LETTERS

Laser induced chorioretinal venous anastomosis in ischaemic central retinal vein occlusion

Laser induced chorioretinal 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 fluorescein angiography (FFA), according to the criteria in the CRVO study. Approval from the ethics committee and informed consent from patients were obtained. Inclusion and exclusion criteria are shown in Table 1. All the laser treatment was performed by one of the authors (AK) who had successfully treated patients with non-ischaemic CRVO with a similar procedure. The site for attempts at the creation of anastomosis was in the inferotemporal and superonasal retina over a venous tributary of the retinal vein where it crosses over an underlying choroidal vein, at least 3 disc diameters away from the optic disc. Argon or diode laser with 50 µm spot size of 0.1–0.2 second’s duration and with a power level of 1.5–2.5 W was focused over the edge of the chosen retinal vein. Increasing power was used until there was haemorrhaging from the vein (Fig 1A). The bleeding was stopped by pressure on the eye with a contact lens.

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). Each eye was divided into matched pair for each anastomosis attempt. The number of attempted anastomosis 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 neovascular glaucoma.

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.

Table 1

<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</td>
<td>6 Presence of neovascularisation of the study eye (iris, angle, retina, disc)</td>
</tr>
<tr>
<td>7 Heparin/warfarin sodium cannot be discontinued for duration of study</td>
<td>7 Vitreous haemorrhage other than breakthrough in study eye</td>
</tr>
<tr>
<td>8 Impossible to differentiate between ischaemic and non-ischaemic central retinal vein occlusion</td>
<td>8 Intercurrent eye disease of study eye that is likely to affect visual acuity over study period</td>
</tr>
</tbody>
</table>

Table 2

<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>Total 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></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></td>
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<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></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></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></td>
</tr>
</tbody>
</table>

CRVO = central retinal vein occlusion, BCVA = best corrected visual acuity.
Figure 1 Presenting appearance of lesion: scleral thinning shown by arrowhead.

Figure 2 Histology of excised lesion.

Figure 3 Appearance post-incision: Persisting scleral thinning shown by arrowhead.

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 pingo de lue 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 lumpectomy for breast carcinoma 10 years previously. She had no significant family history and otherwise was generally well.

Ocular examination demonstrated a 3 × 3 mm, raised, flesh coloured, vascularised lesion on the right nasal bulbar conjunctiva with an associated corneal dellen (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 pingo de lue with granulomatous features suggestive of actinic granuloma (Fig 2).

Investigations into the cause of the underlying foci of atrophy included full blood count, erythrocyte sedimentation rate, serum VDRL, serum complement, anti- and anti- 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 apparently 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 pads 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 1 | Review of previously published cases of actinic granuloma |
|---|---|---|---|---|
| Patient age (years) | Sex | Location | Size of lesion | Clinical presentation | Differential diagnosis |
| Case 1, Proia et al | 38 | Female | Temporal bulbar conjunctiva | 2 mm | 3/52 History of painless red eye | Vascularised pingo de lue |
| Case 2, Ferry et al | 30 | Female | Temporal bulbar conjunctiva | 2 × 3 mm | 6/52 History of red eye | Pingo de lue, contact lens reaction, conjunctival naevus |
| Case 3, Steffen et al | 39 | Female | Conjunctiva, site unknown | Not known | Not known | Pingo de lue, Bowen’s disease |
| Case 4, Gallagher et al | 67 | Female | Nasal bulbar conjunctiva | 3 × 3 mm | 3/52 History of painless red eye | Bowen’s disease, breast metastasis |
that the lesions described by O'Brien represented 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.

McGrae postulated that actinic granuloma represented a cellmediated immune response to differentiated and altered elastotic fibres with a predominance of helper T cells in the lymphohistiocytic 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 as appear in the actual lesions of actinic granuloma and 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 (pseudoeudeforhniomatoid nodule), and episceral 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. 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.

M J Gallagher, F Roberts, S Osborne, C M Kirkness
Tennent Institute of Ophthalmology, Gartnavel General Hospital, Great Western Road, Glasgow G12 0YN, UK
Correspondence to: Stuart A Osborne, Tennent Institute of Ophthalmology, Gartnavel General Hospital, Great Western Road, Glasgow G12 0YN, UK; stozzie@hotmail.com

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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, 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 hemianopsia resulting from central posterior subcapsular lens opacities.

