Laser induced chorioretinal venous anastomosis in ischaemic central retinal vein occlusion

Laser induced chorioretinal venous anastomosis (CRVA) has been advocated by McAllister and Constable as a treatment for non-ischaemic central retinal vein occlusion (CRVO).1 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.2 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. 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.

Inclusion and exclusion criteria

Inclusion criteria:
1. Confirmed presence of central retinal vein occlusion
2. Central retinal vein occlusion ≤ 3 months' duration
3. Visual acuity < 20/200
4. Intraocular pressure < 30 mm Hg
5. Ability to obtain good quality fundus photographs and angiograms
6. Age ≥ 21 years old

Exclusion criteria:
1. Intercurrent eye disease of study eye that is likely to affect visual acuity over study period
2. Presence of any diabetic retinopathy in either eye
3. New or old branch artery/vein occlusion in study eye
4. Other retinal vascular disease in study eye
5. Vitreous haemorrhage other than breakthrough in study eye
6. Presence of neovascularisation of the study eye (iris, angle, retina, disc)
7. Hepatic or warfarin sodium cannot be discontinued for duration of study
8. Impossible to differentiate between ischaemic and non-ischaemic central retinal vein occlusion

Table 1 Inclusion and exclusion criteria of patients

<table>
<thead>
<tr>
<th>Inclusion criteria</th>
<th>Exclusion criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Confirmed presence of central retinal vein occlusion</td>
<td>1. Intercurrent eye disease of study eye that is likely to affect visual acuity over study period</td>
</tr>
<tr>
<td>2. Central retinal vein occlusion ≤ 3 months' duration</td>
<td>2. Presence of any diabetic retinopathy in either eye</td>
</tr>
<tr>
<td>3. Visual acuity &lt; 20/200</td>
<td>3. New or old branch artery/vein occlusion in study eye</td>
</tr>
<tr>
<td>4. Intraocular pressure &lt; 30 mm Hg</td>
<td>4. Other retinal vascular disease in study eye</td>
</tr>
<tr>
<td>5. Ability to obtain good quality fundus photographs and angiograms</td>
<td>5. Vitreous haemorrhage other than breakthrough in study eye</td>
</tr>
<tr>
<td>6. Age ≥ 21 years old</td>
<td>6. Presence of neovascularisation of the study eye (iris, angle, retina, disc)</td>
</tr>
<tr>
<td>7. Hepatic or warfarin sodium cannot be discontinued for duration of study</td>
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</tr>
<tr>
<td>8. Impossible to differentiate between ischaemic and non-ischaemic central retinal vein occlusion</td>
<td>8. Impossible to differentiate between ischaemic and non-ischaemic central retinal vein occlusion</td>
</tr>
</tbody>
</table>

Table 2 Baseline and outcome characteristics of patients receiving laser treatment

<table>
<thead>
<tr>
<th>Patient No</th>
<th>Sex/age</th>
<th>Interval of CRVO and laser (weeks)</th>
<th>Laser used</th>
<th>No of laser sessions</th>
<th>No of laser sites attempted</th>
<th>Initial BCVA</th>
<th>Final BCVA</th>
<th>Duration of follow up (months)</th>
<th>Complication</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M/79</td>
<td>5</td>
<td>Argon</td>
<td>2</td>
<td>4</td>
<td>8/200</td>
<td>HM</td>
<td>31</td>
<td>Neovascular glaucoma</td>
</tr>
<tr>
<td>2</td>
<td>F/80</td>
<td>2</td>
<td>Diode</td>
<td>1</td>
<td>2</td>
<td>2/200</td>
<td>2/200</td>
<td>31</td>
<td>Neovascular glaucoma</td>
</tr>
<tr>
<td>3</td>
<td>F/54</td>
<td>3</td>
<td>Argon</td>
<td>2</td>
<td>4</td>
<td>4/200</td>
<td>20/200</td>
<td>19</td>
<td>Neovascular glaucoma</td>
</tr>
<tr>
<td>4</td>
<td>M/53</td>
<td>12</td>
<td>Diode</td>
<td>2</td>
<td>4</td>
<td>8/200</td>
<td>5/200</td>
<td>23</td>
<td>Neovascular glaucoma</td>
</tr>
<tr>
<td>5</td>
<td>F/80</td>
<td>6</td>
<td>Argon</td>
<td>2</td>
<td>4</td>
<td>HM</td>
<td>HM</td>
<td>7</td>
<td>Neovascular glaucoma</td>
</tr>
<tr>
<td>6</td>
<td>F/78</td>
<td>10</td>
<td>Argon</td>
<td>1</td>
<td>2</td>
<td>HM</td>
<td>2/200</td>
<td>5</td>
<td>Neovascular glaucoma</td>
</tr>
</tbody>
</table>

