CASE REPORT
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Spontaneous extrusion of a missed intraocular foreign body

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ABSTRACT

Intraocular foreign bodies can severely damage the eye and lead to secondary complications, including blindness. They are a significant cause of workplace-related injuries. Besides obtaining a detailed history of the mechanism of injury, the workup should include visual acuity documentation and a thorough examination of the eyes. A high index of suspicion should be present in cases of high-speed injuries without safety glasses. Imaging studies such as X-ray, computed tomography (CT) scan, and ultrasound should be carried out to rule out the presence of an intraocular foreign body. A missed intraocular foreign body may lead to secondary complications, including blindness. We present the case of an unfortunate young man, where the initial foreign body was missed, resulting in secondary blindness. A 7-mm metallic wire was found slowly extruding from the eye two years after the original injury.

KEY WORDS: intraocular foreign body; ocular trauma; blindness; imaging

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INTRODUCTION

Intraocular foreign bodies (IOFBs) can severely damage the eye and lead to secondary complications, including blindness. They are a significant cause of workplace-related injuries [1, 2]. This case demonstrates the importance of safety glasses in preventing high-speed eye injuries [3].

Intraocular foreign bodies may be classified in a number of ways, including the material of the foreign body, its location and point of entry within the eye, and the chronicity of the injury [1]. The most common IOFBs are metallic; however, non-metallic objects such as glass, plastic, plexiglass, or wood are also reported in the literature. The location of the IOFB may be described as an anterior or posterior segment or embedded within the sclera. The point of entry of the IOFB may be classified as zone 1 (cornea), zone 2 (sclera within 5 mm of the limbus) or zone 3 (> 5 mm posterior to the limbus). The chronicity of the injury may also be important in determining whether the object should be removed or not [2]. A missed IOFB may be suspected in chronic cases based on a history of cataract formation, retinal detachment, glaucoma, or chronic inflammation [4].

We present the case of a young man with a 2-year history of a metallic IOFB that was missed, resulting in secondary blindness.

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CASE REPORT

A 23-year-old male was presented to the Emergency Department of Thunder Bay Regional Health Sciences Centre, Canada, with a painful, red left eye. He was subsequently referred for a complete ophthalmic examination.

The patient had recently moved to Thunder Bay from a larger city. His ocular history was significant, with a previous injury to his left eye two years prior. He was working with a wire brush on a high-speed grinder and felt something lodge into his eye. He was not wearing safety glasses at the time of the injury. X-ray imaging carried out at the time showed a small wire fragment in the anterior segment of the eye. The metallic foreign body was removed, but he presented with a cataract in his left eye one month later with counting fingers visual acuity. The dislocated lens was removed with pars plana vitrectomy. Seven days after the removal of his cataract, he presented with a retinal detachment in the same eye secondary to a giant retinal tear encompassing 180 degrees of the superior retina. At the time of examination by the second retina specialist, a very small residual rust ring was noted at the 9 o'clock position in the left eye. No further imaging was carried out at this time. The patient underwent pars plana vitrectomy and retinal detachment repair with the vitreous cavity filled with silicon oil. One week later, he lost vision in his eye once again and was found to have a recurrent retinal detachment. The patient elected not to have further surgery. He was treated for post-operative glaucoma with topical drops (latanoprost, 0.005%). He subsequently lost all vision in his left eye.

Following his presentation at Thunder Bay Regional Health Sciences Centre two years after his initial injury, the patient underwent a complete eye examination. The visual acuities were 20/20 and no light perception (NLP) in his right and left eyes, respectively. Intraocular pressures were recorded as 15 and 12 mm Hg in the right and left eyes, respectively. The anterior segment and dilated examination of his right eye were within normal limits. The anterior segment revealed an extruding black metallic foreign body at the 9 o'clock position at the limbus. The foreign body extruded out of the eye by approximately 1 mm (Fig. 1). Although it was tempting to remove the extruded fragment, it was equally important to assess the actual dimensions of the foreign body. An X-ray (postero-anterior and lateral views) and computed tomography (CT) of the orbits were carried out. Surprisingly, the X-ray showed a distinct 7-mm wire filament lodged within the eye (Fig. 2A).