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 bimonodine eye drops to dorzolamide eye drops. At this 3 monthly review the patient

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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give 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. Confrontation visual field demonstrated a nasal 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 equal with normal reactions to light and accommodation. The right nasal hemianopia respecting the vertical midline was confirmed on a clinically reliable Humphrey 24-2 plot with a change in 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 conventional 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 repeated red dot visual field test still 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 placed produce generalised reduction in the visual field. In the previous three reported cases all the cataracts were posterior subcapsular in nature.

Our case is unusual in that the cataract was removed by phacoemulsification with an uncomplicated course. Further, the patient was not diabetic and other risk factors for a vascular event were absent, although there is a positive family history—her father had had a cerebrovascular accident. 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.

Material and methods

Samples were obtained from consecutive patients treated at the ophthalmologic clinic of the 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, pingueculas, or conjunctival tissues) were stored at -70°C.

DNA preparation

The DNA from specimens was isolated as described previously. Briefly, the lysis buffer (10 mM TRIS-HCl, pH 7.5, 1 mM EDTA, pH 7.9, 0.5% SDS) and the proteinase 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 distilled 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.

PCR analysis for HPV

Each amplification reaction was carried out in a total volume of 20 µl overlaid with one drop of mineral oil and contained 10 mM TRIS-HCl (pH 8.3), 50 mM KCl, 0.25 U Taq DNA-polymerase (Perkin-Elmer), and 100–200 ng DNA. The concentration of dNTPs and MgCl2 varied with each set of primers. Each PCR was carried out in DNA thermal cycler (Perkin-Elmer Cetus DNA Thermal Cycler 480) with the first denaturation step at 92°C for 4 minutes and the final extension step at 72°C for 15 minutes. The conditions and the number of denaturation, annealing, and extension cycles were different with each set of primers.

Table 1 Consensus primer sequences for human papillomavirus DNA detection

<table>
<thead>
<tr>
<th>Primer</th>
<th>Sequence* (5'-3')</th>
</tr>
</thead>
<tbody>
<tr>
<td>MY11</td>
<td>GCCMCAGGGGCTAATAAATGG</td>
</tr>
<tr>
<td>MY09</td>
<td>CGTCMRRGACWACGTCATC</td>
</tr>
<tr>
<td>L1C1</td>
<td>CGTAAAACCTTTCCCTTTITTTT</td>
</tr>
<tr>
<td>L1C2-1</td>
<td>TACCCTAAATCTCGTTAGT</td>
</tr>
<tr>
<td>GP5</td>
<td>TTTTGACCTGCAGTTAGTAC</td>
</tr>
<tr>
<td>GP6</td>
<td>GAAAATAAATGTTAAACCTA</td>
</tr>
</tbody>
</table>

To control the quality of the isolated DNA internally, the 268 bp sequence of β globulin gene was amplified using PC04 (5′CAACTTCATCCACGTTCACC3′) primers, and GH20 (5′GAAGACCCAGGAAGGACGTAAC3′) 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 methods with the three different sets of primers were 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, 0.05 mM of each dNTP, 0.5 µM L1C1, and 0.25 µM L1C1-1 primers (Table 1). 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.

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 conjunctiva 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 (10–30 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.

Table 2

<table>
<thead>
<tr>
<th>Authors (year published)</th>
<th>No of specimens</th>
<th>Pterygium (type)</th>
<th>Method/primer</th>
<th>Positive rates</th>
<th>HPV types (negative)</th>
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<tbody>
<tr>
<td>Dolmatch et al (1996)</td>
<td>16</td>
<td>?</td>
<td>Immunohistochemical stain</td>
<td>100%</td>
<td>16 (6, 11, 18)</td>
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<tr>
<td>Dushku et al (1999)</td>
<td>13</td>
<td>P + R</td>
<td>My09/MY11</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Gallagher et al (2001)</td>
<td>10</td>
<td>P + R</td>
<td>MY09/MY11</td>
<td>50%</td>
<td>6, 11, 16</td>
</tr>
<tr>
<td>Chen et al (current study) (2002)</td>
<td>65</td>
<td>P</td>
<td>L1C1/L1C2-1, GP5/GP6</td>
<td>0</td>
<td>-</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 Gln<sup>506</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. 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.

