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Sir,

Bamboo Orbital Foreign Body Mimicking Air on Computed Tomography

Injuries to the eye and orbit caused by unprotected garden canes are common and may result in retained orbital or orbito-cranial foreign bodies. The external entry wound may be apparently minor and retained wooden foreign bodies may be difficult to detect radiologically.^{1–9} This case had a large orbital foreign body which computed tomography (CT) failed to detect and had no skin wound.

Case Report

A 25-year-old woman presented to the Accident and Emergency Department of the Royal Berkshire Hospital complaining that her right eye was moderately sore, more so on looking from side to side. The previous day, her right eye had been poked by a vertical bamboo cane while gardening. The only external evidence of injury was two minor upper lid abrasions and slight conjunctival injection temporally.

Closer examination revealed a 6 mm perforation of the conjunctiva deep in the lateral fornix with a number of soil particles at the entry site. Ocular examination was otherwise normal, visual acuity 6/5 on each side and ocular movement full without diplopia.

The patient received tetanus toxoid and prophylactic antibiotics orally and topically to cover aerobic and anaer-



Fig. 1. CT scan showing an elongated radiolucent area in the right orbit (arrow) between the lateral rectus and orbital wall. There is some swelling of the muscle and the tissues of the lateral fornix.

obic bacteria. CT scan of the orbits at 5 mm intervals demonstrated a radiolucent area with a density similar to that of air in the right orbit at the temporal border of lateral rectus, and soft tissue swelling of the lateral fornix and lateral rectus (Fig. 1).

The patient remained afebrile, but by the following morning had developed eyelid swelling and erythema with slight diplopia on dextroversion. The wound was explored under general anaesthesia. Two 2 cm sectoral fragments of bamboo were removed through the entry site (Figs. 2, 3) from between the lateral wall of orbit and lateral rectus, a few fibres of which were frayed just behind the insertion. The location and dimensions of the foreign bodies paralleled those of the radiolucent areas detected radiologically.

Post-operative recovery was unremarkable apart from mild residual limitation of right eye adduction and dextrolevation.

Discussion

Quite large foreign bodies may penetrate the orbit through deceptively small entry wounds because they possess either a sharp end or an elongate form. A high index of suspicion is essential for any eyelid or conjunctival laceration, particularly if orbital fat is visible indicating that the orbital septum has been breached.⁴ It is likely that some foreign bodies entering the orbit are snapped by sideward pressure against the orbital margin causing local bruising or abrasion. Although the eye and all other orbital structures must be assessed for possible injury, the resilience of the sclera and the displaceability of the globe often protect it.⁶

Orbital foreign bodies can penetrate the cranial cavity or paranasal sinuses. The pyramidal shape of the orbit may deflect objects entering it towards the apex, where the superior orbital fissure and optic canal allow passage to the middle cranial fossa. The roof and medial wall of orbit are thin and easily perforated, especially in childhood, and are more vulnerable if the head was extended at the time of

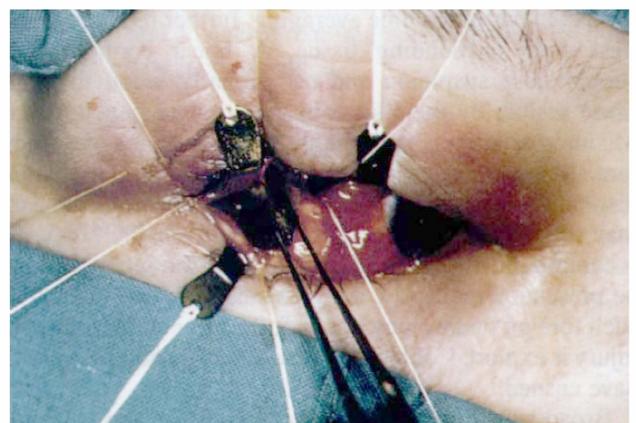


Fig. 2. Forceps removal of the larger of two foreign bodies through the entry site in the lateral fornix. There is eyelid swelling and erythema but there are few external signs of injury. The subconjunctival haemorrhage was caused by surgical manipulation.



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

injury;^{6,10} such injuries are much less common after lower eyelid perforations.³

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 reservoir⁶ 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.⁶ 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.³ 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.^{4,5} MRI is contraindicated when a ferromagnetic foreign body may be present.⁵ 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.⁵

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.¹⁰

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 removed⁸ and promote subsequent abscess, granuloma or fistula formation;⁹ occasionally it is spontaneously extruded. Certain orbital retained foreign bodies such as airgun pellets which are not causing symptoms can be left alone.³ Longer-term follow-up is advisable if there are any misgivings about initial treatment.⁸

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.*¹ reported reduced pain scores and opiate usage in patients receiving a retrobulbar