

To remove or not to remove: Intraconal metallic foreign body: case report

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ABSTRACT

Background- Foreign bodies (FB) are implicated in 17-30% of penetrating ocular injuries. We encountered 2 cases of perforating ocular trauma with metallic intra-orbital FB in 2 teenage males.

Case report: A 17-year-old male presented with a nail-hammer injury 6 hours after trauma. Snellen's acuity was 3/60 with a corneal laceration of 5mm with lens matter in the anterior chamber and vitreous hemorrhage. After primary repair by the anterior segment surgeon, posterior segment surgery was done following the diagnosis of retinal detachment (RD) and intra-ocular Foreign Body (FB) by ultrasound. No FB was noted intraoperatively. On Computerized Tomography (CT), metallic FB 5.2x3.5 mm was noted at the insertion of the inferior oblique muscle. Removal of IOFB was deferred by the oculoplasty department. Delayed oil removal was done with final Snellen's acuity 6/12p. Another 16-year-old male attended the retina clinic 20 days after injury with a metal-on-metal hammering incident. Primary topical management was done elsewhere. Snellen's acuity was 6/18p in the affected eye. The site of FB entry was scleral, 1.4 mm from limbus at 9 o'clock with no associated lens trauma. CT scan of the brain and orbit showed intra-orbital FB medial to the medial rectus near the orbital apex. FB (4.4x4.3 mm) left a tract in subretinal space to enter intraconal space 1 disc diameter nasal to optic disc. Vitrectomy was done for tractional RD and postoperative Snellen's vision was 6/12.

Conclusion

A high degree of clinical suspicion is necessary to detect and localize IOFB. Non-toxic intra-orbital FB may be left in the context of good vision in the affected eye and possible iatrogenic optic nerve damage.

Keywords: Intra-orbital foreign body (IOFB), retinal detachment (RD), vitrectomy, intraconal space.

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INTRODUCTION

According to the US ocular injury database, foreign bodies are implicated in 17-30 % of penetrating ocular traumas. The exact data however may not be accurate as these injuries are rare and represent only 3% of total emergency room visits. Different types of injuries implicate different types of foreign bodies in the eyes, the most common causes being metal-on-metal injury and male gender and young age group (21-40 years). Posterior segment intraocular foreign bodies are implicated in 58-88% however there are no definite statistics of perforating ocular injuries with intra-orbital, more particularly intraconal foreign bodies [1].

We describe 2 cases of ocular trauma with metal-on-metal hammering incidents with potentially vision-threatening retinal involvement in two adolescent males. These are rare instances where these patients had miraculously good visual outcomes.

CASE REPORT:

Case 1

A 16-year-old male sustained injury to the left eye in a nail hammering incident by a neighboring worker at a construction site. He presented to the eye hospital within 6 hours of injury where full-thickness corneal laceration was noted with lens injury and lens particles in the anterior chamber.

Immediate primary repair was done by the anterior segment surgeon with corneal suturing followed by pad and bandaging. As the patient and attendees refused an immediate CT scan, a B-scan of the orbit showed a metallic level shadowing in the posterior aspect of the globe. Lensectomy with vitrectomy was immediately done by the vitreoretinal surgery team the very next day and the search for the foreign body was done. No foreign body was visualized intraocularly even on meticulous search with scleral depression of the periphery. A suspicious area was seen approximately 1.5disc diameters (DD) temporal to the macula suspected as the site of exit of a foreign body and was adequately lasered. All precautions were taken and silicone oil was injected. The patient was sent for CT scan of the head and orbit which revealed a large foreign body 5.2X3.5mm of metallic attenuation lodged in the ocular wall just temporal to the posterior pole near the insertion of the inferior oblique muscle. (Fig.1) On repeated follow up the retina seemed stable with the development of fibrous tissue at the suspicious site of exit. Laser was done in multiple sessions around the fibrous proliferation as well as prophylactic 360 degrees barrage to the periphery. Delayed silicone oil removal was done, after 18 months of initial surgery. The final visual acuity through the affected eye 24 months after silicon oil removal was 6/12p and OCT scan through the macula revealed a relatively preserved anatomy. (fig.2)

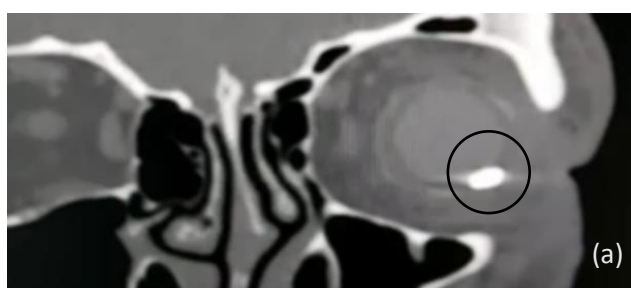


Fig.1. (a) Coronal view (b) axial view of CT scan of orbit showing hyperdense foreign body noted abutting the ocular coat and located in the intraconal space of the left orbit.

