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(CASE REPORT)

A case report of Intraorbital foreign bodies its clinical presentation and surgical outcome

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Abstract

The occurrence of foreign body (FB) penetration into the orbit is a relatively uncommon type of injury. FBs can be classified as either organic or inorganic, and they may remain asymptomatic within the orbit or result in significant complications such as cellulitis, optic neuropathy, and ocular dismotility. Asymptomatic inorganic FBs can often be monitored without the necessity for surgical intervention. When contemplating surgical removal, it is essential to consider the potential complications associated with the procedure, as well as the composition of the FB and its possible effects on the intraorbital environment. This report reviews the clinical characteristics and management outcomes of a cohort of patients who underwent orbitotomy for the removal of FBs.Intraorbital foreign bodies are primarily composed of inorganic and metallic materials, with a notably higher prevalence among young males. Although orbital cellulitis is generally linked to organic foreign bodies, it may also occur due to metallic items that breach the lacrimal sac or paranasal sinuses. By employing suitable precautions, the extraction of intraorbital foreign bodies can be performed effectively and safely through contemporary orbitotomy methods

Keywords: Foreign body; Computed tomography; Glasgow Coma Scale; Orbital imaging

1. Introduction

A case report is presented involving a 38-year-old male who arrived at the emergency room with pain in his right eye following an occupational accident with a stone cutting machine. The initial evaluation indicated a Glasgow Coma Scale (GCS) score of 14. Signs of trauma included a full-thickness globe perforation with an intraocular foreign body (IOFB), indicative of an open globe injury. The visual acuity in the right eye was recorded as no light perception. A computed tomography (CT) scan identified a curved metal object lodged horizontally in the right orbit, penetrating the full thickness of the eyeball. The foreign body was surgically removed through wound exploration under general anesthesia. Postoperatively, the patient showed recovery, although his visual acuity remained at no perception of light. The patient was treated with intravenous antibiotics, topical antibiotics, and steroid drops, which were gradually tapered over a period of four weeks. The patient underwent surgery for an intraorbital foreign body (FB), and all relevant records were meticulously reviewed. The analyzed data encompassed age, gender, the interval between injury and surgery, characteristics of the FB, occurrence of globe perforation, visual acuity, surgical technique, management outcomes, complications, and duration of follow-up. Patients with intraorbital FBs for whom surgical intervention was deemed unnecessary, or those with FBs situated superficially beneath the eyelid skin or conjunctiva, were excluded from the study. Each patient received a comprehensive eye examination. Orbital imaging was conducted to ascertain the location and other characteristics of the FB. Computed tomography (CT) was utilized for injuries involving metallic FBs, while magnetic resonance imaging (MRI) was preferred for organic FBs. The surgical approach for FB removal was determined by the FB's location within the orbit. All procedures were performed by the same surgeon

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Figure 1 X-ray skull lateral view, with foreign body (sickle shape) in right orbit

Figure 2 X-ray skull AP view showing foreign body lodged horizontally in right orbit

Figure 3 CT skull coronal section shows metallic foreign body lodged in right eye ball

Figure 4 Saggital CT of 38yr old male showing right intraocular foreign body

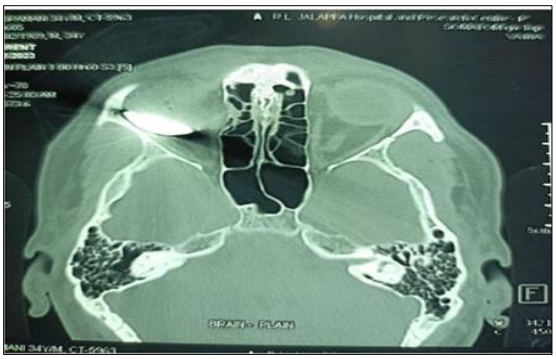

Figure 5 Axial CT image showing right intraocular foreign body

Figure 6 3D reconstruction of CT skull showing better visualisation of foreign body in right orbit (arrow)

