



**Fig. 3.** Sectoral fragments of bamboo removed from the right orbit. Dimensions accord with the radiolucent area in Fig. 1. Scale in centimetres.

injury;<sup>6,10</sup> such injuries are much less common after lower eyelid perforations.<sup>3</sup>

Inspection of the traumatising object may reveal it to be recently broken or deficient in part. Organic material may disintegrate, resulting in multiple foreign bodies. By its porous organic nature and its frequent proximity to soil, wood is an ideal bacterial and fungal reservoir<sup>6</sup> and likely to provoke inflammation. A narrow deep wound track is conducive to the proliferation of anaerobic bacteria.

Diagnostic imaging should determine the presence and nature of foreign material and any associated bony or soft tissue injury. Organic material may be both radio- and sonolucent, and therefore indistinguishable from soft tissue or air in the orbit or cranial cavity. A wide variation in radiodensity may occur in a single piece of wood.<sup>6</sup> In an aqueous environment wood absorbs water, increasing its radiodensity towards that of soft tissue. Also, a structure which only partially occupies the volume of a CT slice is subject to partial volume averaging, further reducing contrast with surrounding tissue. A linear configuration should raise suspicion and occasionally wood may be made visible by metallic paint or graphite pencil lead.<sup>3</sup> Misinterpretation is more likely in the presence of a fracture. Magnetic resonance imaging (MRI) allows better distinction of organic foreign bodies from soft tissue and may show objects not located surgically or by CT.<sup>4,5</sup> MRI is contraindicated when a ferromagnetic foreign body may be present.<sup>5</sup> Frequently, the presence, size or number of such foreign bodies may not be fully appreciated until the injury is explored, or some time after, when complications have ensued.<sup>5</sup>

Broad-spectrum antibiotic prophylaxis and tetanus immunisation must be initiated immediately. Temperature and level of consciousness should be monitored and focal neurological signs sought. Intracranial wooden foreign bodies are associated with a 48% incidence of brain abscess and a 25% mortality rate.<sup>10</sup>

Penetrating orbital wounds should be thoroughly explored, probed and the foreign body removed as soon as possible. Depth of penetration and structural damage should be determined by direct visualisation. Microbiological culture should be taken from the wound track, foreign body and any infective focus. A fragmented foreign body may be incompletely removed<sup>8</sup> and promote subsequent abscess, granuloma or fistula formation;<sup>9</sup> occasionally it is spontaneously extruded. Certain orbital retained foreign bodies such as airgun pellets which are not causing symptoms can be left alone.<sup>3</sup> Longer-term follow-up is advisable if there are any misgivings about initial treatment.<sup>8</sup>

This case is unusual in that there were few symptoms or external signs to indicate an orbital penetrating injury. It illustrates both the need for thorough examination and a strong index of suspicion even after the apparent absence of a foreign body on CT scan, and that, radiologically, wood can masquerade as air.

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Sir,

#### Failure of Topical Bupivacaine to Relieve Pain after Vitreoretinal Surgery

Patients often complain of pain and discomfort following vitreoretinal surgery. Local infiltrative anaesthesia for post-operative pain has been used in both general surgery and ophthalmology: Duker *et al.*<sup>1</sup> reported reduced pain scores and opiate usage in patients receiving a retrobulbar

**Table I.** Pain scores: median (95% confidence limits) on a visual analogue scale of 0–10 assessed at the stated times

	Bupivacaine	Controls
4 hours	2.0 (0–3.2)	0.45 (0.1–1.5)
8 hours	0.6 (0–3.0)	0.2 (0–0.8)
12 hours	0.2 (0–2.3)	0 (0–0.2)
24 hours	0 (0–1.0)	0 (0–0.7)

infiltration of bupivacaine 0.75% after scleral buckling surgery. A blunt needle was introduced into the retrobulbar tissues in each exposed quadrant delineated by the recti muscles by directing the needle towards the optic nerve prior to closure of the conjunctiva. However, this is to some extent an invasive technique and as anaesthetic instilled or squirted into a surgical site is easier, less tissue-disruptive and is still effective in some locations, we decided to investigate the efficacy of bupivacaine instillation in reducing post-operative pain after vitreoretinal surgery.<sup>2–4</sup>

The study was prospective, randomised and almost double masked: only the surgeon knew the randomisation but had no role in assessing the patients. Patients aged 18 years and over who were to undergo retinal detachment or vitreous surgery of any kind involving conjunctival incision and general anaesthetic were eligible. Ethics committee approval was given and patient consent was obtained after the nature of the study had been fully explained. None declined to participate. Patients were randomised to receive bupivacaine or not according to a restriction randomisation method ensuring equal numbers in each group. Sixty consecutive patients operated on by the same surgeon (A.J.E.) were admitted to the study, providing 30 eyes in each group. General anaesthesia avoiding the use of long-acting analgesics was used. Prior to conjunctival closure patients randomised to receive bupivacaine were instilled throughout the operative area with 4 ml 0.5% bupivacaine using the bare, blunt end of the syringe to direct the anaesthetic so that it reached all of the sclera and ocular muscles exposed during the procedure and also the conjunctival sac. Controls received no instillation. The conjunctiva was closed and subconjunctival gentamicin administered.

Post-operative pain was assessed using a continuous visual analogue scale (a linear 10 cm scale with the gradations masked to the patient) at 4, 8, 12 and 24 hours.<sup>5</sup> The patients were asked to indicate on the scale the degree of pain experienced at that time from 'none' to 'the worst pain imaginable'. Analgesic requirements were recorded. Pain scores were compared using the Mann–Whitney *U*-test as normal distribution could not be assumed. The power of the trial was assessed using nomograms.<sup>6</sup> One patient who had received a morphine pre-medication and one patient whose poor mental state prevented assessment were disqualified, leaving 58 patients (58 eyes) for evaluation.

