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SHORT COMMUNICATION

Case report

Traumatic eye injuries due to large unusual foreign bodies: a Singapore case series

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PURPOSE. *Traumatic eye injuries due to large foreign bodies (FB) are rare. The visual prognosis is often poor in these cases because of severe ocular damage. Staged surgical procedures with eventual enucleation or evisceration are often indicated.*
METHODS. *Case series.*
RESULTS. *The authors describe two patients with eye injury due to large FB with visual acuity of no light perception at presentation. Both had initial repair of the ocular injuries and removal of the FB. One patient with an intraocular FB eventually underwent enucleation; the other, with intraorbital FB, had evisceration as a secondary procedure. Orbital implantations were done in both. Neither of the patients had developed sympathetic ophthalmia at the last review.*
CONCLUSIONS. *The visual outcome of eye injuries due to large FB is poor. Both enucleation and evisceration can be performed with low risk of sympathetic ophthalmia. Prevention remains the best approach to such devastating injuries. (Eur J Ophthalmol 2003; 13: 398-402)*

KEY WORDS. *Large foreign body, Enucleation, Evisceration, Sympathetic ophthalmia*

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INTRODUCTION

In the Singapore population, many foreign body (FB)–related eye injuries are work-related injuries (1). Eye injuries due to large FB are often severe with a poor visual outcome (2). They are associated with extensive and serious damage to various intraocular structures and ocular adnexa. The initial steps to remove the FB and to repair the ocular damage are difficult and do not improve vision. Some of these patients will eventually require enucleation or evisceration to rehabilitate a painful blind eye, which is often phthisical.

We describe the clinical courses of two patients with traumatic eye injuries due to large FB.

Case 1

A 34-year-old grass-cutter presented to our center in November 2000 after sustaining a severe left eye injury. His left eye had been hit by a stone that was propelled off the blade of a grass-cutter. He was not wearing any protective eyewear at the time of injury.

On examination, his visual acuity was 6/9 in the right eye and no light perception (NLP) in the left. There was a large full-thickness left corneo-scleral laceration from 7 o’clock to 11 o’clock position with iris prolapse. The anterior chamber was flat with total hyphema. There was no left fundal view but orbital x-ray (Fig. 1) revealed a large radio-opaque FB occupying almost three-

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Fig. 1 - *Plain radiograph of the left orbit (anterior-posterior view) of Case 1 showing a large radio-opaque foreign body.*

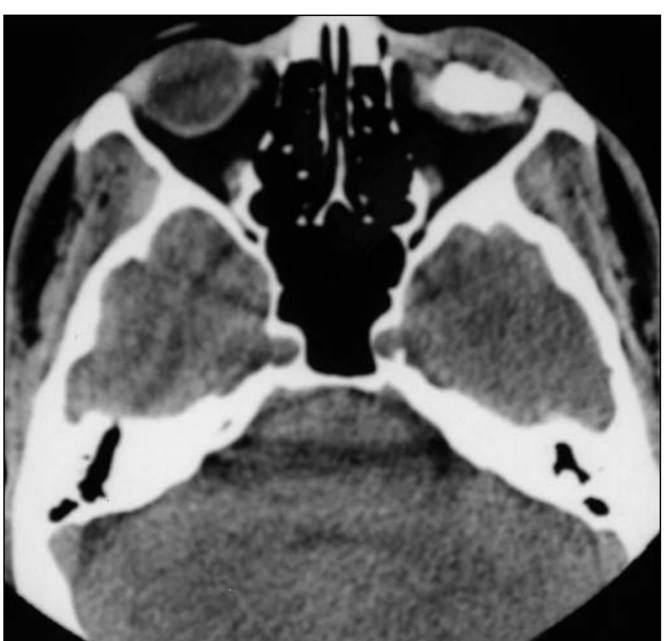

Fig. 2 - *Axial computerized tomography showing the same foreign body as in Figure 1.*

quarters of his left orbit. Computerized tomography (Fig. 2) revealed a large 1.8 x 1.0 x 1.0 cm radio-opaque FB within the left globe. Pockets of gas were seen within the left globe. The posterior margin of the left globe, the extraocular muscles, and the left optic nerve were intact. The right eye was normal on examination.

The patient underwent an urgent repair of the left corneo-scleral laceration with removal of the FB (a stone) (Fig. 3). Secondary enucleation of the left globe with orbital implantation was done 11 days later and ocular prosthesis was fitted in January 2001. At the eighth postoperative month, there was no evidence of sympathetic ophthalmia (SO). The superior and inferior conjunctival fornices were adequate. He had good fitting of the prosthesis with good cosmesis and reasonable motility.

Case 2

A 37-year-old man was seen in the emergency department in June 2001 for right eye trauma. His right eye had been hit by a valve that was accidentally ejected from a high-pressure gas pipe. He did not wear any protective eyewear at work.

On examination, his visual acuity was NLP in the right eye and 6/6 in the left. There was a reverse relative afferent pupillary defect. A 2 cm x 1 cm full-thickness entry wound was noted on the supero-nasal aspect of the upper lid. There was total hyphema with severe subconjunctival hemorrhage and chemosis. Orbital x-ray (Fig. 4) revealed a radio-opaque FB. An urgent computerized tomography (Fig. 5) revealed a large disc-shaped FB measuring 2 cm in diameter lodged between the right globe and right ethmoid bone. The globe was deformed, possibly from a globe rupture. Fractures were also noted in the right lamina papyracea and the adjacent ethmoidal lamellae.