CRVO = central retinal vein occlusion, BCVA = best corrected visual acuity.
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References


Actinic granuloma of the conjunctiva

Actinic granuloma is a condition characterised, histologically, by a preponderance of giant cells in close relation with damaged elastic fibres and the absence of necrobiosis, lipid, mucin, and palisading of the granuloma. The term was coined in 1975 by O’Brien who described similar histological features in cutaneous lesions of patients with sun damaged skin. Actinic elastosis is the hallmark of penguinae and has been noted in association with a granulomatous reaction in only one previous report.

Over the past three decades, three cases of actinic granuloma of the conjunctiva have been documented in the literature (Table 1).**

The paucity of reports ensures that the condition is under-recognised both clinically and pathologically. We describe a further case with the novel association of scleral thinning, and further review the literature with reference to pathogenesis, disease associations, treatment, and significance for both ophthalmologists and pathologists.

Case history

A 67 year old white woman presented to the ophthalmology department with a 3 week history of a painless, red right eye. She had no previous ophthalmic problems. Significant past medical history included treated pulmonary tuberculosis and a prophylactic mastectomy for breast carcinoma 10 years previously. She had no significant family history and otherwise was generally well.

Ocular examination demonstrated a 3 x 3 mm, raised, flesh-colored, vascularised lesion on the right nasal bulbar conjunctiva with an associated corneal defect (Fig 1). Further scleral changes were observed circumferentially around the limbus under an apparently healthy conjunctiva (Fig 1, arrowhead).

Initial differential diagnosis was carcinoma in situ of the conjunctiva or metastasis from breast carcinoma, although the lesion was not clinically typical of either.

An excision biopsy was performed. During surgery the underlying sclera was noted to be degenerate with significant thinning.

Histology of the lesion demonstrated dysplasia within the squamous epithelium and prominent solar elastosis with a granulomatous response to degenerative elastic fibres. There was a lymphoplasmacytic infiltrate characteristic of an inflamed pinguecula with 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-0 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

O’Brien, in his original description of actinic granuloma, described the pathogenesis as a 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

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Review of previously published cases of actinic granuloma</th>
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<tbody>
<tr>
<td>Patient age (years)</td>
<td>Sex</td>
</tr>
<tr>
<td>Case 1, Proia et al</td>
<td>38</td>
</tr>
<tr>
<td>Case 2, Ferry et al</td>
<td>30</td>
</tr>
<tr>
<td>Case 3, Steffen et al</td>
<td>39</td>
</tr>
<tr>
<td>Case 4, Gallagher et al</td>
<td>67</td>
</tr>
</tbody>
</table>

Figure 1 | Presenting appearance of lesion clinical presentation. Persisting scleral thinning shown by arrowhead. |

Figure 2 | Histology of excised lesion. |

Figure 3 | Appearance post-incision. |

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that the lesions described by O’Brien represent variants of granuloma annulare, a disorder of skin and ocular adnexae. 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 inconspicuous palisading of epithelioid histiocytes.

McGræe postulated that actinic granuloma represented a cell mediated immune response to weakly antigenic determinants on actinic altered elastotic fibres with a predominance of helper T cells in the lymphocytic infiltrate.

