

Surgical Treatment of Impalement Injury to the Right Lower Eyelid and Eye Following Explosion of Sharpening Stone

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Abstract: Trauma to the eye is a common sight threatening event. This range from minor trauma to loss of vision from severe structural damage resulting from the injuries. This study is aimed at sharing our experience in the removal of a massive foreign body lodged in the eye after failed attempt at removal. A 48 year old welder who presented with complains of a piece of sharpening stone in his eyes and poor vision of 7 day duration. He was working with a sharpening stone in his iron fabrication industry when the filing stone exploded. A piece of the stone got stuck in the eyes. Examination showed swelling of the right lower eyelid with ecchymosis. There was a scar on the right nasolabial region with a piece of the dark foreign body protruding through the palpebral conjunctiva of the right lower eyelid. There was cornea laceration. Via an inverted 'L' incision a triangular shaped foreign body measuring 2.5 cm by 2.5cm by 2cm was extracted. Wound was closed in layers and subsequent glass rodding done to prevent symblepharon. The inverted 'L' shaped incision offered an adequate access to extract a large foreign body from the eye.

Keywords: Foreign body; Incision; Symblepharon; Cornea; Conjunctiva.

Introduction

Trauma to the eye is a common sight threatening event. This range from minor trauma to loss of vision from severe structural damage resulting from the injuries ^{1, 2}. The prevalence of ocular injuries is estimated to be 14.4% to 19.8% in the United States³. Studies have shown that about 40% of penetrating eye injuries have associated intraocular foreign body^{4, 5}. Eyelid complicated with intraocular foreign body can pose a major challenge from the toxic nature of the foreign

body or the effects of the inflammatory response. The sequelae can be endophthalmitis, sympathetic ophthalmia^{6, 7}. The overall effect negatively impacts the individual's quality of life and productivity.

The main goal of treatment is to preserve the integrity of the globe, restore function and prevent any iatrogenic damage⁹. Where irreversible damage has occurred the goal is to arrest further progression and to prevent damage to the contralateral eye.

This study is aimed at sharing our experience with the removal of a massive foreign body lodged in the eyelid and globe after previous failed attempt at removal.

Case Report

A 48 year old welder who presented to the University of Benin Teaching Hospital, Benin City, Nigeria; with complains of a piece of sharpening stone in his eyes and poor vision of 7 day duration. He was working with a sharpening stone in his iron fabrication industry when the filing stone exploded. A piece of the stone got stuck in the eyes. There was history of pain, tearing and poor vision on the eye. Patient had no injury to any other body part. Patient had no protective eye wear on.

Patient has no known co-morbidity. Does not smoke tobacco but take alcohol occasionally. He presented initially to the ophthalmologists in a tertiary center, who attempted to remove it to no avail before referral to the plastic surgeon who in conjunction with the ophthalmologist removed the foreign body. This prompted referral to the plastic surgical team for expert management.

Examination showed swelling of the right lower eyelid with ecchymosis. There was a healing scar on the right nasolabial region with a piece of the dark foreign body protruding through the palpebral conjunctiva of the right lower eyelid (figure 1). The tip of the foreign body was lodged in the cornea with the other parts extending into the eyelid. There was corneal ulceration with no vision on the right eye and the left was normal vision. There was tenderness over the lower eyelid with a hard mass on the right lower eyelid. A diagnosis of foreign body in the eye was made.

Plain radiographs done showed radiopaque mass in the soft tissue of the right lower eyelid. The hematological investigations and the blood glucose levels were normal. Patient was counseled for surgery using local anesthesia. Patient care clinical conference held between the ophthalmologists and the plastic surgery team on the treatment plan.

Consent was obtained from the patient. Patient was placed supine on the operating table. Cleaning and draping was done. Local anaesthesia was used. Via an inverted 'L' incision which extended from the infra orbital margin 2cm below the orbit (figure 2). This span from lateral lower margin of the eye to the median margin and then down through the nasolabial fold (5cm down the nasolabial fold). This was developed to the subcutaneous tissues using blunt dissection

(figure 3). The foreign body was identified and delivered inferiorly from beneath the lower eyelid (figure 4). The foreign body was triangular measuring 2.5 cm by 2.5cm by 2cm (figure 5). He wound was irrigated. The cornea laceration was repaired by the ophthalmologists. The eyelid was repaired in layers starting from the palpebral conjunctiva laceration (figure 6). The palpebral conjunctiva injury was repaired with vacryl 6/0 with buried stitches. This skin was closed using 6/0 prolene and dressed with chloramphenicol eye ointment based dressing. Glass rodding using a glass thermometer tip lubricated with chloramphenicol eye ointment was done 4 times daily. Wound healed adequately (figure7). There was no vision in the right eye post-surgery. Patient was counseled for corneal transplant and followed up on outpatient basis.

Discussion

Foreign body in the eye is a common occurrence with work related injuries accounting for a greater proportion^{10, 11}. This results when the eye protective measures are not adhered to like wearing of protective goggles¹². In this case this patient was not on proper protective eye wear while doing a welding work. The vast majority of ocular foreign bodies results from metallic and stone fragments¹². The constituent of the sharpening stone extracted from the eye in this index patient had stone and metallic fragments.

The removal of large foreign body can be challenging. This is made worse when previous failed attempts had been made at extracting it. This can result in increased fibrous tissue deposition, inflammation and friability of the tissues and increased chances of damage to the globe. The goal of removal is to limit further damage. The options of incision to access a foreign body depend on the location. Nair and Furniturewala in a report made an incision directly over the lid for proper exposure¹³. The considerations in making an inverted 'L' shaped incision were to create adequate access and to have an aesthetically acceptable scar. The scar through the nasolabial fold was to hide the scar at as well as have enough room for extension of incision.

One of the principles in foreign body removal is to prevent iatrogenic injuries⁹. This informed the choice of extracting inferiorly. The repair of the lid injury was done in layer using buried stitches. This principle of repair prevents abrasion of the sutures on the bulbar conjunctiva¹⁴. Four hourly glass rodding using chloramphenicol ointment as lubricant helps to prevent symblepharon.

Conclusion

The inverted 'L' shaped incision offered an adequate access to extract a large foreign body from the eye with no iatrogenic injury to the globe. Adherence to principles of foreign body removal, repair of cornea and eyelid as well as post-operative glass rodding gave a good outcome.

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Figure 1: showing foreign body in the eye with right lower eyelid oedema and hyperemia.



Figure 2: showing the marking for the inverted 'L' incision



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Figure 3: showing flap elevation and the foreign body insitu (pointed by the tip of the scissors)



Figure 4: Extracted foreign body



Figure 5: Showing foreign body dimension.



Figure 6: showing cornea laceration and a long laceration in the palpebral conjunctiva.



Figure 7: Showing healing wound 5 days post operation