LETTERS TO THE EDITOR

Viridans group Streptococcus subretinal abscess

EDITOR,—Subretinal abscess is an unusual entity, occurring primarily in immunocompromised individuals. Reported causative organisms include fungi and Gram negative rods. Here we report a subretinal infection resulting from the Gram positive organism viridans group Streptococcus in a pancytopenic patient.

CASE REPORT
A 56 year old man undergoing chemotherapy for IgG multiple myeloma presented with 3 days of fever. He denied injecting drug abuse. He had a temperature of 101.5°F, poor dentition, a quiet indwelling catheter site on the chest, and no cardiac murmur. He was pancytopenic with a haematocrit of 14.2% (normal 39–49%), white blood cell count of 0.2 x 10⁹/l (normal 4.5–11.0), absolute neutrophil count of 0.1 x 10⁹/l (normal 1.8–6.8), and platelet count of 12 x 10⁹/l (normal 150–450). Chest x ray and urinalysis were clear. Empirical treatment with intravenous vancomycin and ceftazidime was initiated.

The next day the patient reported decreased vision in the left eye. Visual acuity in the right eye was 20/25 and light perception in the left. The anterior segments were clear. Several cotton wool spots and blot intraretinal haemorrhages were present in the right eye. In the left eye, yellow white subretinal exudate was observed detaching two thirds of the retina; the vitreous was clear. Vitreous tap was unsuccessful. Since blood cultures had grown Gram positive cocci in pairs and chains that were subsequently identified as viridans group Streptococcus sensitive to penicillin and vancomycin, the left eye was injected intravitreally with vancomycin 1.0 mg/0.1 ml. Despite two further intravitreal injections of vancomycin, the patient’s left eye rapidly lost light perception and developed increasing vitreous haze (Fig 1). Repeat vitreous tap revealed Gram positive cocci in pairs and chains, although cultures grew no organisms.

The patient remained febrile and his mental status declined during treatment for presumed bacterial endocarditis. (He was too ill to undergo transoesophageal echocardiography.) Head computed tomogram revealed multiple brain lesions consistent with septic emboli. On day 10, the left eye was eviscerated and the indwelling catheter removed because of concern these foci might represent persistent infectious reservoirs. The patient died of sepsis on day 16. Family members declined necropsy.

Histopathological examination of the evisceration specimen revealed Gram positive cocci in clusters and individually in the retina with an underlying protein exudate, coagulative necrosis of the inner retina, fibrinous occlusion of some retinal blood vessels, and numerous clumps and individual Gram positive cocci in the subretinal space and inner retina (Fig 2). Inflammatory cells were strikingly absent.

COMMENT
Viridans group Streptococcus (VGS) is a normal constituent of the oral flora. VGS is the leading cause of native valve endocarditis in non-injecting drug abusers and is also an increasing problem in neutropenic cancer patients. In adults undergoing chemotherapy for cancer up to 30% of bacteraemias result from VGS, with mortality rates of up to 30%. The most common source of VGS bacteraemia is the oropharynx.

Treatment guidelines for subretinal abscess are unclear. Although one of the most feared complications of vitrectomy surgery for endophthalmitis is retinal break leading to retinal detachment, successful vitrectomy with internal drainage has been described. We did not pursue vitrectomy surgery because a causative organism was identified, the vitreous was initially clear, and the patient was moribund. In retrospect, the absence of an inflammatory cell response in the retina (Fig 2), presumably because of severe pancytopenia, suggests sterilisation of the eye by any means would have been extremely difficult if not impossible.

The clinical picture of our patient was that of subretinal abscess. The absence of inflammatory cells in the pathological specimen, however, defines the subretinal exudate as non-purulent and primarily proteinaceous in nature.

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Figure 1 Fundus photograph on hospital day 4. Left eye exhibits subretinal exudative material detaching two thirds of the retina. The arrow indicates the optic disc.