More recently the association of temporal arteritis and actinic granulomas of the skin has been documented. 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. Gillot et al. 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 giant cell arteritis. This mode of autoimmune reaction complies with the “danger” model of autoimmunity described by Matzinger and appraised by Larkin.

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 granuloma includes pingueculitis, Bowen’s disease, conjunctival naevus, granuloma annulare (pseudorheumatoid nodule), and episcleral rheumatoid nodule.

Pathologically, the differential diagnosis includes pingueculae, pingueculitis, infection—particularly fungal, parasitic, or mycobacterial—and foreign body reactions. However, there is no granulomatous reaction to the actinic elastosis in pingueculae. In fungal and parasitic 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. Polarisable 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.

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References

Unilateral nasal hemianopia secondary to posterior subcapsular cataract

Visual field defects respecting the vertical midline are a common occurrence associated with focal neurological lesions. However, unilateral nasal hemianopias 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, 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. We report a case of a right unilateral nasal hemianopia resulting from central posterior subcapsular lens opacity.

Case report

A 51 year old woman treated for total 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 bimonidine eye drops to dorzolamide eye drops. At this 3 monthly review the patient...
gave a 1 month history of a sudden onset of misty vision affecting her right nasal visual field noticed while driving her car. There were no other associated neurological symptoms. Just before this she had been diagnosed with “borderline” systemic hypertension. 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 dropped from 6/6 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. Fluorescein angiography 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 inferotemporal excavation.

The visual field of the left eye was normal. Routine slit lamp biomicroscopy revealed marked central posterior subcapsular lens opacity with marked central posterior subcapsular lens opacity, a relatively normal visual field. A repeat red spot visual field revealed a complete reversal of the previously documented visual field. The left nasal hemianopsia respecting the scotoma on visual acuity: a simulation study. Optom Vis Sci. 1999;76:468-73.


Table 2 Characteristics of patients with pterygia and pinguecula

<table>
<thead>
<tr>
<th></th>
<th>Pterygium</th>
<th>Pinguecula</th>
</tr>
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<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] (range 55.5–82.3)</td>
<td>58.3 [7.4] (range 44.4–71.2)</td>
</tr>
<tr>
<td>Duration of lesion (years, mean (SE))</td>
<td>9.8 [3.7] (range 5.5–21.5)</td>
<td>18.1 [7.9] (range 10.0–28.5)</td>
</tr>
<tr>
<td>Conjointivitis history (%)</td>
<td>24 [36.9]</td>
<td>2 [8.7]</td>
</tr>
</tbody>
</table>

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 conjunctiva tested.

Comment

It has been proved that HPV possesses oncogenic potential and contributes to the development of various neoplastic 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 pterygia, 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


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

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. Moreover, in our previous study, we identified several patients who were homozygous for the FV Leiden mutation (Table 1). Both patients were male, and had ocular 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.

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

<table>
<thead>
<tr>
<th>BD patients (n=53)</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>28 (53%)</td>
</tr>
<tr>
<td>Female</td>
<td>25 (47%)</td>
</tr>
<tr>
<td>Ocular disease</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>39 (74%)</td>
</tr>
<tr>
<td>No</td>
<td>11 (21%)</td>
</tr>
<tr>
<td>HLA B*51</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>22 (42%)</td>
</tr>
<tr>
<td>Negative</td>
<td>31 (58%)</td>
</tr>
<tr>
<td>FV Leiden</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>2 (3.8%)</td>
</tr>
<tr>
<td>Negative</td>
<td>51 (96.2%)</td>
</tr>
<tr>
<td>Controls (n=100)</td>
<td></td>
</tr>
<tr>
<td>HLA B*51</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>6 (6%)</td>
</tr>
<tr>
<td>Negative</td>
<td>94 (94%)</td>
</tr>
<tr>
<td>FV Leiden</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>5 (5%)</td>
</tr>
<tr>
<td>Negative</td>
<td>95 (95%)</td>
</tr>
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</table>
patients, but not in other ethnic groups of patients, probably because this haplotype is rarely found in non-Far East Asians. There are several other factor V gene polymorphisms that may be involved in white patients and these could be an area for future study.

