

## Letters to the Editor

Sir—Subconjunctival injections of antibiotics are used increasingly at the conclusion of intraocular and extraocular procedures,<sup>1</sup> and intravitreal antibiotics are an established therapy for bacterial endophthalmitis.<sup>2</sup> Ocular toxicity of such drugs has been investigated in animal models,<sup>3,4</sup> and recent reports of the effects on the retina of inadvertent intraocular injection of gentamicin during intraocular surgery have given rise to concern.<sup>5,6</sup> We wish to draw attention to two cases of catastrophic visual loss presumed to be due to periocular injection of gentamicin.

### Case reports

#### Case 1.

In 1972 a 63-year-old woman had bilateral intracapsular cataract extractions but surgery on the left eye was complicated by an expulsive haemorrhage and the eye was enucleated. Six months after the extraction she had successful retinal reattachment surgery on the right eye. In October 1987 the silicone sponge became exposed and the conjunctiva was sutured over it. In February 1988 right vision was 6/18 but the eye continued to be uncomfortable so the wound area was explored for the purpose of removal of the exposed explant. However, scleral melting and choroidal exposure under the explant was noticed and the operation was abandoned for fear of ocular perforation. The conjunctiva was partially closed and the surgical field was 'soaked in gentamicin'; a subconjunctival injection of gentamicin (40 mg) was also administered in the opposite quadrant. On the first post-operative day, right vision was reduced to vague perception of light only and she was referred to Moorfields Eye Hospital for further management.

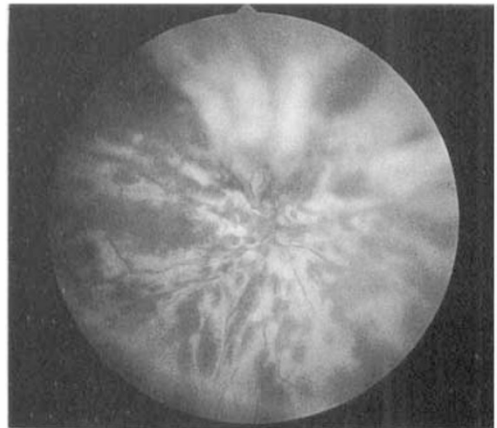
On examination the explant was exposed superonasally, the cornea was oedematous and the retina was totally detached with widespread intraretinal haemorrhages and no obvious retinal break. The following day the explant was removed revealing black uveal tissue spanning three quadrants. High dose systemic steroids were commenced but within two days she lost perception of light completely. The cornea cleared but the detachment persisted (Fig. 1) and the sclera slowly granulated. Six

months later the eye had developed rubeosis, a hyphaema and a dense vitreous haemorrhage.

#### Case 2.

A 34-year-old man with congenital nystagmus and high myopia underwent successful retinal reattachment surgery to the right eye in 1985. In September 1987 he developed a left retinal detachment not involving the macula; vision was 6/24. At surgery a retinal hole at the superonasal equator was treated with transcleral cryotherapy, and suturing of a radial sponge explant was associated with accidental drainage of subretinal fluid. At the conclusion of surgery subconjunctival gentamicin was injected 'in the region of the explant'. The following day left vision was counting fingers only and although the retina was reattached, the disc appeared swollen and there were intraretinal haemorrhages at the posterior pole. He was treated with high dose steroids but with no improvement in the visual acuity. Over the following three months he developed rapidly progressive lens opacities and was referred to Moorfields Eye Hospital.

A lensectomy and vitrectomy was performed and at surgery perivascular intraretinal haemorrhages, areas of retinal depigmentation and gross optic atrophy were noted. Despite careful internal searching, there was no sign of full thickness perforation of the ocular coats that might have arisen



Case 1. Right posterior fundus showing widespread retinal haemorrhages and exudative detachment.

from inadvertent intraocular injection of gentamicin. Six months after his initial retinal reattachment surgery visual acuity remained counting fingers but the intraretinal haemorrhages had resolved.