Figure 2 Histological sections of evisceration specimen. (A) Haematoxylin and eosin stain (×40) reveals coagulative necrosis of the inner retina. Arrow indicates outer nuclear layer. Asterisk indicates Gram positive cocci in clusters and individually in the inner retina (arrow) and the subretinal space.
considered to be a safe procedure with little
medical problems, was on no medication, but
had a family history of retinal detachment.
She had had bilateral inferior oblique myecto-
omy 6 years earlier. Her acuity improved to
6/6 bilaterally when the vitreous haemorrhage
had cleared 4 months later but she was left
with bilateral scotomas. There was evidence of
anomalous vessels in the large scar in the left
eye but no leakage was seen on fluorescein
angiography (Fig 1, bottom). These vessels
have not been treated with laser therapy but
are being observed regularly in clinic. She had
normal pupillary responses to light. The
surgeon who performed the inferior oblique
myectomy was contacted and confirmed that
it was their normal practice to use monopolar
diathermy to cut the muscle during this type of
surgery.

COMMENT
Monopolar diathermy works by forming an
electrical current from the indifferent elec-
trode plate (usually attached to the patient's
thigh) to the forceps or blade held by the sur-
geon. Current flows through the body creating
thermal damage in the tissues near the forceps
or knife resulting in coagulation. There have
been case reports of current flowing in this
way causing unexpected damage proximal to
the forceps particularly when operating on
vascular structures in which a lot of current
must flow through a small amount of tissue.
This situation has occurred during circum-
cision operations and in some cases total abla-
tion of the penis has resulted. Similar damage
may occur during bowel surgery resulting in
pedicle injury. Current flows particularly well
through blood vessels which means that
vascular structures are at particularly high risk
of damage from this mechanism. Bipolar dia-
thermy is generally speaking a much safer way
to perform surgery as there is no current flow
between the tips of the diathermy forceps rather
than through the rest of the patient. This
makes collateral damage much less likely to
occur.
The normal insertion of the inferior oblique
muscle is oblique with the convexity upwards
and is predominantly below the horizontal
meridian, with which it may make an angle of
from 15° to 20°. The main variation in
insertion is in the degree of obliquity and con-
vexity of the curve but the insertion may often
show gross irregularities such as angular
serrations or dehiscences (Fig 2). The inser-
tion is usually between 8 and 10 mm long.
The macula is usually 1–2 mm posterior and 1
mm superior to the tip of the inferior oblique
insertion. At first sight our patient's scars do not seem to directly corres-
pond to this position there are a number of
possible explanations. Firstly, this patient
required vertical squint surgery so it is
possible that her inferior oblique muscles did
not have a normal site of insertion. Another
factor might be the angle of traction on the
muscle when the diathermy was being ap-
plied. The forward pull on the muscle would
have brought it into close contact with the
globe along some of its length anteriorly and
this may have resulted in thermal damage at
the peripheral site of the scarring. Finally, there
are other structures in close proximity to the
muscles such as blood vessels (vortex veins),
nerves, and their accompanying fibrous tissue
all of which could have played a part in
conducting current and causing a burn. The
muscle belly where diathermy is applied has a
larger cross sectional area than the insertion or
place of approximation of the tendon to the
lobe. This results in a relatively large current
flowing through a small cross sectional area
which can easily result in a burn as it
sometimes does in circumcision surgery.

A variety of techniques are used for
cutting disinsertion, denervation, and recession.
Myotomy and denervation using cutting
diathermy has been described and in one
series of 86 patients who underwent thermo-
electric weakening there was no mention of
any visual complications. This procedure was
carried out using an "electric knife" but it is
not specified whether this was a monopolar or
dipolar device.

Internal ophthalmoplegia has been de-
scribed as a complication of inferior oblique
myectomy using what was probably bipolar
cautery and the most likely cause of this was
thought to be excessive stretching of the nerve
to the inferior oblique with secondary trauma
to the ciliary ganglion. In our case we believe
that the potential of the monopolar diathermy
to cause damage may have been exacerbated by
stretching the inferior oblique muscle while using the cutting
diathermy on it. This would have reduced the
cross sectional area causing greater resistance
to flow consequently generating more heat in
the muscle including its site of origin which is
usually in close proximity to the macula.
Although difficult to prove this we have no

Figure 1  Top: Bilateral retinal scars on presentation. Bottom: Fluorescein angiogram demonstrating bilateral macula burns.
other explanation for the development of bilateral symmetrical choriotreinal scars in this otherwise healthy young woman.

Monopolar electrocautery has been used successfully for many years by ophthalmologists particularly in the field of oculoplastics and should not be abandoned. However, we believe that monopolar diathermy should not be used during inferior oblique surgery as monopolar cutting seems to offer little advantage over the use of bipolar cautery and a conventional blade and has the potential to cause significant retinal injury.

