CASE REPORT

An overview of penetrating ocular trauma with retained intraocular foreign body

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Received 6 November 2010; revised 1 January 2011; accepted 2 January 2011
Available online 11 January 2011

KEYWORDS
Penetrating trauma;
Ruptured globe;
Vitreous haemorrhage;
Intraocular foreign body;
Primary repair

Abstract Penetrating trauma is one of the common causes of ocular morbidity world wide. Violation of the globe integrity, also known as a ruptured globe is an ocular emergency that universally threatens vision. Prompt recognition and management is prudent. Here we report a case of a 26-year-old-female, university teacher, who presented with pain and sudden loss of vision in the left eye of 2 h duration subsequent to a test tube blast in the chemical laboratory. Examinations revealed a ruptured globe with vitreous haemorrhage and an intraocular glass foreign body in the left eye. Primary repair was done with good post operative visual recovery. We report this case to emphasize that protective measures should be taken to prevent such eye traumas.

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1. Introduction
Eye injuries are common presentations to the emergency department. There are an estimated 203,000 cases of open globe injuries worldwide each year (Schmidt et al., 2008). More than 90 percent of these injuries occur in male teenagers and young adults. In children, up to 14% of ocular traumatic injuries results in severe vision loss or permanent blindness (Lee et al., 2009). It is estimated that as many as 40% of globe rupture is associated with retained intraocular foreign bodies (Dejuan et al., 1983) that are mostly metallic and less commonly glass (Williams et al., 1988; Imrie et al., 2008; Murillo-Lopez et al., 2002).

When evaluating a patient with suspected globe rupture, it is important to manage concomitant injuries by trauma protocols. A history of high velocity, blunt force or sharp object contact mechanisms are concerns for globe rupture. Visual acuity and an examination of the orbit should be performed to identify any corneal or scleral laceration, a deflated globe, an irregular pupil, pupillary response to direct and concentric maneuvers, 360-degree subconjunctival haemorrhage, notation of obvious protruding foreign bodies, or obvious intraocular contents extravasating from the wound. Care should be taken to decrease iatrogenic increase in intraocular pressure while examining the orbit, so Tonopen evaluation should be deferred.
Computerized tomography (CT) with thin (1–1.5 mm) cuts to evaluate the orbit and identify radiolucent foreign bodies should be performed emergently.

Patients with suspected globe rupture should be considered preoperative, appropriate laboratory evaluation performed, and ‘nothing by mouth’ status maintained. After evaluation, a protective hard eye patch should be placed to prevent further injury.

For patients who require intubation in emergency for concomitant injuries, the use of ketamine (Dana et al., 2007) and succinylcholine (Chidiac and Raiskin, 2006) are contraindicated because of the potential to elevate intraocular pressure. Broad-spectrum intravenous antibiotics and tetanus should be given prophylactically for any ruptured globe because of the risk of endophthalmitis. Intraocular foreign bodies increase the risk of the ocular infection to as much as 13% (Mieler et al., 1990).

The primary aim is to maintain the anatomical integrity of the eye ball as soon as possible. We describe a case of penetrating trauma with retained glass intraocular foreign body.

2. Case report

A 26-year-old-female not known to have any significant medical or surgical history presented in the emergency room with 2 h history of pain and loss of vision in the left eye subsequent to a test tube blast in the chemical laboratory.

On examination, her visual acuity was perception of light with an accurate projection and there was a corneoscleral tear at 10 o’clock involving the limbus and extending about 4 mm into the sclera with uveal prolapse. There was mild corneal edema with a shallow anterior chamber and the pupil was drawn towards the wound. Fundus details were not clear due to corneal edema and vitreous haemorrhage. CT scan of the left eye showed 4 intraocular foreign bodies, the largest being 3.5 mm (Fig. 1). One foreign body was embedded in the lens zonules and one in the retina. USG B scan also showed a foreign body in the vitreous and in the retina (Fig. 2). Examination of the right eye was unremarkable.
Corneoscleral tear was repaired under general anesthesia and her postoperative course was uneventful. Postoperatively she received topical steroids and antibiotics. Vitreoretinal surgeon was consulted for the management of IOFB but he was advised not to remove the glass foreign bodies as these were inert and he was advised to monitor the patient closely.

At present, after eight months of follow up, her BCVA in the left eye is 20/40 and in right eye is 20/20. There is a lenticonular opacity in the periphery at 10 o’clock position. Her fundus examination in the left eye shows a normal posterior pole, there are foreign bodies in the vitreous and one foreign body is embedded in the retina superonasally.

3. Discussion

Penetrating trauma is quite a common presentation in the emergency room (Schmidt et al., 2008) and it is an important cause of ocular morbidity. Prompt recognition and management is necessary. Careful assessment of the damage caused should be analyzed and the trauma should be classified according to the ocular trauma classification group, (Pieramici et al., 1997) which includes; mechanism of injury, initial visual acuity, pupillary involvement and mostly posterior location of the wound. High suspicion of IOFB should be kept in mind as it is associated with 40% of globe ruptures (Dejuan et al., 1983).

Following penetrating trauma, patients with poor prognosis tend to be those with a poor vision on presentation (<5/200), ocular laceration 4 mm or greater in length (Williams et al., 1988), those with lens disruption (increased risk of endophthalmitis) (Pieramici et al., 1997), significant orbital/periorbital trauma, prolonged time to primary closure, metallic foreign body (Justis et al., 2008) and those with endophthalmitis (Pieramici et al., 1997).

The primary aim in ocular trauma is to maintain the anatomical integrity of the eyeball as soon as possible. If there is retained IOFB, specially metallic and wood should be removed (Justis et al., 2008) with the help of a vitreoretinal surgeon because these foreign bodies are reactive and may cause irreversible ocular damage in the long run. Some foreign bodies like glass and plastic are inert and can be left in situ (Craig et al., 2000) and patient can be monitored closely.

In the present case, four intraocular glass foreign bodies were identified. Only primary repair of corneoscleral laceration was done and the patient was followed closely for eight months. At present, these glass foreign bodies are inert and the vitreoretinal surgeon also advised not to remove these foreign bodies.

Here we want to emphasize the importance of preventive measures to decrease serious ocular morbidity following ocular injuries. The very purpose of writing this case report is to highlight the importance of the use of protective eye goggles, eye shields etc., in hazardous occupations. Actually legislative measures are required to be taken in this direction.

References