CASE REPORT

Penetrating orbital trauma by stiletto causing complex cranial neuropathies

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Penetrating orbital injuries pose a serious threat to vision, ocular motility, and in some cases, life. Long, sharp stiletto objects may penetrate deeply, causing catastrophic damage to orbital structures, despite seemingly trivial entry wounds. The authors present two cases of penetrating orbital injuries by stiletto objects, both entering via small eyelid wounds. Traumatic optic neuropathy occurred in both cases, and was treated with corticosteroids, however the globes escaped direct injury. Injuries to the IIIrd and VIth cranial nerves were also observed. Deep orbital injuries must be excluded in patients presenting with small eyelid wounds caused by sharp penetrating objects.

CASE HISTORIES

Case 1: Miss H

Miss H is a 16 year old who, while supine on a dance floor, was stepped on by a fellow dancer wearing stiletto heels. The heel penetrated her right orbit, entering through a small, irregular upper lid wound. Miss H presented to A&E complaining of headache and right eye pain (fig 1A).

Near visual acuity in the right eye was N10. There was a small right upper lid laceration, just beneath the superior orbital rim. There was a complete right ptosis, and the eye was depressed and adducted (fig 1B). Elevation and abduction was absent, and there was a right afferent pupillary defect. Aside from some temporal subconjunctival haemorrhage the globe was spared from direct injury. There was paraesthesia of the right forehead.

Orbital CT and MRI scans excluded fractures and foreign bodies. Haemorrhage was present within the orbit superiorly, along the track created by the stiletto. The globe and extraocular muscles were intact, but there was mild optic nerve sheath oedema. Miss H was treated with IV methylprednisolone, antibiotics, and visual acuity was monitored closely.

In this case the stiletto heel tracked along the roof of the orbit towards its apex, traumatising the optic nerve, the superior division of the IIIrd nerve and the VIth nerve (fig 2).

Palsy of the superior division of the IIIrd nerve was manifested by a complete ptosis due to paralysis of levator palpebrae superioris, and absent elevation due to superior rectus weakness. The VIth nerve palsy resulted limitation of abduction. Supraorbital nerve injury caused right forehead paraesthesia.

Seven months post-injury, visual acuity had improved to 6/6. Elevation and abduction were still limited. The ptosis persisted, thus preventing diplopia by occluding the right eye. Surgery was planned to correct the ocular position.

To our knowledge, this is the first reported case of a stiletto heel causing orbital penetration and traumatic optic neuropathy.

Case 2: Miss M

Miss M is a 9 year old who fell while rollerskating, and a thin bamboo cane she was carrying penetrated her right orbit medially. Visual acuity upon presentation was counting fingers in the right eye and 6/6 left.

The cane entered the orbit through a 1 cm laceration of the medial lower lid, which tore the inferior canaliculus (fig 3A). Ocular movements were initially restricted in all directions, and the eye was incyclotorted. There was 5 mm of proptosis. The right pupil was mid-dilated, and there was a right afferent pupillary defect. Examination of the eye itself was normal.

A CT scan revealed an intact globe, optic nerve, and extraocular muscles, and no orbital fractures or foreign bodies were demonstrated. The laceration was repaired, and four days post-injury the right visual acuity had improved only to 6/60, and oral prednisolone was commenced.

At this point the right eye was incyclotorted and exodeviated, and adduction was markedly reduced. There was mild limitation of elevation and depression. This was consistent with a right partial IIIrd nerve palsy involving the medial and inferior recti. Electrodiagnostic tests were performed. Flash visual evoked potential suggested optic nerve damage, consistent with traumatic optic neuropathy. Pattern visual evoked potential showed preservation of macular function with moderate vision levels.

Eight weeks post-injury right visual acuity had improved to 6/6, although colour vision was subjectively reduced. Ocular

Figure 1 (A) Right ptosis with upper lid entry wound. (B) Ocular movements, displaying absent right elevation and abduction.

Figure 2 Right orbit, anterior view.

Figure 3 (A) Lower lid entry wound, disrupting the inferior canaliculus. (B) Final postoperative result.

movements were normal, although a small right exophoria remained. The lid position was satisfactory with no epiphora (fig 3B).

DISCUSSION

These cases demonstrate the catastrophic injuries that may arise from orbital penetration by a stiletto. Significant orbital and intracranial injuries may result, despite apparently trivial entry wounds through the eyelids or conjunctiva.¹ Thus orbital entry wounds must be treated with great suspicion, however small.

Penetrating eye injuries most usually occur, and must be excluded. The orbit and globe should be examined with great caution, avoiding excessive pressure and manipulation,

which may cause extrusion of ocular contents if the globe is indeed ruptured.

Intracranial injuries may exist without immediate neurological signs, and thus must be excluded by imaging with CT or MRI.² Death is a reported complication of penetrating orbital injury.¹ Intraorbital foreign bodies should be identified and removed as appropriate. Retained copper and organic debris may be particularly problematic.³

Traumatic optic neuropathy is likely in patients with reduced vision and a relative afferent pupillary defect. There are no definitive guidelines regarding the use of steroids in TON, however if used they should be considered early.⁴

NOTE

Ethics approval was not obtained, as these two case histories were written retrospectively. Written consent was obtained for photographs.

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