

Case Report

Impacted iron nail in the orbit and maxillary sinus through a corneo-scleral perforation: a case report

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Abstract

Introduction: Open globe injury is one of the commonest ophthalmic emergencies, and when accompanied by intraocular foreign bodies, the condition carries a poorer prognosis.

Objective: To report a rare case of perforating injury of the globe with an iron nail which got lodged in the maxillary sinus. **Case:** A ten-year-old boy presented with the history of sudden painful loss of vision in his right eye. He reported that he was hit forcefully by the tail of a cow a day before the presentation. There was no perception of light in that eye. The ocular examination revealed a full thickness corneo-scleral perforation with prolapsed uveal tissue. The X-ray of the right orbit showed an impacted foreign body in the inferior orbit and computed tomography scan of the orbit confirmed the presence of a vertically impacted metal piece in the right orbit and right maxillary sinus. The repair of the perforation and removal of the impacted nail was done in two stages. The globe anatomy was maintained but the vision could not be restored due to the grave nature of the trauma. **Conclusion:** Perforating globe injury is an important cause of monocular blindness.

Keywords: foreign body, perforation, trauma

Introduction

Eye injuries are an important cause of ocular morbidity in children, being a leading cause of non-congenital unilateral blindness in this age group (MacEwen et al, 1999). It is the most important cause of unilateral loss of vision in developing countries and 5% of all bilateral blindness is directly due to trauma (Thylefors et al, 1992). An estimated 7.9% of all blindness in Nepal is caused by ocular trauma (Brilliant et al, 1985). But it is believed that over 90% of all eye injuries can be prevented, making ocular trauma one of the important preventable causes of blindness (Parver et al, 1993; Whitcher et al, 2001).

Ocular injury can occur in three forms: open globe, closed globe and chemical injuries. Open globe injury is one of the commonest ophthalmic emergencies requiring urgent surgical attention. When the injury is accompanied by intraocular foreign bodies, the condition carries a poorer prognosis. The foreign bodies that enter the eye may cause damage in two different ways. They may produce structural damage to the intraocular contents as they enter the eye or may cause toxicity to tissues as they degrade and oxidize, if not removed early.

The public health importance of such ocular trauma is undeniable. Injuries generate a significant and often unnecessary toll in terms of medical care,

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human suffering, long term disability, productivity loss, rehabilitation services and socioeconomic cost.

Case report

A ten-year-old boy presented in the emergency of B P Koirala Lions Center for Ophthalmic Studies, Kathmandu with the history of sudden painful loss of vision in right eye since one day. He gave a history of forceful hit by a cow's tail on his right eye while working at the cowshed one day back. Following the trauma, he was unable to open his eye and there was severe pain and bleeding.

On examination, he was well oriented to time, place and person and his higher mental functions were intact. Unfortunately, there was no perception of light in his right eye while the visual acuity in the left was 20/20. The extraocular motility was full in all gazes. His right eyelids were mildly swollen but the orbital rim was intact with no crepitation and the overlying skin of the eyelids and of the face was also normal.

There was a diffuse ciliary congestion of the conjunctiva. A full thickness corneal laceration of 5.2 mm length extending from 3 mm beneath the superior limbus encroaching upto the inferior limbus at 6 o' clock position was present in the pupillary axis. The corneal perforation was continuous with the scleral perforation of 3.0 mm length. A shallow anterior chamber, presence of hyphema and prolapse of the iris tissue through the corneo-scleral laeration were also noted. The details of the lens and of the posterior segment could not be visualised. The left eye was normal.

The ultrasonography of the right eye was not attempted as the child was in pain and there were chances of extension of perforation on forceful attempt. An X-ray of the right orbit showed an impacted foreign body in the inferior orbit (Figure 1). The computed tomography scan of the orbit and the para nasal sinuses revealed a perforated right globe with a hyperdense vertical shadow occupying the right orbit and the right maxillary sinus suggestive

of an impacted metal piece with no muscle entrapment (Figure 2a and 2b).

