EMERGENCY CASEBOOK

The ophthalmo-meningeal foramen masquerading as an intraocular foreign body

S Nabili, A W Ferguson, P Gamble, I A Zealley, C J MacEwen

Emerg Med J 2006;23:e41 (<http://www.emjonline.com/cgi/content/full/23/7/e41>). doi: 10.1136/emj.2005.030239

Although the diagnosis of intraocular foreign body is primarily a clinical one, radiographic imaging is often used to clarify the diagnosis and to localise the foreign body. For this case the radiographic findings served to confuse the diagnosis.

A 22-year-old man was involved in a "road rage" incident in which the window on the driver's side of his car was punched in—showering his face with glass fragments. He presented to the accident and emergency department with a painful left eye—visual acuity, however, was unaffected. Plain radiography of the orbits showed a doughnut-shaped 2.5 mm radio-opaque area with a central radiolucency, lateral to the left superior orbital fissure shadow (fig 1). There was no corresponding area on the right side. The patient was reviewed by the ophthalmology department and a 3 mm glass fragment was found in his left inferior conjunctival fornix, with a partial thickness corneal laceration. There was no evidence of penetrating eye injury.

Repeat orbital radiography performed after removal of the conjunctival glass fragment did not show any change in the appearance of the area of interest in the left orbital view, nor was there any change in position of the area with eye movements. Although the clinical appearance was not in keeping with that expected in penetrating eye injury, the radiographical findings remained unexplained. The patient was allowed home with topical chloramphenicol eye ointment for his corneal laceration.

The corneal laceration had healed at review by 1 week, and the eye remained uninflamed. The radiology department diagnosed the unilateral radio-opaque area on the plain radiographs as an ophthalmo-meningeal foramen; an anatomical variant found within the sphenoid bone as it forms the postero-lateral orbital wall (fig 2). Repeat radiography with lateral views was suggested to confirm this diagnosis: the appearances were unchanged, with no intra-orbital opacification evident on lateral views of the orbit. B-scan ultrasound of the eye was also performed, and did not show any intraocular foreign body.

COMMENT

Although the diagnosis of intraocular foreign body should primarily be based on clinical examination,¹ it is often useful to clarify the diagnosis with radiographical evidence. Knowledge of the anatomical variants that can be found on radiography is therefore useful in avoiding embarrassment in this regard. As well as plain radiography, other investigations can be helpful in detecting and localising an intraocular foreign body. B-scan ultrasonography is easy to perform if available and is of particular use in the presence of opaque media. It is worth remembering, however, that in the case of penetrating eye injury, direct contact between the ultrasound

transducer probe and the eye may exacerbate any local injury and increase the risk of introducing infection.² Although computed tomography (CT) scan of the orbit was not performed in this case, this form of imaging is exquisitely sensitive to the identification and localisation of foreign bodies,² the smaller examples of which may be obscured by surrounding bone on plain radiography. CT is the investigation of choice in the presence of strong clinical suspicion of an intraocular foreign body. Magnetic resonance imaging (MRI) is a potentially useful technique for identification and localisation of foreign bodies, but is rarely used in the acute setting. It is also contra-indicated if ferro-magnetic foreign bodies are suspected.

The absence of any clinical findings consistent with penetrating eye injury was the main factor in excluding an intraocular foreign body in this patient. This was supported by the fact that the suspicious area did not change position on comparing radiographs with the eye in elevation and depression. The absence of any abnormal findings on B-scan ultrasound of the eye served to further exclude intraocular foreign body as a diagnosis. With this clinical picture, we did not feel the extra radiation dose associated with CT scan was warranted. As an additional negative finding, we were only considering a glass foreign body (in keeping with the history of the trauma)—which is uniformly radio-opaque on plain radiography, irrespective of lead content—whereas the area on our patient's radiograph was a radio-opaque toroidal ring with a radiolucent central area.¹ This is in keeping with the appearance of a bony foramen viewed end-on; in this case the ophthalmo-meningeal foramen.

The ophthalmo-meningeal foramen is also known as the lacrimal foramen,³ the meningeal foramen,⁴ or the foramen meningo-orbitale.⁵ It is an anatomical variant that occurs in approximately 60% of skulls (unilateral in 34% and bilateral in 27%).³ Its longest diameter varies from 0.3–4 mm. It exists as a channel for vascular anastomosis between the middle meningeal and the lacrimal arteries. In some cases this anastomosis may replace the ophthalmic artery as the primary blood supply to the orbit.⁶ This case served as a

Figure 1 Radio-opaque area with a central radiolucency.

Figure 2 Ophthalmo-meningeal foramen.

useful reminder of the relative importance of clinical findings when making a diagnosis, as well as reminding us that knowledge of the normal appearance, as well as possible anatomical variants, is required to avoid confusion when interpreting the results of any investigation.

Authors' affiliations

S Nabili, Ophthalmology Department, The Royal Victoria Hospital, Belfast, UK

A W Ferguson, I A Zealley, C J MacEwen, Tayside University Hospitals NHS Trust, Ninewells Hospital, Dundee, UK

P Gamble, Perth Royal Infirmary, Perth, UK

Competing interests: None.

Correspondence to: S Nabili, Ophthalmology Department, The Royal Victoria Hospital, Grosvenor Road, Belfast BT12 6BA, UK; sn@doctors.org.uk

Accepted for publication 21 January 2006

REFERENCES

- 1 **Raby N**, Berman L, de Lacy G. *Accident & emergency radiology - a survival guide*. Philadelphia: Saunders, 1995:208–215.
- 2 **Redman HC**, Purdy PD, Miller GL, et al. *Emergency radiology*. Philadelphia: Saunders, 1993:149–154.
- 3 **Bergman RA**, Afifi AK, Miyauchi R. *Illustrated encyclopaedia of human anatomic variation: Opus II: cardiovascular system, variation in ophthalmic artery*, University of Iowa, 2002, Opus V. Available at <http://www.anatomyatlases.org/AnatomicVariants/AnatomyHP.shtml>.
- 4 **Tasman W**, Jaeger EA. *Duane's system of ophthalmology* (CD-ROM). Philadelphia: Lippincott Williams & Wilkinson, 1999, Record 18993/175284).
- 5 **Georgiou C**, Cassell MD. The foramen meningo-orbitale and its relationship to the development of the ophthalmic artery. *J Anat* 1992;**180**:119–25.