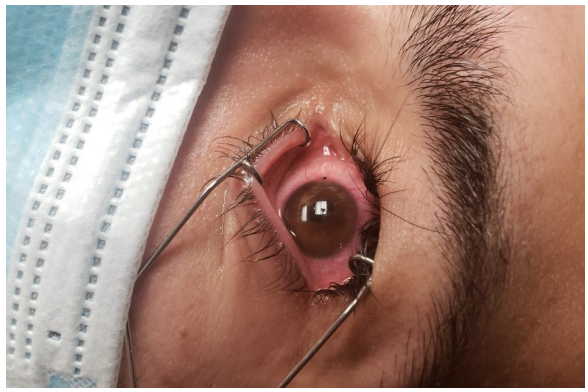

FIGURE 1. External view of the left eye on initial presentation

The CT scan revealed the presence of a metallic foreign body; however, the dimensions were not clear from this imaging study alone (Fig. 2B).

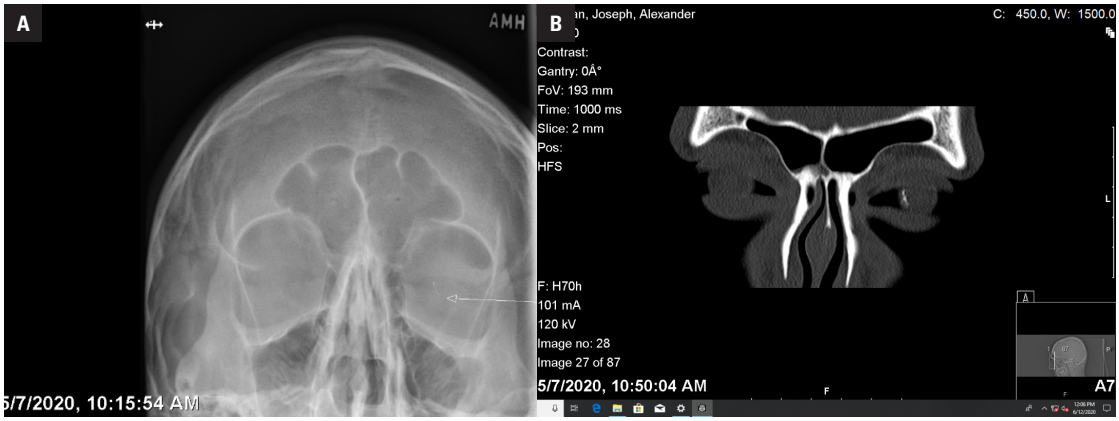

FIGURE 2. A. X-ray of the face shows the intraocular foreign body (indicated by arrow). **B.** Computed tomography (CT) scan of the skull shows the presence of the intraocular foreign body