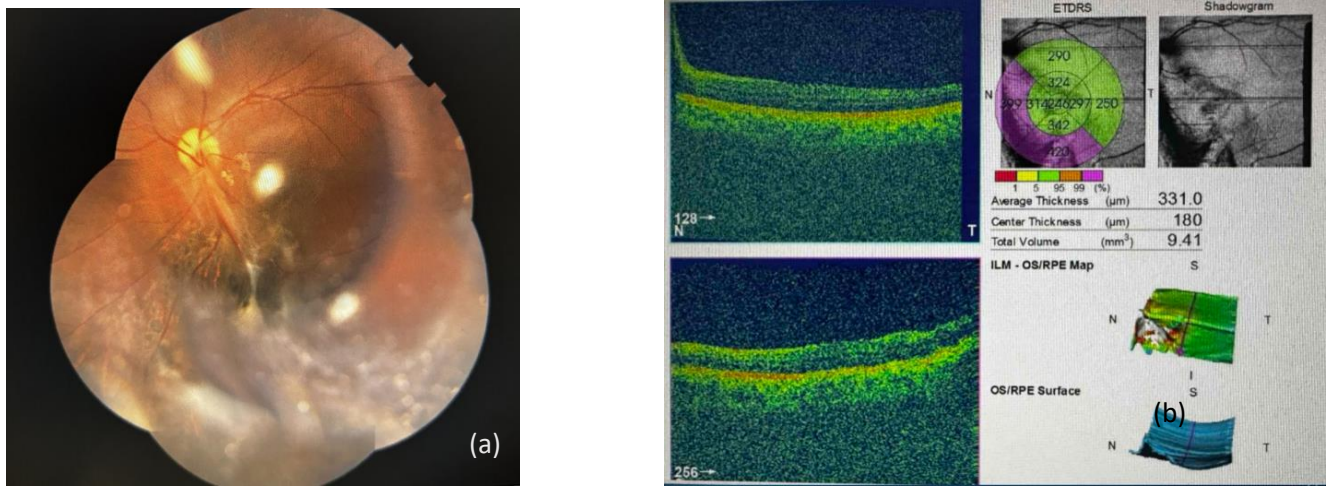


Fig.2. (a) Montage view fundus photograph of affected eye showing lasered and stable fibrous bands in inferior fundus. (b) OCT macula showing relatively preserved macular anatomy

Case 2

A 17-year-old male from India presented 20 days after iron hammering injury to left eye at work. He had received primary medical management for suspected sealed open globe injury with intramuscular injection of tetanus toxoid vaccine along with topical antibiotics and homatropine at his primary care center from where he went after 2 days to a secondary level eye hospital which further referred him to a tertiary eye hospital. On presentation at our center, he had resolving 360-degree subconjunctival hemorrhage with no sign of retrobulbar hemorrhage with clear cornea, negative Siedel's test. Suspected point of entry was a 1.2 mm entry wound 1.4 mm from 9 o'clock

limbus with oblique path. Anterior chamber depth was normal (VH Gr IV equal depth all round) AC cells- 4-5 cells/hpf (high power field), lens clear, anterior vitreous showed presence of pigments and vitreous hemorrhage was noted. Hazy view of disc was seen clinically. Supero-nasal and inferonasal retinal detachment was noted but exact extent couldn't be localized due to hazy media, no retinal tear was visible (7-11 o'clock detached-combined mechanism Retinal detachment). Documentation from previous hospital showed X-ray with intra-orbital metallic foreign body. (fig.3 A) Patient was asked for CT scan of head and orbit for exact localization of foreign body.(fig.3 B)

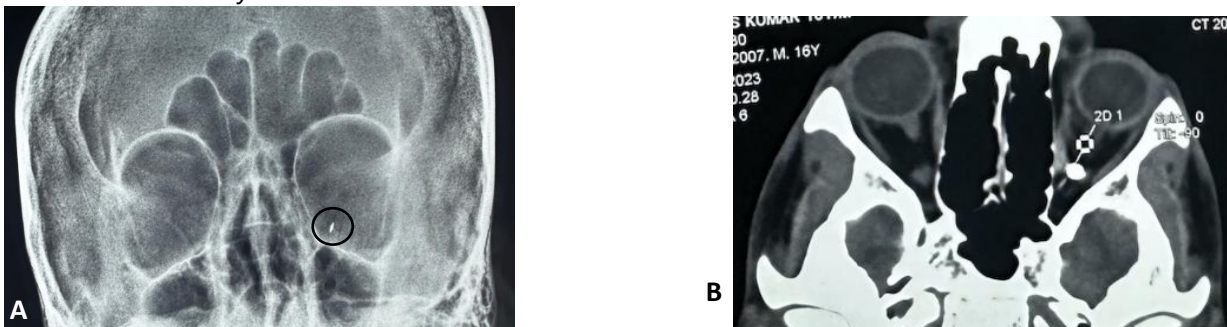


Fig.3A First documentation of metallic orbital foreign body (in black circle) in left orbit (X-ray-Towne's view). **Fig.3B.**CT scan head and orbit, axial scan showing location of foreign body in medial aspect of intraconal compartment abutting the medial rectus and intraconal part of optic nerve.