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, unlike 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 who had ocular disease were collected from individuals attending the Behçet’s disease clinic at the Medical Eye Unit, St Thomas’ 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.

**Factor V Leiden analysis**

HLA typing and detection of the FV Leiden mutation was performed using PCR-SSP as previously described. The results were analysed by generating two by two contingency tables and statistical analysis was performed using $\chi^2$ test.

**Results**

Fifty three patients (28 males, 25 female) were analysed; 74% (n=39) had ocular disease, 11 had no ocular disease, and for three patients the ocular disease status was unknown. Of those patients with ocular disease, 54% (21/39) had retinal vein occlusion.

Twenty two of 53 (42%) were HLA-B*51 of whom 3/22 (14%) were B*5108, the remainder being B*5101 (Table 1).

Only 2/53 (3.8%) patients in this cohort of patients with Behçet’s disease were heterozygous 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.

There are several possibilities that could explain the difference between the two groups. Firstly, the presence of FV Leiden in the Middle Eastern population is particularly high (17%) and this may have accounted for the functional role of this molecule in retinal veinous 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 the 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 FV Leiden and severity of ocular disease in the patients.

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 phenotype 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 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

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

<table>
<thead>
<tr>
<th>Feature</th>
<th>BD Patients (n=53)</th>
<th>Healthy White Controls (n=100)</th>
</tr>
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<tr>
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<tr>
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<td>28 (53%)</td>
<td>51 (51%)</td>
</tr>
<tr>
<td>Female</td>
<td>25 (47%)</td>
<td>49 (49%)</td>
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<tr>
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<td></td>
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<tr>
<td>Yes</td>
<td>39 (74%)</td>
<td>82 (82%)</td>
</tr>
<tr>
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<td>11 (21%)</td>
<td>18 (18%)</td>
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<td>22 (42%)</td>
<td>35 (35%)</td>
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<tr>
<td>Negative</td>
<td>31 (58%)</td>
<td>45 (45%)</td>
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<tr>
<td><strong>FV Leiden</strong></td>
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<td></td>
</tr>
<tr>
<td>Positive</td>
<td>2 (3.8%)</td>
<td>6 (6%)</td>
</tr>
<tr>
<td>Negative</td>
<td>51 (96.2%)</td>
<td>94 (94%)</td>
</tr>
<tr>
<td><strong>Controls (n=100)</strong></td>
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<td><strong>HLA-B*51</strong></td>
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</tr>
<tr>
<td>Positive</td>
<td>6 (6%)</td>
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</tr>
<tr>
<td>Negative</td>
<td>94 (94%)</td>
<td>90 (90%)</td>
</tr>
<tr>
<td><strong>FV Leiden</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>5 (5%)</td>
<td>8 (8%)</td>
</tr>
<tr>
<td>Negative</td>
<td>95 (95%)</td>
<td>92 (92%)</td>
</tr>
</tbody>
</table>
patients, but not in ethnic groups as associating with herpetic keratitis.

Localised corneal amyloidosis

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.

Y Chen, M R Stanford, G R Wallace
Department of Ophthalmology, King’s College, London SE1 7EH, UK
R W Vaughan, E Kondeatis
Department of Tissue Typing, King’s College, London SE1 7EH, UK
F Fortune
Department of Oral Medicine, University of Leeds, Leeds, UK
Correspondence to: Dr Graham Wallace, Academic Unit of Ophthalmology, University of Birmingham, City Hospital, Dudley Road, Birmingham B18 7QG, UK. g.r.wallace@bham.ac.uk
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References

Localised corneal amyloidosis associated with herpetic keratitis

Amyloid diseases are secondary protein structure disease 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 lattice corneal dystrophy. Cases of localised corneal amyloidosis have been reported in literature but are quite rare. 1–4 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 opthalmoplegia, 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. 5

Staford 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. 6 Primary familial amyloidosis, which presents as nodular white subepithelial protuberances in the central cornea, has been postulated to be autosomal recessive. 7 In secondary localised corneal amyloidosis, the material is deposited as a result of chronic inflammation and irritation from scarred lids from trachoma, trichiasis, or long standing corneal scars. 8–10 To the best of our knowledge its association with herpetic keratitis has not been reported. 7

