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The Iceberg's Tip, Huge Metal Intraocular Foreign Body: A Case Report

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Abstract: *Background:* Ocular trauma is one of the primary leading causes of blindness in both developed and developing countries. This kind of trauma carries an economic and social burden worldwide because this type of injury frequently causes severe visual loss, even globe enucleation in extreme cases. *Case presentation:* We report a case of a 40-year-old man who presented to the ophthalmology department with an eight-day history of foreign body sensation, red eye, and tears on his left eye after using a polishing machine without protection glasses. Best-corrected visual acuity on the left eye was counting fingers at 30 cm. An ultrasound exam and surgical intervention revealed an impressive finding. Complete features of this case are about to be discovered in the following report. *Conclusions:* Given the high prevalence of ocular trauma and the high risk of intraocular foreign body, a prompt and thorough ophthalmological examination should be performed to provide patients with a quick and effective treatment to try to prevent a fatal outcome in visual health, which brings with it permanent damage to visual acuity, and it can lead to deterioration of life quality. Emphasizing the importance of eye protection as the primary prevention to preserve visual health and avoid ocular trauma.

Keywords: Intra-ocular Foreign Body, Case Report, Pupil Dilatation, Eye Injury, Vitrectomy

1. Introduction

Ocular globe trauma is the leading cause of monocular blindness worldwide. [1] About 16% of the reported cases of ocular trauma found in the literature are associated with Intraocular foreign bodies (IOFBs) [2, 3]. When listing risk factors for ocular trauma is essential to include young age, male gender, lower socioeconomic status, and various work-related activities, especially those that need eye protection [4–6].

External and internal factors determine visual function prognosis in IOFBs. External factors include the environment where the injury occurred, the use of protective eyewear, the location of the IOFB, and objects leading to the damage. Internal factors include medical history, especially a history of ocular surgery. [2, 6] In severe cases, the morphology of the eyeball can't be maintained, leading to phthisis, requiring enucleation. [1, 7] Even when the eye's anatomy is supported, injuries from the central cornea to the optic nerve cause the most severe visual dysfunction. [8–10].

2. Case Report

A 40 years old male patient with no medical history, who was admitted to ophthalmology service, referring to a foreign body sensation, red-eye, and tearing eight days ago, after using a polishing machine without eye protection. Physical examination: Best-corrected visual acuity (BCVA) Right eye (RE): 20/25 Left eye (LE): Finger Count 30 centimeters;

Biomicroscopy (RE): Normal anterior segment, (LE) corneal wound sealed 2 mm, rupture of pupillary sphincter hour 5, small metal foreign body in the iris, rupture of anterior capsule, traumatic cataract (figure 1). Fundoscopy (RE): Normal, (LE): not visible. An ocular ultrasound (US) was performed, which showed a metallic IOFB in the posterior segment and detected no other foreign body and traumatic cataract.

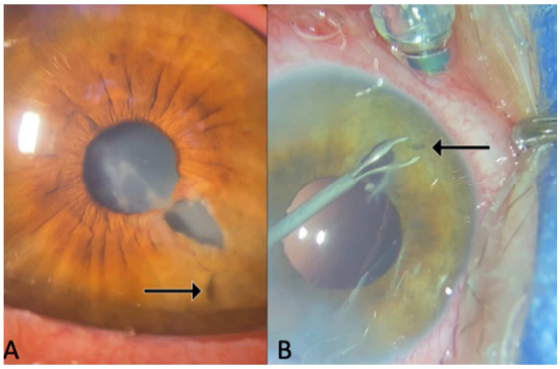

Figure 1. *Slit Lamp photographs of the left eye. (A) Slit Lamp examination revealed a tip of a metallic foreign body that breaks through the cornea creating a sealed wound. The arrow points out a metallic intraocular foreign body associated with rupture of the pupillary sphincter, anterior capsule rupture, and traumatic cataract. (B) Reveals an intraocular foreign body in the anterior chamber.*