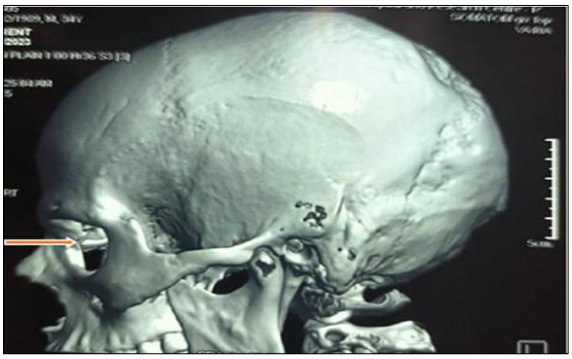

Figure 7 3D reconstruction of CT skull shows foreign body in right orbit (arrow)

Figure 8 Initial presentation of patient to emergency room showing right open globe injury with intraocular foreign body

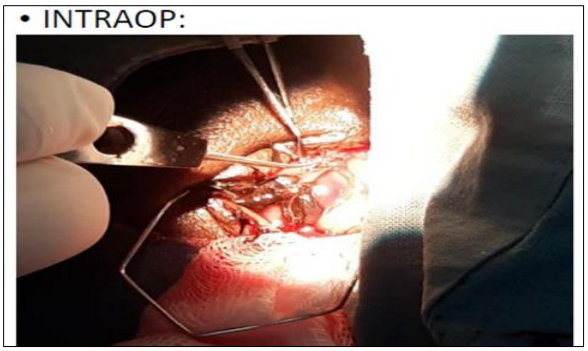

Figure 9 Intra operative image showing wound exploration and foreign body removal under GA

Figure 10 Curved metallic foreign body removed from right eye measuring 4 cms

Figure 11 Post-operative day 1, showing chemosis and congestion of right eye intraocular details not seen clearly , with no PL

Figure 12 Post-operative day 2, Slit lamp image showing continuous corneal and scleral sutures

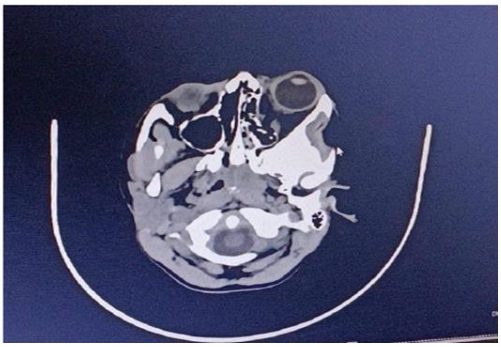

Figure 13 Post-operative day 2 Axial CT showing right collapsed globe after wound exploration and foreign body removal

2. Discussion

A comprehensive search of PubMed identified five studies published in English over the past 18 years that examined the outcomes of surgical removal of intraorbital foreign bodies (FBs) (see Fig 1). The number of patients across these studies varied from 19 to 53, totaling 162 participants. Three of the studies focused exclusively on patients who underwent surgery for intraorbital FB removal, excluding those who did not have surgical intervention, similar to the current study[1]. Two studies were conducted at a single medical center, while the remaining studies included patients from multiple institutions. Additionally, three studies concentrated solely on metallic or organic FBs, whereas the other two encompassed all types of foreign materials. Consistent with previous research, the majority of patients with intraorbital FBs in the current study were young men of working age, accounting for 54% of the cases[2]. In this study, 79% of the intraorbital FBs were classified as inorganic, with 54% being metallic. These figures compare to 81% and 66%, and 67% and 55% reported in earlier studies. The incidence of globe perforation in previous studies ranged from 0% to 20%, while it was recorded at 8% in the present study. Notably, this rate was significantly higher in studies that included patients with retained intraorbital FBs, reaching 44% and 20%. While most metals are considered inert, certain types, such as iron, copper, and lead, can lead to severe complications[3]. The location and size of metallic FBs, along with their chemical composition, are critical factors. Typically, small, inert, and deeply embedded metallic objects are managed conservatively. However, ferromagnetic FBs left in the orbit may hinder patients from undergoing MRI scans in the future[4]. Although these materials can remain benign for extended periods, they pose a risk of serious ocular injuries when subjected to strong magnetic fields. Unfortunately, imaging techniques are unable to distinguish between the metallurgical and magnetic characteristics of metallic FBs. One study indicated that a majority of metallic intraorbital FBs contained steel, categorizing them as ferromagnetic[5].

3. Conclusion

Intraorbital foreign bodies are typically inorganic and metallic in nature, with a higher incidence observed among young males**.**

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

An informed consent was obtained from all individual participants included in the study.

Statement of Ethical approval

Institutional ethical clearance was obtained as per the standards

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