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 associating with the disease in different ethnic groups. It may not be possible to identify genes involved in severity of a complex disease such as Behçet's disease, which will hold across different patient populations.

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References

Localised corneal amyloidosis associated with herpetic keratitis

Amyloid diseases are secondary protein structure diseases in which insoluble protein fibrils accumulate extracellularly. Twenty different types of fibrils have been described in human amyloid, 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 latticelike deposits, which are classified in to five types based on the anatomic location.

Primary familial amyloidosis rarely affects the eye, although a case of conjunctival amyloidosis has been reported in a patient with rheumatoid arthritis.

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.

Primary familial amyloidosis, which presents as nodular white subepithelial protuberances in the central cornea, has been postulated to be autosomal recessive. In secondary localised corneal amyloidosis, the material is supposed as a result of chronic inflammation and irritation from scarred lids from trachoma, trichiasis, or long standing corneal scars.

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%). 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.

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References

Bilateral macular staphylomas in a patient with cone dystrophy

A posterior staphyloma is characterised by scleral ectasia and is pathognomonic for pathological myopia. Bilateral staphylomas are classified in five types based on the anatomic location.

Type 1 staphylomas extend from the nasal border of the optic nerve into the macular region and are the most frequent staphyloma seen in myopes.

Type 2 staphylomas are centred on the macula whilst type 3 staphylomas are centred on the optic nerve. Both types 2 and 3 staphylomas result in severe visual loss.
Figure 2  [A] and (B) Goldmann visual fields in both eyes demonstrate central scotomas with peripheral isoptres full to II-4 stimulus in the right eye (bottom right) and I-4 stimulus in the left eye (bottom left).

Figure 1  [A] and (B) Bilateral macular staphylomas in a patient with cone dystrophy. There are macular retinal pigment epithelial changes consistent with cone dystrophy. The retinal vessels in both eyes appear to dive posteriorly into staphylomas that are centred around the macula (type 2 staphyloma).

disc without macular extension. Type 4 staphylomas are located nasal to the optic disc and type 5 staphylomas develop inferior to the optic disc. Staphylomas can be associated with multiple complications including retinal pigment epithelial atrophy, lacquer cracks, retinal and subretinal haemorrhages, and choroidal neovascularisation.

This report describes a patient with undiagnosed, bilateral type 2 macular staphylomas compounded by cone dystrophy. To the best of our knowledge, this is a novel association not reported in the literature and with potential therapeutic implications.

Case report
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.

On ophthalmological examination, her uncorrected visual acuity was 20/200-2 in the right eye and 20/200-1 in the left eye. Retinoscopic reflex and refraction were variable and significant for mild myopia. Refraction did not improve her vision. There was no relative afferent pupillary defect and extraocular movements were normal. There was no evidence of nyctagmus. Slit lamp biomicroscopy of the anterior segment was unremarkable. Dilated fundus examination showed a tilted optic nerve head in each eye. There were bilateral macular retinal pigment epithelial changes consisting of a ring of hypopigmentation surrounding an area of mildly increased pigmentation centrally (Fig 1). The retinal vessels in each eye appeared to dive into posterior staphylomas (Fig 1). The staphylomas were centred around the macula in each eye. The peripheral retina in each eye was otherwise normal.