**Figures**

1. **Figure 1** Juvenile xanthogranuloma of the iris. Left eye yellowish brown lesion with an irregular surface on the nasal side.

2. **Figure 2** Ultrasonic biomicroscopy of the juvenile xanthogranuloma lesion of the iris. Showing a free margin between the lesion and the angle; the ciliary body is not involved. Note the homogeneous reflectivity of the tumour mass.

3. **Figure 3** Cellular mass consisting of numerous histiocytes, a few lymphocytes, plasma cells, iris melanocytes, and Touton giant cells (arrow). Haematoxylin and eosin; original magnification ×120.

**References**


Ultrasound biomicroscopy in juvenile xanthogranuloma of the iris

**Editor,**—Juvenile xanthogranuloma (JXG) is a rare disorder of infants and very young children affecting the ocular structures, particularly the iris. It is characterized by spontaneous hyphaemia associated with a yellowish, poorly demarcated iris tumour and increased intraocular pressure; the aetiology is unknown.

The ocular lesions are usually unilateral and should be differentiated from amelanotic melanoma, iris leiomyoma, haemangioma, and other iris lesions. Early diagnosis and treatment determine the final visual outcome.

The aim of the present study was to describe the use of ultrasound biomicroscopy (UBM) to define precisely the location of the tumour before excision and to correlate the UBM findings with the histopathological pattern.

**CASE REPORT**

A 2 year old girl was evaluated for an iris lesion. Past medical history showed two events of febrile convulsions at 1 year of age. Computed tomography of the brain, electroencephalography, and lumbar puncture were normal. Fixation and follow up movements were normal in both eyes. Ophthalmological examination revealed an unusual yellowish, brown stromal lesion with an irregular surface in the nasal side of the left iris (Fig 1). It occupied the whole iris, from the angle to the pupillary border. Abnormal vascularisation and a small hyphaema were also noted. Except for the iris lesion, the anterior and posterior segments were completely normal. The examination of the right eye was unremarkable. Systemic evaluation revealed normal findings.

On examination under anaesthesia, Tonopen tonometry revealed a pressure of 23 mm Hg, and microscopy showed a 3.4 mm × 4 mm mass located in the lower nasal quadrant between the 7 o’clock and 11 o’clock positions, with pupillary distortion. UBM was subsequently performed and a full thickness, solid stromal lesion of the iris was observed, with a homogeneous internal reflectivity and slightly irregular surface with no surface plaque. There was no involvement beyond the iris root. Lesion thickness measured 1.2 mm (Fig 2).

Sector iridectomy was performed in order to remove the whole lesion together with clinically normal looking temporal and nasal margins.

Viscoselectic material was used to prolapse the involved iris segment out of the eye through a wide limbal incision, and the iris was excised at the root. Histopathological evaluation revealed a cellular mass occupying the entire iris stroma and consisting of numerous histiocytes, some of them containing clear cytoplasmic vacuoles. Among these cells a few lymphocytes, plasma cells, and iris melanocytes were noted. Immunohistochemical staining for CD-68, a histiocytic marker, was positive in the majority of the histiocytic cells. Immunohistochemical staining for HMB-45, a melanoma cell marker, was negative. Touton giant cells were noted among the histiocytic cells (Fig 3). According to these histopathological findings a diagnosis of juvenile xanthogranuloma was made.

**COMMENT**

The present study shows the importance of preoperative UBM evaluation in identifying the nature and location of any iris lesion in childhood, before surgical excision is performed.

The homogeneous cellularity of the whole mass together with the absence of significant vascular channels on histology correlated with the homogeneous reflectivity on the UBM. The slightly irregular surface of the tumour and lack of vascular channels helps to differentiate JXG from iris melanoma, which generally show more variable internal reflectivity patterns including a linear more highly reflective pattern in the superficial layer and lobulated appearance with internal space representing blood vessels.

In our case, UBM was the major technique which allowed us to determine the characteristics, thickness, location, and possible spread of the lesion. By defining the precise boundaries of the lesion and ruling out involvement of the iridocorneal angle or ciliary body, UBM
A traumatic "peripheral iridotomy" protects against pigment dispersion and glaucoma

EDITOR,—Pigment dispersion syndrome is an autosomal dominant condition which leads to pigmentary glaucoma in up to 50% of cases. Campbell1 was the first to propose that posterior bowing of the peripheral iris with chasing angle recession could be responsible for the liberation of iris pigment which recent developments in high resolution ultrasound biomicroscopy appear to bear out. Current theories suggest that the cause of this posterior iris bowing is "reverse pupil block";2 in which the iris acts as a flap valve against the anterior surface of the lens allowing aqueous to pass from posterior to anterior chamber but not vice versa.

