

An Unusual Entry Site of An Intraorbital Foreign Body in a Child

P S Mallika, MBBS, MS (Ophthalmology), Y J Chong, MBBS, A K Tan, MD, I P Tang, MBBS, MS (ENT), S Aziz, MBBS, MS (Ophthalmology), H K Lee, MBBS, MS

University Malaysia Sarawak, Lot 77, Seksyen 22, Kuching Town Land District, Jalan Tun Ahmad Zaidi Aduce, Kuching, 93150 Sarawak Malaysia

SUMMARY

Intraorbital foreign bodies (IOrbFB) are associated with both sight and life threatening injuries. We report a case of an IOrbFB associated with retrobulbar hemorrhage and injury of the frontal sinus in an 11 year-old boy, after history of fall from the tree. Imaging studies revealed a metallic foreign body (FB) in the orbit and fracture of the walls of the frontal sinus. The usual entry route of an IOrbFB is either through the eye or orbital walls and extremely rare through the paranasal sinuses. This is the first reported case of a FB entering the orbit through the frontal sinus.

KEY WORDS:

Ocular trauma; intraorbital foreign body; retro bulbar haemorrhage; CT imaging; penetrating injury

INTRODUCTION

Childhood ocular trauma is frequent and is associated with significant visual impairment. Penetrating ocular injuries are common in children, especially among young boys due to the high physical contact and aggressive nature of play among them. Of all penetrating eye injuries, 27%-48% affect the children¹. Thus children represent a disproportionately large percentage of total ocular traumas. Penetrating ocular injuries generally carry a poorer prognosis than blunt trauma and the prognosis becomes much worse if it is associated with either an intraocular or intraorbital foreign body.

The orbits are the bony cavities that contain the globes, extraocular muscles, nerves, fat and the blood vessels. The orbital wall is composed of seven bones: ethmoid, frontal, lacrimal, maxillary, palatine, sphenoid and zygomatic. The bony orbit is closely related to the paranasal sinuses, nasal cavity, anterior cranial fossa, middle cranial fossa and temporal fossa. Hence any ocular trauma involving the orbit may involve the adjacent structures and vice versa resulting in both sight-threatening and life-threatening injuries. Usually the entry site of an IOrbFB is through the eye or the orbital walls. Entry through the paranasal sinus, especially the frontal sinus is rare. We present a unique case of a penetrating fronto-orbital trauma from a metallic nut which was associated with a poor visual outcome.

CASE REPORT

An 11 Year old boy was seen in the emergency department 2 hours after history of fall from a tree while playing. He landed

face down onto a pile of metallic rubbish and sustained an injury involving the right frontal sinus. Subsequently he developed severe pain of his right eye, which was associated with eyelid swelling, redness, and loss of vision. There was no loss of consciousness or ear, nose and throat bleed (ENT). His vital signs were normal and there were no neurological deficits. He had a full thickness wound measuring about 2cm x 2cm on the right frontal sinus area. Ocular examination of the right eye showed periorbital edema, proptosis, congestion and chemosis of the conjunctiva and restriction of extraocular motility (figure 1). His vision was no perception of light (NPL) and the reverse relative afferent pupillary defect (RAPD) was positive. Anterior segment examination showed a total hyphaema in the anterior chamber with absent red reflex. The intraocular pressure (IOP) was 24 mm Hg in the right eye and 14 mm Hg in the left eye. As fundus examination was not possible an ultrasound examination was done which showed a dense vitreous hemorrhage.

X-ray of the orbit (AP and lateral views) revealed a large metallic foreign body inside the right orbit cavity (figure 2). An urgent CT scan was done which showed in addition, fracture of the anterior and lateral wall of the right frontal sinus. The optic nerve was stretched and curved downwards; however the globe was intact, with associated retrobulbar hematoma.

The child received tetanus prophylaxis and was started on intravenous ceftriaxone 1gm 12 hourly, cloxacillin 500mg 6 hourly and metranidazole 250 mg 8 hourly. The IOrbFB was removed endoscopically by an external Lynch incision under general anaesthesia. The recovered IOrbFB was a large rusted metallic nut measuring about 2cm x 1cm. Post-operative he was started on topical corticosteroids, antibiotics and topical anti-glaucoma medications. His extra ocular motility improved after 48 hours; however his vision remained the same. The poor visual outcome of our patients was due to the direct optic nerve injury. The systemic antibiotics were continued post-operatively and the boy was discharged after a week.

DISCUSSION

Intraorbital foreign bodies usually occur after a high velocity injury like a gunshot, industrial accidents and motor vehicle accidents and are uncommon after a fall. The usual entry site into the orbit is either through the medial canthus or upper lid². Thakore and Guli reported an unusual entry of an

This article was accepted: 4 August 2011

Corresponding Author: Mallika Premseenthil, University Malaysia Sarawak, Ophthalmology, Lot 77, Seksyen 22, Kuching Town Land District, Jalan Tun Ahmad Zaidi Aduce, Kuching, 93150, Sarawak, Malaysia Email: pmallika@fmhs.unimas.my / drmallikaps@gmail.com



Fig. 1: Picture shows a full thickness wound over the right frontal sinus area. The Right eye is proptosed with severe chemosis and congestion of the conjunctiva.