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%). 8 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. 7

D Tejwani, A Azuara-Blanco
Department of Ophthalmology Aberdeen Royal Infirmary, Grampian University Hospitals, UK
J MacKenzie
Department of Pathology
Correspondence to: Augusto Azaura-Blanco, The Eye Clinic, Aberdeen Royal Infirmary, Aberdeen AB25 2ZD, UK. aazblanco@aol.com
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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. 11 Posterior staphylomas are classified into five types based on the anatomical location. 1 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. 2 Type 2 staphylomas are centred on the macula while type 3 staphylomas are centred on the optic

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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 3  (A) Horizontal B-scan ultrasound of the right eye. The depth and width of the macular staphyloma is 1.3 mm and 4.6 mm respectively. (B) Horizontal B-scan ultrasound of the left eye. The depth and width of the macular staphyloma is 1.0 mm and 4.2 mm respectively.

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 papillary defect and extraocular movements were normal. There was no evidence of nystagmus. 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 three 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 nystagmus and the history of progressively worsening vision. Although there is a report of familial cone dystrophy with bilateral macular colobomata, 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.

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R S Apte, J S Sunness
The Retinal Vascular Center, The Wilmer Ophthalmological Institute, The Johns Hopkins University School of Medicine, Baltimore, MD, USA

R S Apte, B G Goldstein
The Vitreoretinal Division
W L Park, J S Sunness
Lions Vision Center
R Z Roden, M J Elman
Elman Retina Group, PA, Baltimore, MD, USA

Correspondence to: Janet S Sunness, MD, The Wilmer Ophthalmological Institute, The Johns Hopkins University School of Medicine, 550 N Broadway, 6th Floor, Baltimore, MD 21205, USA; jsunness@jhmi.edu

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References

Bloody tears, or haemolacria, are an occasional feature of hereditary haemorrhagic telangiectasia,1 and tumours of the lacrimal apparatus.2 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,1 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 retrogradely 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.

M F Wiese
Department of Emergency Medicine, King’s College Hospital, Denmark Hill, London SE5 9RS, UK; wiese@doctors.org.uk

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References:

Haemorrhagic toxoplasmic retinocochroiditis: description of an unusual clinical presentation

Toxoplasmic retinocochroiditis (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 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 choriretinal scar. A vitreous inflammation is usually present and occasionally vasculitis is observed.1

We report the case of a healthy patient who developed a unilateral haemorrhagic retinocochroiditis (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. Intracocular 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 preretinal 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-CD8 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 choriretinal 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-CD8 lymphocyte counts, C3-C4, and CH50).

Comment
The most classic clinical presentation of an active toxoplasmic 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 protozoans was described by Zimmermann in 1996. 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 Behçet’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.

E Baglivo, A B Safran
Clinique d’Ophtalmologie, Hôpitaux Universitaires de Genève, Rue Alcide-Jenster, 22-CH-05 Geneva, Switzerland

Correspondence to: Edoardo Baglivo, MD, Clinique d’Ophtalmologie, rue Alcide-Jenster, 22, CH-1205 Geneva, Switzerland; Edoardo.Baglivo@hcuge.ch

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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 necessitating 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 neurological examination, weight and length at birth, 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 swelling. 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-II 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

Figure 1 Trend in metabolic acidosis over time.

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, Po2, 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, fluocloxacillin, 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).

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Figure 2 Fundus of the left eye (3 months after treatment). Regression of the haemorrhages. Presence of a whitish retinochoroidal scar with hard exudates around the fovea. Kyrieleis’s plaques are observed along the inferior papillary arterial vessel.
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.

S Morris, V Geh, K K Nischal
Department of Ophthalmology, Great Ormond Street Hospital for Children, London WC1N 3JH, UK

S Morris, V Geh, K K Nischal
Visual Science Unit, Institute of Child Health, London, UK

S Sahi, M A S Ahmed
Department of Paediatrics, King George Hospital, Barnley Lane, Ilford, IG3 8YB, UK

Correspondence to: Mr Ken K Nischal, Department of Ophthalmology, Great Ormond Street Hospital for Children, London WC1N 3JH; UK; kkn@binternet.com

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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 recurrent 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.