There were 14 males and 15 females in each group, which had similar median ages of 63 years. The groups were comparable with respect to type of surgery. Overall

36% of operations involved explant and cryotherapy alone, and 60% had vitrectomies with or without gas or silicone oil. One patient in each group had removal of oil. Comparable numbers in each group had all four recti exposed.

Pain scores at each assessment time (Table I) were slightly higher in the bupivacaine group; however, none of the differences was significant. Likewise no difference in post-operative analgesia requirement was apparent. In other words bupivacaine infiltration had no significant effect.

How can these results be reconciled with the positive findings in the Duker *et al.*<sup>1</sup> study? Pain scores in our study were generally low and may have been insufficient to show an effect of the technique. Visual analogue scales are considered to be more consistent and reliable and are theoretically more sound than the verbal rating scale (such as was used by Duker *et al.*), which, by attempting to assess a continuous variable by a discrete scoring system, may exaggerate the effect of analgesics.<sup>7</sup>

An unlikely possibility is that retrobulbar balanced salt solution given to their controls was itself painful and the anaesthetic simply counterbalanced this. Uninjected controls provide a more realistic comparison.

The wide variety of procedures represented in our study may have diluted the post-operative analgesic effect after the more traumatic procedures. However, separate assessment of procedures involving looping of all four recti muscles gave a similar negative result.

Finally and most probably, instillation or squirting may be an inefficient way of administering anaesthetic: less quantity of chemical would be retained than with an injection method despite the tissue binding property of bupivacaine. In contrast strong supportive evidence of the efficacy of the blunt needle post-equatorial technique is its use as an alternative to general anaesthesia, at least as far as operative pain relief is concerned.<sup>8–10</sup>

In conclusion, topical instillation of 0.5% bupivacaine into the surgical field prior to conjunctival closure in vitreoretinal procedures is ineffective in reducing post-operative pain and analgesic requirements in the first 24 hours and cannot be recommended.

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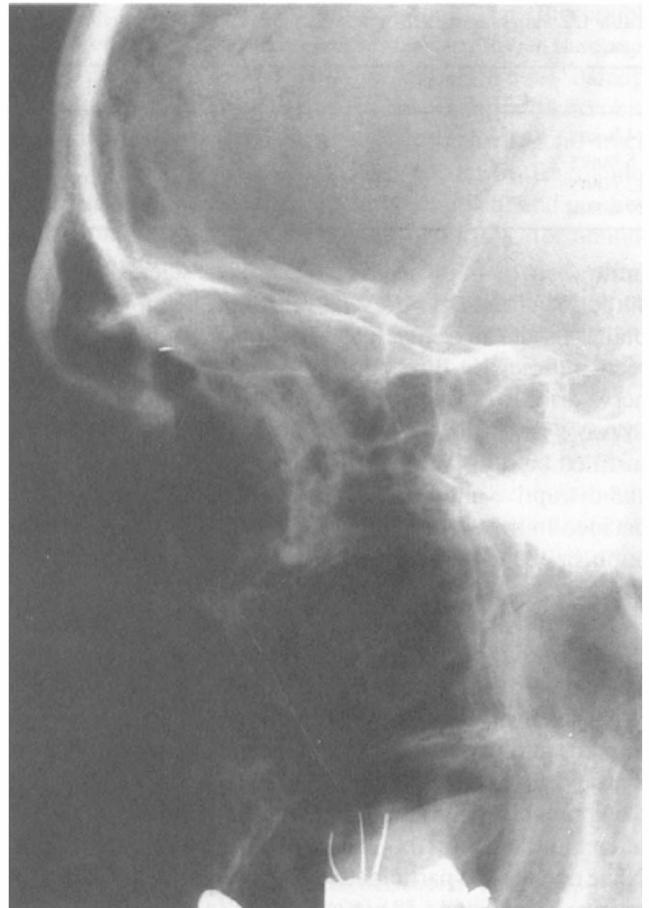
Sir,

#### **Detection of an Orbital Foreign Body by a Skull Radiograph prior to Magnetic Resonance Imaging**

A 71-year-old man with prostatic carcinoma and vertebral metastases was admitted to our unit with spastic paraparesis for urgent magnetic resonance imaging (MRI) of the spine. Whilst working in a foundry in 1942 a foreign metallic body entered his eye; the patient claimed that this had subsequently been removed in an ophthalmic casualty department and his eye was asymptomatic with no visual impairment. To be on the safe side we arranged a skull radiograph prior to his scheduled MRI scan; to our surprise this demonstrated the presence of a metallic object in the orbit (Fig. 1).

MRI relies on the use of extremely powerful magnets to generate changes in the resonant frequency of atoms; these can then be detected by radio-frequency receivers and used to generate a sectional map of the tissues within the magnetic field. A metallic intraocular foreign body would undergo movement in such a field. The scan was therefore promptly cancelled to protect his eyeball from a potentially blinding perforating injury.

This case demonstrates the importance of taking a clear ophthalmic history regarding previous ocular exposure to



**Fig. 1.** *Skull radiograph showing the metallic foreign body in the orbit.*

foreign metallic objects prior to MRI; it also underlines the importance of arranging orbital radiographs where any suspicion of the presence of an inert intraocular foreign body arises.

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