The value of periocular antibiotics is now well established and gentamicin is one of the commonest drugs used.<sup>1</sup> The toxic effects of gentamicin have been well documented in the animal model<sup>3,4</sup> and in humans;<sup>5,6</sup> toxicity depends on the dosage and the route of administration. Recently McDonald reported five cases of severe retinal ischaemia associated with gentamicin injection, in three of which massive doses of gentamicin had been inadvertently injected into the eye.<sup>5</sup> In each case the clinical picture was similar with intraretinal haemorrhages, retinal infarction and arteriolar narrowing in the early stages. Retinal pigmentary degeneration, optic atrophy, rubeosis iridis and neovascular glaucoma ensued. The similarity of the clinical picture in our patients suggests that gentamicin was the causative factor. However, we are not aware of exudative detachment (case 1) having been previously observed in cases of gentamicin toxicity. Baum and Peyman reported retinal haemorrhages in the same quadrant as periocular injection of gentamicin but without any of the other features of gentamicin toxicity.<sup>7</sup> In our first case there were large areas of exposed uveal tissue through which high concentrations of gentamicin might have diffused into the intraocular tissues and caused such profound effects. In case 2 gentamicin was injected in the region of a silastic sponge at the site of inadvertent sclerostomy and may have entered the eye through this route.

These cases suggest that care should be taken when administering potentially toxic antibiotics in the region of open wounds or near deficient sclera through which they might diffuse into the intraocular tissues. The possibility also exists that episcleral silastic sponges may act as a reservoir for drugs in these circumstances, increasing the danger of excessive intraocular penetration and toxicity.

Your sincerely,  
R. J. Morris FRCS, FCOphth  
D. McLeod FRCS, FCOphth  
Z. J. Gregor FRCS, FCOphth  
Moorfields Eye Hospital, City Road, London and  
University Department of Ophthalmology, Manchester Royal Eye Infirmary, Oxford Road, Manchester.

#### References

- Starr MB: Prophylactic antibiotics for ophthalmic surgery. *Surv Ophthalmol* 1983, **27**: 353-73.  
<sup>2</sup> Baum JL, Peyman GA, Barza M: Intravitreal administration of antibiotic in the treatment of endophthalmitis. *Surv Ophthalmol* 1982, **26**: 204-6.

- <sup>3</sup> Peyman GA, May DR, Ericson ES, Apple D: Intraocular injection of gentamicin: toxic effects and clearance. *Arch Ophthalmol* 1974, **92**: 42-7.  
<sup>4</sup> Conway BP, Tabatabay CA, Campochiaro PA, D'Amico DJ, Hanninen LA, Kenyon KR: Gentamicin toxicity in the primate retina. *Arch Ophthalmol* 1989, **107**: 107-12.  
<sup>5</sup> McDonald HR, Schatz H, Allen AW, Chenoweth RG, Cohen HB, Crawford JB, Klein R, May DR, Snider JD: Retinal toxicity secondary to intraocular gentamicin injection. *Ophthalmology* 1986, **93**: 871-7.  
<sup>6</sup> Snider JD, Cohen HB, Chenoweth RG: Acute ischaemic retinopathy secondary to intraocular injection of gentamicin. In Ryan SJ, Dawson AK, Little HL, eds. *Retinal Diseases*. Orlando FL: Grune and Stratton Inc. 1985, 227-32.  
<sup>7</sup> Baum JL, Peyman GA: Antibiotic administration in the treatment of endophthalmitis. *Surv Ophthalmol* 1977, **21**: 332-46.

**SIR**—A case is presented of a child born with the rare form of craniostenosis known as cloverleaf or Kleeblattschädel syndrome. Very severe bilateral proptosis occurred with complete dislocation of the globe on one side, due to extreme shallowing of the orbital fossae. Bilateral tarsorrhaphies were performed to protect the dislocated globe and prevent exposure to the other eye.

#### Case history

A four-day-old boy with the cloverleaf form of craniostenosis was referred by the Department of Paediatric Surgery for an urgent ophthalmological opinion. The mother was 37 years old with three other children: one healthy, one with Perthe's disease and one with Perthe's disease and a mild form of haemophilia. Normal delivery took place at full term with Apgar scores of eight at one minute and ten at five minutes.

The appearance at birth was essentially the same as when seen by the Eye Department. The child showed many features of the Kleeblattschädel syndrome with a cloverleaf shaped head, low set ears and bilateral syndactyly of second and third toes. There was complete dislocation of the left globe from the orbit, with the eyelids obscured by conjunctival chemosis. The right globe was proptosed to a lesser degree (Figs. 1-3). Both corneas showed epithelial loss and central corneal oedema. The pupils reacted to bright direct light. CT scans and skull X-rays showed hydrocephalus and shallow truncated orbits (Fig. 4).

#### Management

Bilateral medial and lateral tarsorrhaphies