Fluorescein angiography demonstrated mottled hyperfluorescence without leakage corresponding to the retinal pigment epithelium (RPE) changes (data not shown). Goldmann visual fields were remarkable for central scotomas in both eyes with peripheral isoptres full to II-4 stimulus in the right eye and I-4 stimulus in the left eye (Fig 2). A B-scan showed bilateral staphylomas with macular involvement (Fig 3). On electroretinography, photopic responses were markedly reduced. The dim scotopic responses were normal. The mixed scotopic responses were 90% of normal in the right eye and 97% of normal in the left eye. There were markedly reduced photopic flash and flicker responses, with a questionable response of 10% of the normal amplitude. Pelli-Robson contrast sensitivity testing was depressed at 1.2 log units in a dim environment (normal = 1.65). D15 colour testing detected four major and two minor errors in the right eye, and five major and two minor errors in the left eye. A therapeutic red tinted contact lens was prescribed to eliminate the photophobia and aversion to light due to cone dystrophy, and thereby to reduce the level of visual dysfunction. After 1 month of wear, the patient reported being a lot more comfortable in bright surroundings. She did not have to squint as much as before using these lenses, was able to sustain prolonged eye contact with other individuals, had improved face recognition and demonstrated improved posture. Visual acuity was 20/125 in each eye tested separately and 20/80-2 when both eyes were tested together.

Comment
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 nyctagmus and the history of progressively worsening vision. Although there is a report of familial cone dystrophy with bilateral macular colobomata, 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.

Financial support: None.

References


Bloody tears, or haemolacria, 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 one 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.

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References:


Haemorrhagic toxoplasplasmic retinochoroiditis: description of an unusual clinical presentation

Toxoplasplasmic retinochoroiditis (TRC) is an infectious disease caused by the protozoan Toxoplasma gondii. This infection affects many organs including the eyes. Most of the time ocular involvement occurs as a transoperalional 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 chorioteral scar. A vitreous inflammation is usually present and occasionally vasculitis is observed.

We report the case of a healthy patient who developed a unilateral haemorrhagic retinochoroiditis (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 20/20 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.

Intraocular pressure was within the normal limits in both eyes. Left eye fundus examination showed a vitreous inflammation (cells: + + +) and a whitish retinochoroidal 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 cell count. Serological tests for Borrelia burgdorferi, Treponema pallidum, and HIV were normal. An acute inflammatory reaction was suspected and we decided to perform an anterior chamber tap. Polymerase chain reaction (PCR) (toxoplasma, CMV, HSV, VZV) gave negative results, but the Goldmann-Wittemter coefficient was 13.64 (reference range < 4), revealing a local production of anti-toxoplasplasmic 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 considered. 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 chorioteral scar with hard exudates located around the fovea. Kyrieiellis’s plaque were 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+ lymphocytes count, C3-C4, and CH50).

Comment

The most classic clinical presentation of an active toxoplasplasmic lesion is that of a whitish and oedematous necrotising RC close to an old pigmented scar. A severe vitreous...
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 military retinitis.

Ocular occlusive vasculitis can be observed 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 scans because of a prenatal history of intrauterine growth retardation with suspicion of a single kidney. Ocular examination revealed total left aphakia 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 aphakia 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. Intraocular pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but since digital pressures were normal but 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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
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 diarrhoea, 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 happened, 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 systemic concentration. Although we feel dorzolamide is a relatively safe topical antihypertensive treatment, this case underlines the need for caution when treating neonates.

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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 intrastral 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 eye drops (amikacin, vancomycin) and topical rifampicin. Topical antibiotic therapy was gradually tapered over 12 months. Topical dexamethasone was withdrawn and topical cyclosporin was used to maintain an immunosuppression. Despite intensive treatment with appropriate antibiotics, ICK increased in size and evolved simultaneously towards abscess and acute rejection. 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, cyclosporin, and rifampicin 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 multiple opacities merged into a large confluent dense opacity near the continuous suture (Fig 2). Cytological studies and cultures of the corneal 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 negative. Topical amphotericin B was started every hour, along with oral fluconazole. Corticosteroids were stopped and topical ciclosporin and fungal drugs. Moreover, immunosuppression (that is, corticosteroids, ciclosporin), necessary to prevent graft rejection, worsened the infection and did not prevent the acute rejection 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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Accepted for publication 2 February 2003

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 characterised by an indolent infectious keratitis in which needle-like, branching crystalline opacities are seen within the corneal stroma, in the absence of appreciable corneal or anterior segment inflammation.1 We report an unusual case of recurrent ICK which occurred in two successive corneal grafts.