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 eye drops (amikacin, vancomycin) and topical rifamicyn. 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 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 multiple opacities merged into a larger confluent opacification and serum electrolytes in the absence of diarrhea, 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.

S Morris, V Geh, K K Nischal
Department of Ophthalmology, Great Ormond Street Hospital for Children, London WC1N 3JH, UK

S Morris, V Geh, K K Nischal
Visual Science Unit, Institute of Child Health, London, UK

S Sahi, M A S Ahmed
Department of Paediatrics, King George Hospital, Barnley Lane, Ilford, IG3 8YB, UK

Correspondence to: Mr Ken K Nischal, Department of Ophthalmology, Great Ormond Street Hospital for Children, London WC1N 3JH; UK; kkn@binternet.com

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S Morris, V Geh, K K Nischal
Department of Ophthalmology, Great Ormond Street Hospital for Children, London WC1N 3JH, UK

S Morris, V Geh, K K Nischal
Visual Science Unit, Institute of Child Health, London, UK

S Sahi, M A S Ahmed
Department of Paediatrics, King George Hospital, Barnley Lane, Ilford, IG3 8YB, UK

Correspondence to: Mr Ken K Nischal, Department of Ophthalmology, Great Ormond Street Hospital for Children, London WC1N 3JH; UK; kkn@binternet.com

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References
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 eyeball 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 anticyt choline receptor antibodies were also negative. A computed tomograph (CT) scan of the orbit was performed which showed an extransoral 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. Histolological 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, hyperchromatic nuclei with vesicular chromatin and abundant eosinophilic, foamy or clear cytoplasm with poorly defined cell borders. Empiricoplasis 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 uncommon 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.

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 type 6 (HHV-6) may play a part in pathogenesis of SHML. HHV-6 which infects many in childhood and remains latent in host cells can be reactivated by immunodeficiency. Serological evidence of HHV-6 and Epstein-Barr virus infection have also been documented in patients with SHML with their presence in affected tissues as well. SHML is usually self limiting but in some cases there was orbital involvement with compressive optic neuropathy, persistent uveitis with marginal corneal infiltrates, massive lymphadenopathy impairing cervical perfusion, 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.16 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.

The authors wish to correct an error in the article: A Comparison of Perimetric Results with Medmont and Humphrey Perimeters. (Br Ophthalmol 2003; 87:690-4). 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.

Table 1: Orbital histiocytic proliferations

| Secondary to ruptured cyst or trauma |
| Sinus histiocytosis with massive lymphadenopathy |
| Nacrobiotic xanthogranuloma |
| Erdheim-Chester disease |
| Juvenile and adult xanthogranuloma |
| Langerhan’s cell histiocytosis |
| Familial haemophagocytic lymphohistiocytosis |
| True histiocytic lymphoma |

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)20 7612 7964; email: Anita.Shah@lshtm.ac.uk; website: www.jcch.co.uk). Annual subscription (4 issues) UK£28/US$45. Free to developing country applicants.

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.secondsightsight.org.uk) or by contacting Dr Lucy Mathen (lucy.mathen@yahoo.com).

SPecific Eye Conditions (SPECS)
Specific Eye Conditions (SPECS) is a not for profit organisation which acts as an umbrella organisation for support groups of any conditions or syndrome with an integral eye disorder. SPECS represents over 50 different organisations related to eye disorders ranging from very rare syndromes that are relatively common to very rare syndromes. The website acts as a portal giving direct access to support groups on their 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 primary aims of BRPS are to raise funds to support the programme of medical research into an eventual cure for this very rare syndrome. The website acts as a portal giving direct access to support groups on their 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).

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 (doc A56/20) to take steps for 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 non-members £473; students £30. 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).

Gliaoma Society 24th Annual Meeting and Dinner
The Glaucoma 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: glaouoc@ukiere.freererve.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 Siyamak 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/isopt/interest.htm. Further details: ISOPT Secretariat (website: www.kenes.com/isopt).

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 SYMPORG SA, Geneva (fax: +4122 839 4848; email: info@symprop.ch; website: www.symprop.ch).