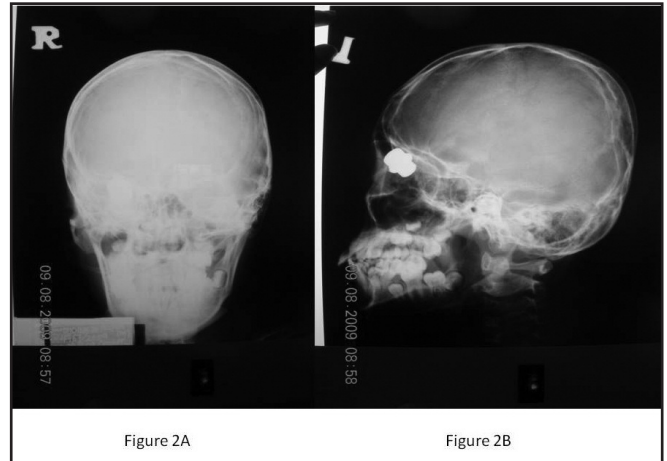


Fig. 2: 2A: X-ray of the orbit AP view showing fracture of the anterior and lateral wall of the right frontal sinus and a huge metallic foreign body in the orbit.
2B: Sagittal plain radiograph of the child shows a large metallic foreign body in the right orbital cavity.

IOrbFB through the nose³. Entry through the paranasal sinuses, especially the frontal sinus is a very rare occurrence. The mechanism of ocular damage in a metallic IOrbFB could be either due to the direct trauma or indirect mechanisms like associated haemorrhage, infection and chemical composition. In our case the huge metallic IOrbFB caused a direct damage to the optic nerve and the retro-orbital blood vessels causing retrobulbar hematoma with compression of the globe.

Metallic foreign bodies are commoner than inorganic non-metallic foreign bodies, such as plastic, glass, as well as organic foreign bodies such as vegetables⁴. A retained metallic foreign body may cause a variety of symptoms, signs and clinical findings based on the size, location and its composition⁵. In our patient the clinical features of proptosis, congestion and chemosis of the conjunctiva with an increase in the IOP were due to the retrobulbar hemorrhage. The huge size of the IOrbFB was the possible cause for the extraocular motility restriction. No light perception on presentation and a positive afferent pupillary defect was due to the direct optic nerve injury.

Appropriate imaging modalities should be done in all suspected cases to confirm and localize the IOrbFB. CT scan is the most versatile imaging mode and is the method of choice when a metal IOrbFB is present. It is valuable in identifying associated fractures and injury to adjacent structures. MRI is contraindicated in the presence of a metallic FB.

Patients with open-globe injuries with suspected intraocular or intraorbital foreign body are started on systemic antibiotics usually a combination of a second or third generation

cephalosporins and an aminoglycoside. In younger children antibiotics to cover penicillinase producing organism like oxacillin and nafcillin can be used. Anaerobic organisms should be covered in suspected organic IOrbFB. Surgical removal is easy for anteriorly located foreign bodies. Posteriorly located foreign bodies have an increased risk of motility disturbance and optic neuropathy after surgical removal. In our case though the visual prognosis was poor the FB was removed due to its large size. Although IOrbFB are common after severe orbital trauma, it has also been reported following trivial injury hence a high index of suspicion in all cases of ocular trauma especially those involving the posterior segment will help in the proper diagnosis and management of IOrbFB's.

ACKNOWLEDGEMENTS

We would like to thank all the staff of Sarawak General Hospital involved in the care of this patient.

REFERENCES

1. De Juan E Jr, Sternberg P Jr, Michels RG. Penetrating ocular injuries. Types of injuries and visual results. *Ophthalmology*. 1983; 90(11): 1318-22.
2. Michon J, Liu D. Intraorbital foreign bodies. *Semin Ophthalmol*. 1994; 9(3): 193-9.
3. Thakore SB, Guly U. Intra-orbital foreign body: an unusual route of entry. *J Accid Emerg Med*. 1999; 16(6): 456-7.
4. Boncoeur-Martel MP, Adenis JP, Rulfi JY, Robert PY, Dupuy JP, Maubon A. CT appearances of chronically retained wooden intraorbital foreign bodies. *Neuroradiology* 2001; 43(2): 165-8.
5. Copper W, Haik BG, Brazzo BG. Management of orbital foreign bodies. In: Nesi FA, Levine MR, Lisman RD, eds. *Smith's Ophthalmic Plastic and Reconstructive Surgery*. St. Louis: Morsby; 1998: 260-9.