Figure 1 Infectious crystalline keratopathy due to Streptococcus viridans in the first corneal graft. Except for a small erosion over the central area of the lesion, the corneal epithelium was intact. There was no corneal, limbal, or anterior chamber inflammation.

Figure 2 Slit lamp photography showing a large central epithelial defect with multiple diffuse white opacities due to Candida albicans in the second corneal graft. The remaining graft was clear. There were no signs of ocular inflammation and no symptoms.
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 Victoria 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 antiactyl choline receptor antibodies were also negative. A computed tomography (CT) scan of the orbit was performed which showed an extracranal 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 the 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, hyperchromatic 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. Special stains for micro-organisms were negative. Immuno-histochemical 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 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.

Table 1. Orbital histiocytic proliferations

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
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<td>Secondary to</td>
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<tr>
<td></td>
<td>ruptured cyst or trauma</td>
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<tr>
<td>Sinus histiocytosis with</td>
<td>Massive lymphadenopathy</td>
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<tr>
<td>Necrobiotic xanthogranuloma</td>
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<tr>
<td>Erdheim-Chester disease</td>
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<tr>
<td>Juvenile and adult xanthogranuloma</td>
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<td>Langerhan's cell histiocytosis</td>
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<tr>
<td>Familial haemophagocytic lymphohistiocytosis</td>
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<td>True histiocytic lymphoma</td>
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Figure 1 Sinus histiocytosis. A lymphoid infiltrate surrounding scattered large histiocytic cells containing phagocytosed intracytoplasmic lymphocytes (arrows) is seen. Original magnification x200.

In one report of SHML, uveitis with papilloedema was the only presentation and in another report the only site of the lesion was lacrimal sac with the duct but these patients later developed cervical lymphadenopathy. Another case with ocular involvement was reported with uveitis and marginal corneal infiltrates in association with cervical lymphadenopathy. SHML is usually benign, low grade, and self limiting but death has been infrequently attributed to it. The condition has also been occasionally associated with the development of malignant lymphoma. Hodgkin’s and the follicular type of non-Hodgkin’s lymphoma and SHML have been identified in the same lymph node biopsy specimen. SHML may be associated with fever, leucocytosis, elevated erythrocyte sedimentation rate, and hypergammaglobulinaemia. Some studies suggest that human herpes virus (HHV-6) may play a part in the pathogenesis of SHML.

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.

NOTICES

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...
please contact: Journal of Community Eye Health, International Resource Centre, International Centre for Eye Health, Department of Infectious and Tropical Diseases, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK (tel: +44 (0)207 762 7964; email: Ana.ToShah@lshtm.ac.uk; website: www.jchc.co.uk). Annual subscription (4 issues) £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)207 7323 0638; email: Adrienne.Burrough@lshtm.ac.uk; website: www.lshtm.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’s website (www.secondsight.org.uk) or by contacting Dr Lucy Mathen (lucymathen@yahoo.com).

Specific Eye Conditions 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)1280 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)1280 821 334; email: info@brps.demon.co.uk; website: www.brps.demon.co.uk).

Surgical Eye Experiments 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 benefiting from a corneal 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 A65/26) and urged Member States to develop national plans to increase public awareness and to support the work of national coordinating committees. The WHA also urged the Director-General to support 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 £3999 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 Allan 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@eyeanaesthesia.org; website: www.eyeanaesthesia.org).

Glaucome Society 24th Annual Meeting and Dinner

The Glaucome 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: glauсос@ukeire.freeserve.co.uk).

Detachment Course with international faculty on: Retinal 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: labbafi@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/sopt/interest.htm. Further details: ISOPT Secretariat (website: www.kenes.com/sopt).

XVth Meeting of the International Neuro-Ophthalmology Society

The XVth Meeting of the International Neuro-Ophthalmology Society will take place 18–22 July 2004, in Geneva, Switzerland. Further details: Prof. A Safran, University Hospital Geneva, c/o SYMOPOR SA, Geneva (fax: +4122 839 8484; email: info@symoporg.ch; website: www.symoporg.ch).