The patient underwent an emergency operation to remove the intraorbital FB (Fig. 6) via the entry wound. The large scleral laceration was also repaired concomitantly. The vision in his left eye remained NLP. Evisceration of the right globe with the placement of an orbital implant (size 18) was performed 5 days later. An ocular prosthesis was fitted in the fourth postoperative month. At the twelfth postoperative month, the patient had not developed SO. His left socket was clean with satisfactory fitting and motility of the prosthesis. The conjunctiva was well healed with deep fornices.

Fig. 3 - *Foreign body (stone) removed surgically from Case 1.*

Fig. 4 - *Plain radiograph of the right orbit (anterior-posterior view) of Case 2 showing a large foreign body.*

Fig. 5 - *Coronal computerized tomography showing the large foreign body found between the right globe and the medial orbital wall of Case 2.*

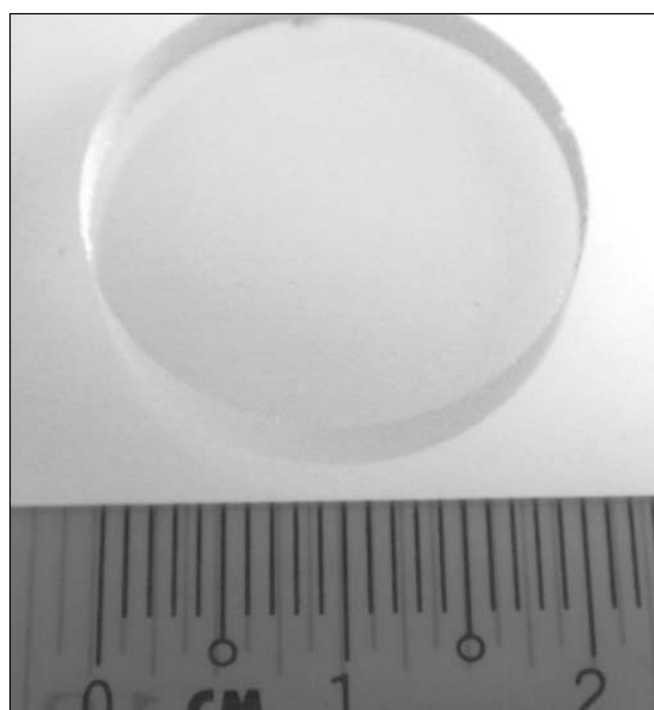

Fig. 6 - *Postoperative photograph of the foreign body (2-centimeter plastic disc) removed from Case 2.*

DISCUSSION

In Singapore, many ocular injuries are a result of industrial accidents (1), such as in our two patients. Traumatic eye injuries due to large FB usually have very poor visual outcome and are rare (1). The severity of the injuries will depend on the size, location, velocity, and composition of the FB. Nevertheless, the loss of vision is usually the result of the initial trauma and generally not influenced by surgical intervention (2).

The management of such patients requires a careful and detailed examination. Computerized tomography is an important investigation in evaluating such injuries (3). All FB should be thoroughly searched for and removed. Both our patients underwent surgical repair of the ocular injuries and had the FB removed. One had enucleation and the other had evisceration as a secondary procedure. There is always much controversy in deciding between enucleation and evisceration, considering the risk of SO of the latter. Traditionally, early enucleation has been advocated to prevent SO or to improve the prognosis for the sympathizing eye (4).

As compared to enucleation, evisceration has the advantages of a shorter operation time, less disruption of the orbital anatomy and physiology, better cosmesis, greater socket mobility (which may be transmitted to the prosthesis), and less postoperative complications (5). A faster operation may be advantageous in medically unfit or compromised patients who may not tolerate long procedural times. Many surgeons argue that evisceration entails a higher risk of SO due to incomplete removal of all uveal tissue. The incidence of SO after penetrating ocular injury varies from 0.28% to 3.1% (4) with some authors reporting zero incidence of SO (6). Some surgeons comment that the extreme rarity of SO does not warrant an enucleation and that even if SO develops, it is often controllable with immunosuppressive treatment (7). Kilmartin et al (8) reported patients with SO with good visual outcomes at 1 year with immunosuppresvie therapy.

The decision between enucleation and evisceration in a blind, severely traumatized globe is often based on the training, experience, and preference of the surgeon. The optimal management is controversial. Prophylactic primary enucleation in an unsalvageable eye after perforating injury may not be mandatory (9). In our experience, the initial injury and visual loss often constitute significant psychological trauma and stress to the patient; many will not be emotionally prepared to have primary enucleation or evisceration. We believe that the patient will be more at ease to discuss and give informed consent for these surgeries at a later stage.

The period within which enucleation should be performed to prevent SO is unknown, although some authors believe that it should be done within 14 days after the injury (9). Evisceration seems to be an effective and safe procedure with a low risk of SO (10). A survey by Levine et al (10) revealed enucleation to be the preferred procedure by many surgeons, although there is no histologic or clinical evidence of SO after evisceration. Bilyk (11) cautioned that no conclusive evidence may be drawn from studies (10, 12) on SO and evisceration owing to the rarity of the disease.

Enucleation may be the procedure of choice in patients with penetrating eye injury with severe scleral disruption that makes evisceration difficult and incomplete (5), such as in Case 1. Furthermore, it may also be considered in immunocompromised or immunosuppressed patients, who may not tolerate the treatment of SO if indicated later. Evisceration may be carried out if the integrity of the scleral coat is preserved. Care should be taken to ensure complete removal of the uveal tissue whenever possible. In many cases, however, the choice between evisceration and enucleation is not clearly defined. The patient should be informed of the pros and cons of both procedures before making a final joint decision with the attending surgeon.

CONCLUSIONS

Traumatic eye injuries due to large FB have poor visual outcomes. Prevention may be the only solution. Because many of the cases occur at worksites, the implementation of good occupational eye safety programs is of the utmost importance.

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