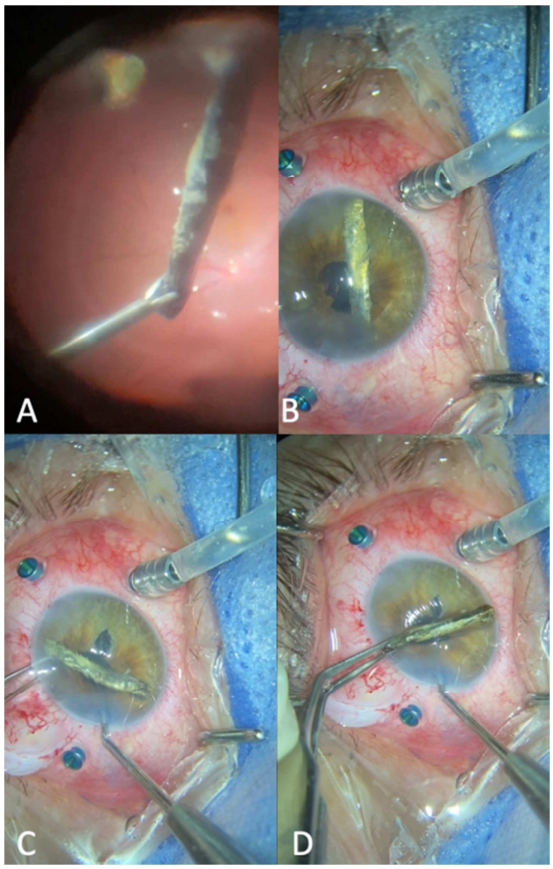

Figure 2. *Intraoperative photographs of the left eye. (A) you can appreciate a giant metallic foreign body in the vitreous cavity without macular compromise perfluoro carbon is used for macular protection. (B-D) The foreign body is mobilized to the anterior chamber; finding a 13mm long foreign body, the principal incision is widened to attract the foreign body.*

The patient is taken to a surgical procedure for phacoemulsification of the crystalline lens + posterior vitrectomy + removal of metallic IOFB + scleral buckle + silicone oil insertion in LE. Intraoperatively, posterior capsule rupture is observed with a giant tear, metallic IOFB of 12 mm x 2 mm, retinal detachment inferotemporal. It is described as the performance of linear or l-shaped sclerotome for removing such IOFB. However, the thickness of the huge metallic foreign body is brought to the anterior chamber (figure 2). Therefore the main incision is enlarged for its removal, always taking care of the endothelium. The patient should be given anti-tetanus prophylaxis and post-operative broad-spectrum antibiotics. A 5-month follow-up, achieved complete resolution, no infection and no change in BCVA and fundoscopy.

3. Discussion

IOFBs are a severe problem for the young working-age population worldwide. Open-globe injuries associated with metallic IOFB may result in devastating tissue disruption and severe visual loss. The previously reported incidents of IOFB in the general population is 0.27% [11] and ranges from 16% to 41% in open globe injuries [7, 12]. Most posttraumatic IOFBs reside in the posterior segment (58-88%), while the others are in the anterior chamber (10-15%) or the lens (2-8%). [7, 12, 13].

The energy transmitted to the eyeball by an IOFB is directly proportional to its mass and velocity [6, 9, 14]. As the IOFB size increases, its volume and mass also increase proportionally. The high proportion of posterior segment IOFBs in the current study (73.1%) may be attributed to the larger IOFB size. [7, 8].

The timing of IOFB removal depends on several factors, including the patient's general medical status, the composition of the IOFB, the nature of the injury, and the availability of operating equipment and trained personnel. If clinical signs of endophthalmitis are present, globe repair with immediate IOFB removal is almost always recommended, except when a simultaneous life-threatening injury precludes ophthalmic surgery [9].

IOFB location also significantly influenced visual outcomes, as the presence of IOFBs in the posterior segment of the eye was associated with poorer visual outcomes in subjects. [8, 9] IOFBs in the posterior segment damage the retina and cause irreversible vision loss when the macula and papillomacular bundle are involved. However, Anguita et al. adopted the opposite view, concluding that IOFB location was not significantly associated with visual outcomes. [8].

Poor visual function prognosis due to foreign bodies in the eye is associated with age (>50 years), low visual acuity before the trauma, retinal tear, infections like endophthalmitis, vitreous surgery, and intraoperative C3F8 gas tamponade use [2, 13]. There was no reported link between foreign body size and visual function prognosis, although minor to 4 mm wounds are associated with improved visual function prognosis. [15, 16]

4. Conclusion

Should sift through eye trauma to exclude intraocular foreign bodies. Asymptomatic posterior chamber foreign bodies may also cause potential posttraumatic endophthalmitis and OS, which should be carefully examined and extracted using appropriate surgical methods to avoid iatrogenic injury. However, diagnosing and managing a retained IOFB is frequently challenging for the treating ophthalmologist. In patients who present early, clinical suspicion and appropriate imaging may be conclusive in most cases. However, a late presentation with a vague history of trivial trauma can be challenging. Furthermore, it should not delay the therapeutic approach to avoid possible complications.

Consent

A well-written informed consent was obtained from the patient, along with the approval of the institutional ethics committee. An explicit written consent regarding publishing the photographs was taken from the patient.

Conflicts of Interest

The authors declare that there is no conflict of interest.

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