The patient was admitted after explaining the poor prognosis of the right eye and intravenous antibiotics were started. The primary repair of the corneo-scleral perforation with abscission of the prolapsed and necrosed iris was done on the emergency basis. The hyphaema was washed out and the cataractous lens was visualised. However no intraocular foreign body was found during the surgery. In the second sitting after three days of primary repair, a combined operation was done with a maxillofacial surgeon. An exploration of the orbital floor and maxillary sinus was done via a subciliary incision. An iron nail of 2.5 cm length was found with the head embedded in the orbital floor 2 cm posterior to the inferior orbital rim. The tip had penetrated the orbital floor and the roof of the maxillary sinus and was entrapped therein vertically. The nail was removed in a single piece (Figure 3).

Post operatively, the intravenous antibiotics were continued together with oral analgesics, topical antibiotics and steroids with cycloplegics. The vision was no perception of light, the wound was healthy with intact sutures, the anterior chamber was formed with residual hyphaema and the lens was cataractous with no view of the retina (Figure 4). Ultrasonography revealed posterior perforation of retina and sclera.

During his hospital stay, he was administered intravenous and topical antibiotics and steroids (in low dose). The patient was discharged on the 13th day of admission with oral antibiotics and low dose oral steroids in a tapering dose and topical antibiotics. On follow-up after three weeks, the visual status was similar, the eyeball was soft, the corneal sutures were intact. The anterior chamber was formed with a non-reactive pupil and a cataractous lens. The intraocular pressure was only 6 mmHg suggesting the ongoing state of atrophic bulbi.



Figure 1: X-ray skull and paranasal sinuses, AP view, showing the foreign body in the orbital floor and inside the maxillary sinus

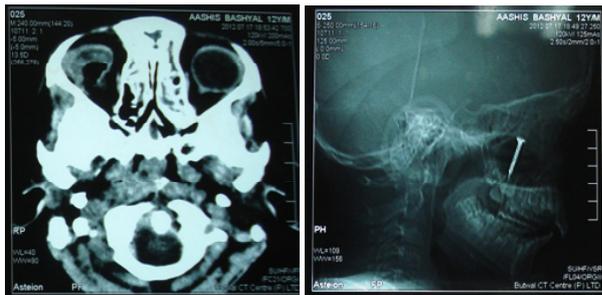


Figure 2a and 2b: CT scan of the head and orbit, sagittal and axial view showing posterior perforation of the right globe and the presence of a nail in the right orbital floor and maxillary sinus



Figure 3: The nail after removal from orbit and maxillary sinus

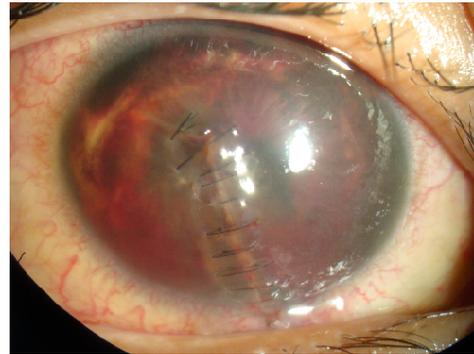


Figure 4: The corneo-scleral perforation after primary repair with hyphema

Discussion

This is a rare case where an iron nail entered into the globe via a corneo-scleral perforation, pierced the lens and exited through the retina and posterior sclera from where it perforated the floor of the orbit and finally got lodged in the maxillary sinus. Worldwide, ocular trauma is an important cause of eye morbidity. Open globe injuries (53.9%) are more common than closed globe injuries (42.2%) and boys are affected more frequently than girls are (Saxena et al, 2002). In a study from western Nepal, 57% of the children were male, most of them were of the age group 5-16 years. The perforating eye injury was found in 5% and ultimately 5% had no perception of light even after treatment (Adhikari et al 2010).

The nature of trauma suggests that the child must have received a forceful high velocity trauma with the cow's tail with the nail entangled in it. The floor is the weakest part of the orbit - this might be the other reason for the ease with which the nail traversed it. The prognosis in such a case is very poor but timely removal of the foreign body is essential to prevent the siderosis- related complications.

The most important aspect of pediatric eye trauma is prevention. The irreversible nature of visual loss and the immense morbidity associated with it need to be emphasized and publicized. Visually impaired children as a result of trauma have a significant



negative impact on the trauma victims themselves, the community they live in, and to the nation as a whole in terms of sufferings, medical cost and loss of productivity.

Conclusion

Open globe injury carries a poor prognosis for vision and when superadded with a retained foreign body leads a child to suffer from long term visual impairment. This has a major impact on social, emotional and psychological development of a child.

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