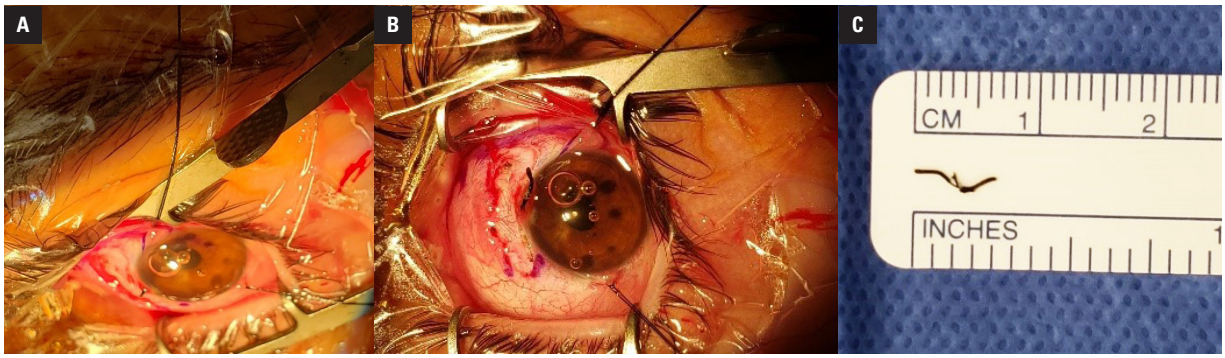

FIGURE 3. A. Side view of the left eye showing extruding foreign body. **B.** Partially removed foreign body. **C.** Intraocular foreign body completely removed measuring 7 mm

After informed consent was obtained, the patient was brought into the operating room and placed under general anaesthesia. The eye was prepared with povidone-iodine solution (5%), the eyelids retracted with cotton swabs, and breathable, adhesive dressing (OPSITE®) was applied. A Mellinger speculum was used to retract the eyelids. There was a clear view of the 1 mm protrusion of the embedded foreign body (Fig. 3A).

4-0 silk sutures were placed at the limbus, at the 12 o'clock and 6 o'clock positions, to retract the eye laterally. A paracentesis was carried out at the 8 o'clock position, and a combination of sodium hyaluronate and chondroitin sulfate (Viscoat®) was instilled into the anterior chamber to pressurize the eye. A conjunctival peritomy was carried out from the 8 o'clock position to the 11 o'clock position to expose the area surrounding the extruded metallic foreign body. An 18-gauge blunt needle was carefully placed over the metallic object and rotated several times to loosen the surrounding tissue. A right-angled mosquito snap was carefully placed over the extruded part of the foreign body, and the foreign body was retracted upwards. After every two millimeters of extrusion, the mosquito snap was released and re-attached to a lower section of the foreign body (Fig. 3B). After three extraction steps, the foreign body was removed in its entirety. The conjunctiva was sutured using four 8-0 Vicryl interrupted sutures, Viscoat® was removed from the anterior chamber using automated irrigation-aspiration, and the 4-0 silk retraction sutures were removed. The eye was patched, and the patient was brought out of general anaesthesia. After removal, the foreign body was carefully measured, confirming its predicted size of 7 mm (Fig. 3C).

DISCUSSION

There should be a high index of suspicion when approached with a patient with a history of high-speed injury and a lack of safety glasses [5, 6]. The workup should begin with a careful history, determining the exact mechanism of the injury. This should include the distance of the patient from the source of the high-speed object and an estimate of the velocity of impact. The visual acuity in both eyes should be documented, and a thorough exam of the eyes should be carried out to detect any points of entry. Imaging studies, including X-ray, CT scan, and ultrasound — where available — should be used to rule out the possibility of an IOFB [1, 2]. X-rays are useful for the detection of metallic foreign bodies; however, 60% of non-metallic foreign bodies may be missed by using X-ray imaging alone [1, 2]. CT scans are useful in detecting non-metallic and metallic foreign bodies, but the estimation of foreign body size may be difficult compared to X-ray imaging. Ultrasounds are very useful for small foreign objects; however, special training is required to carry out a proper orbital ultrasound. For rotating wire brush injuries to the eye, the Ocular Trauma Score has been used to predict the visual prognosis [7].

In this case, the intraocular foreign body was only partially removed, leading to multiple surgeries and eventual loss of vision. It is difficult to predict whether earlier detection of the embedded IOFB would have led to a better outcome. If the IOFB were detected shortly after the initial injury, it is likely that efforts would have been made to remove it prior to other surgical interventions. This case demonstrates the need for a high index of suspicion for intraocular foreign bodies in a patient with a history of high-speed injury. Missing such foreign bodies can

lead to poor visual outcomes and even blindness due to the secondary effects of a retained foreign body.

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