last year (1 April 2002 to 31 March 2003) 2777 patients had their lives saved or dramatically improved through the generosity of 1064 donors. This equated to a 6% increase compared to the previous 12 months (1 April 2001 to 31 March 2002). Furthermore during 2002–3, the highest number of people benefited from a cornea transplant for five years (1997–98) and 240 more people had their sight restored than the previous year. For further information see UK Transplant’s website (www.uktransplant.org.uk).

Elimination of avoidable blindness
The 56th World Health Assembly (WHA) considered the report on the elimination of avoidable blindness (doc A56/26) and urged Member States to ensure that they were themselves supporting the Global Initiative for the Elimination of Avoidable Blindness by setting up a national Vision 2020 plan by 2005; (2) Establish a national coordinating committee for Vision 2020, or a national blindness prevention committee to help implement the plan; (3) Implement the plan by 2007; (4) Include effective monitoring and evaluation of the plan with the aim of showing a reduction in the magnitude of avoidable blindness by 2010; (5) To support the mobilisation of resources for eliminating avoidable blindness. The WHA also urged the Director-General to maintain and strengthen WHO’s collaboration with Member States and the partners of the Global Initiative for the Elimination of Avoidable Blindness as well as aid in the coordination and support of national capability.

MSc course in Community Eye Health
The International Centre for Eye Health is offering a full time MSc course in Community Eye Health from 29 September 2003 to 19 September 2004. The course is not clinical and is specifically for eye health professionals wanting to work in the field of community eye health. The course is designed in keeping with the aims, priorities, and strategies of Vision 2020—the Right to Sight. The course costs £3939 for home students and £14 110 for overseas students. Further information: The Registry, 50 Bedford Square, London WC1B 3DP, UK (tel: +44 (0)20 7927 2239; fax: +44 (0)20 7323 0638; email: Adrienne.Burrough@lshtm.ac.uk; website: www.lshtm.ac.uk).

Ophthalmic Anesthesia Society (OAS)—17th Scientific Meeting
The 17th Scientific Meeting of the Ophthalmic Anesthesia Society (OAS) will be held 3–5 October 2003 at the Westin Michigan Avenue Chicago, Chicago, USA. Programme co-chairs; Marc Allen Feldman MD MHS and Steven T Charles MD. The CME joint sponsor is the Cleveland Clinic Foundation; CME hours are pending. Fees for OAS members are $300; non-members $475; students $50.

Further details: OAS, 793-A Foothill Blvd, PMB 119, San Luis Obispo, CA 93405 USA (tel: +1 805 534 0300; fax: +1 805 534 9030; email: info@eyeanesthesia.org; website: www.eyeanesthesia.org).

Glaucma Society 24th Annual Meeting and Dinner
The Glaucma Society 24th Annual Meeting and Dinner will take place on 20 November 2003, from 8.30 am to 9.00 pm at The Royal College of Physicians, London, UK. Further details: Ms Janet Flowers (email: glaucsoc@ukoere.freeserve.co.uk).

Detachment Course with international faculty on: Retina and Vitreous Surgery with Case Presentations preceding the Annual Meeting of Iranian Society of Ophthalmology
The detachment course with international faculty on: Retinal and Vitreous Surgery with Case Presentations preceding Annual Meeting of Iranian Society of Ophthalmology will be held on 29–30 November 2003 and 1–4 December 2003 respectively, at the Razi Conference Center, Hemmat Hyw, Tehran, Iran. Further details: Scientific programme: Prof Ingrid Kreissig, University of Tuebingen, Schleichstr. 12, Breuningerbau, 72076 Tuebingen, Germany (tel: +49 7071 295209; email: ingrid.kreissig@med.uni-tuebingen.de). Local organisation: Dr Arman Masheyekhi, Dr Siamak Moradian, Dept of Ophthalmology, Labbanfinejad Medical Center, Pasdaran Ave, Boosan 9, Tehran, 16666, Iran (fax: +98 21 254 9039; email: llabafi@hotmail.com).

5th International Symposium on Ocular Pharmacology and Therapeutics (ISOPT)
The 5th International Symposium on Ocular Pharmacology and Therapeutics (ISOPT) will take place 11–14 March 2004, in Monte Carlo, Monaco. Please visit our website for details of the scientific programme, registration, and accommodation. To receive a copy of the Call for Abstracts and registration brochure please submit your full mailing details to http://www.kenes.com/isopt/interest.htm. Further details: ISOPT Secretariat (website: www.kenes.com/isopt).

XVIth Meeting of the International Neuro-Ophthalmology Society