Pigment dispersion syndrome is a bilateral, symmetric disorder and unilaterality or asymmetry should prompt further investigation as to the cause.3 An unusual case of unilateral pigmentary glaucoma is presented which is the first to report the possible long term protective benefits of relieving of this "reverse pupil block".

CASE REPORT

A 59 year old man was referred after his optometrist had noted elevated intraocular pressure (IOP) in his right eye. He was myopic and had sustained a blunt injury to his left eye at the age of 8 after which the vision in that eye had been poor.

His corrected visual acuity was right eye 6/5 Snellen −1.25/−3.25×180 and left eye 6/4 Snellen −1.25/−1.50×175. IOPs at presentation were 35 mm Hg right and 20 mm Hg left. He had been seen deeply pigmented irides bilaterally. His right eye showed inferocentral pigment deposition on the corneal endothelium (Krukenberg's spindle) and mid-peripheral radial iris transillumination defects. The left cornea was clear and the only iris defects visible were a 2 clock hour iridodilatation and a partially denervated, ruptured iris sphincter muscle. Both anterior chambers appeared equally deep and gonioscopy revealed a wide open angle with a posteriorly inserted iris root in both eyes. In the left eye, on the borders of the dialysis only, there had probably been some iris recession. Heavy circumferential trabecular pigmentation was present in the right eye but no pigment was seen on the left. The right optic disc (Fig 1) was deeply cupped (vertical C/D 0.67) while the left optic disc (Fig 2) was not cupped but was slightly pale and surrounded by choriotereal scarring. Right eye threshold visual field examination was suggestive of a superior nasal step scotoma while the left showed an inferior altitudinal defect. A diagnosis of right pigmentary glaucoma was made and he was immediately started upon levobunolol twice daily in his right eye. Subsequently he has had a laser peripheral iridotomy performed.

COMMENT

Much in the same way as conventional pupil block can be alleviated by an iridotomy (providing an alternative aqueous pathway and equalising anterior and posterior chamber IOP), it is suggested that "reverse pupil block" may also be alleviated in the same way. There is now evidence that laser peripheral iridotomy in pigment dispersion syndrome both restores a more planar iris configuration4 and may prevent the development of ocular hypertension.5 However, long term studies are awaited.

This report illustrates the effect of a traumatic iridotomy occurring in childhood in an individual who was destined subsequently to develop pigment dispersion syndrome and glaucoma. It would appear that the lack of pigment dispersion and optic disc cupping in the previously damaged eye provides evidence for the long term efficacy of laser peripheral iridotomy in this condition.

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COMMENT
There are two possible mechanisms by which 5-FU may compromise cellular function. The first is inhibition of cell replication, and the second a toxic effect, either by direct drug action or an alkali effect (pH 8.9). Corneal endothelial cell toxicity has been reported in in vitro animal studies. However, the in vitro model does not allow for aqueous dilution, aqueous turnover, or aqueous pH buffer effects. In addition, corneal endothelial cells replicate in animal models, unlike their human counterparts. Direct and/or alkali toxicity is the more probable mechanism in the human cornea.

Two other cases of 5-FU gaining direct access to the anterior chamber have been reported in humans. The authors described the use of subconjunctival 5-FU (50 mg/ml) after a bleb needling procedure. Anterior chamber washout was not performed and severe corneal oedema developed at day 1 which resolved completely after 6 months. Increased endothelial cell pleomorphism was noted.

In our case report, the significant fall in intraocular pressure after injection suggests that the needle entered the bleb cyst, increased intracyst pressure, and enabled 5-FU to enter the anterior chamber.

The first and second specular micrograph findings indicate that the endothelium was relatively undamaged by 5-FU exposure, and the drop in cell count noted in the third micrograph is compatible with published reports of cell loss encountered after endocapsular cataract surgery. In conclusion, we did not experience clinically significant endothelial cell toxicity, presumably due to the dilution and pH buffering effects of aqueous, followed by prompt anterior chamber washout. As 5-FU is potentially toxic in the eye, our experience suggests that care should be taken when injecting around an encysted bleb.

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