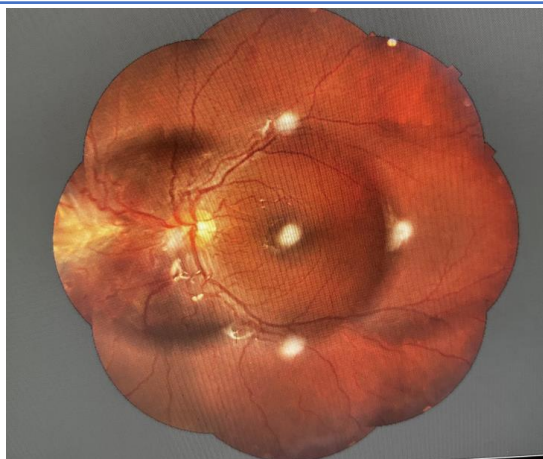


Fig.4. Fundus photo montage view showing laser-stabilized tractional bands in the nasal aspect of fundus starting 1DD nasal to optic nerve head

Pars-plana vitrectomy was done with belt buckle applied for additional external tamponade. The foreign body was not found even after a meticulous search with scleral depression. Luckily, the crystalline lens was spared. A suspicious area with a tractional band nasal to optic disc was lasered. Internal tamponade was done with silicone oil. On the first post-operative day, Snellen's visual acuity was 6/36P. at one week post-operative follow-up, pinhole vision was 6/12 pa which was maintained till final oil removal. The retinal fundus revealed a normal posterior pole which accounted for good visual acuity. (Fig.4).

DISCUSSION

Ocular injury with metallic foreign bodies may be vision-threatening. Literature reports state that this is a rare event. In a case series conducted over 10 years at a tertiary eye center in China, only 96 cases of intraocular foreign body after trauma were reported. Most of these injuries were work-related (46.9%). There was a definite male predilection (81 of 96 cases) and the working age group was primarily involved with a median age of 39.5 (1.6–76.0) years [2].

In this context occurrence of intra-orbital foreign bodies is scarce, constituting only 16.7% of orbital trauma cases [3,4]. The damage done may be sight-threatening and may not only be structural but also may be associated with

chemical toxicity and microbial infection and invasion into extra orbital tissue [5]. In a case series of 32 patients, it appears that the anatomical outcomes are better than functional outcomes even after neurosurgical intervention. Anatomical outcomes were assessed by occurrence of extra-ocular movement restriction, proptosis/ dystopia/ enophthalmos, and orbital sulcus fullness which improved in 8 of 26 (30.77%), 20 of 24 (83.33%), and 12 of 15 (80%) cases. The functional outcomes had been compared in terms of visual acuity, diplopia improvement and pupillary reaction. In comparison to pre-surgical parameters, improvement was noted in none (0%), 13 of 20 (92.86%), and 5 of 12 (62.5%). A gross disparity was noted in improvement in anatomical and functional outcomes whereby anatomical outcomes were much better than functional outcomes [6].

In the above two cases, there was no anatomical sequelae in terms of extraocular movement restriction, proptosis/ dystopia/ enophthalmos, and orbital sulcus fullness. Radiologically, even though both metallic foreign bodies were found in close proximity to the ocular coats, a meticulous search intraocularly revealed no foreign bodies were found. Both these cases had a very fateful anatomical and functional outcome hence they outline the dire necessity of a high degree of clinical suspicion for the diagnosis and management of these foreign bodies. In terms of prognosis, both cases may have a completely normal life but will require to avoid exposure to strong magnetic field, particularly Magnetic Resonance Imaging (MRI) to preserve the anatomy and functional outcome.

CONCLUSION

All ocular injuries with suspected intra-ocular or intra-orbital foreign bodies must be dealt with utmost care and priority. In cases where a metallic foreign body is ruled out by history, magnetic resonance imaging is the better modality for diagnosis, localization and consequent management of the foreign body. In terms of intra-orbital foreign bodies, anatomical outcome is significantly better than functional. Wherever

the anatomy and functionality hasn't seriously declined, it appears safe to leave the metallic foreign body undisturbed within the orbital

confines, provided the patient is alerted to avoid strong magnetic fields.

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