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CASE REPORT

Improving the Care Outcomes of Traumatic Enucleation with Ocular Prosthetics: A Case Report

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Summary

Traumatic enucleation is a rare consequence of high-impact trauma. It is a severe injury leading to permanent loss of vision. One of the most common causes of traumatic globe enucleation is automobile accidents. This damage may severely affect the patient's physical and mental health. Apart from the permanent loss of vision in the affected eye with traumatic enucleation, some complications, including pseudoptosis, orbital infection, haemorrhages, and scarring can occur. Psychological problems like stigma, depression, anxiety, and post-traumatic stress disorder may also complicate traumatic enucleation. Following enucleation, the use of prosthetics may minimize the psychological implications of the structural loss. This case report aims to highlight the potential occurrence of traumatic enucleation following road traffic accidents, as well as the management of such cases, including the use of eye implants.

Keywords: Artificial Eye Implant, Ocular Injury, Post-Traumatic Stress Disorder, Road Traffic Accident, Traumatic Enucleation.

Introduction

Traumatic enucleation is the complete removal of a whole eyeball following trauma. It has an estimated incidence of 12 per 100,000 between 1956 and 1988, as reported in the literature [1]; thus, it is a relatively uncommon injury. Blunt

force trauma, such as occurs in assault, is the most common cause of traumatic ocular injury leading to enucleation.[2,3] Gunshots, stab wounds, motor vehicle accidents (MVA), task-related (including workplace and travel) injuries, recreation, and falls are possible causes of these injuries. [2,4] A predominance of males with a 3:1

male-to-female ratio is self-explicit. [4] However, non-traumatic auto-enucleation had been reported usually in psychiatric or drug-abuse patients. [5,6] Traumatic enucleation requires a significant retro-ocular force to cause globe separation from the surrounding supportive structures within the orbit with complete optic nerve avulsion. [7] This damage may severely affect the patient's physical and mental health. Traumatic enucleation will result in permanent loss of vision in the affected eye [7] and several complications, including pseudoptosis, orbital infection (cellulitis), haemorrhages, and scarring. [8] The purpose of this case report is to illustrate traumatic enucleation as a potential consequence of road traffic accidents and to describe the role of artificial eye implants in the management of such patients.

Case Description

A 35-year-old man presented to the Emergency unit of the Eye clinic at the Bowen University Teaching Hospital, Ogbomoso, Nigeria with a 2-hour history of sustaining injury to the right eye in a road traffic accident. He was a passenger sitting in the front seat (not using a seat belt) in a car trying to overtake a long-articulated truck. In the process, the vehicle collided with the truck from the side, and the car somersaulted many times before falling into a ditch. Passers-by rescued the occupants of the car. There was no loss of consciousness, but there was bleeding from the right eye.

On presentation at the emergency unit, he was conscious and alert. He had a laceration extending across his right upper and lower eyelid, which the casualty officer had already sutured. The entire right eyeball protruded through the eyelid rotated superior-nasally, exposing the avulsed end of the optic nerve inferotemporal (double arrow in the photograph), as shown in Figure 1.



Figure 1: At presentation - Avulsed right optic nerve (arrowed) of the auto-enucleated globe

The eyeball was just held down by the conjunctiva. He was promptly treated with analgesics and antibiotics in the casualty room. He was immediately informed and counselled about the nature and extent of ocular injury, noting that the optic nerve was avulsed already and the process of enucleation needed to be completed. The patient was initially sad and worried about the visual loss and the cosmetic insult arising from the incident. However, he was adequately counselled and reassured of the availability of a prosthetic eye for aesthetic purposes. His fear was allayed, informed consent was obtained, and he subsequently had a procedure to complete the enucleation by excising the remaining conjunctiva holding the globe. He was subsequently discharged home after 48 hours when the inner pack was removed. An orbital implant with an artificial eye was inserted six weeks afterwards, as shown in Figures 2 and 3. The patient was satisfied with the outcome of his care, and he was particularly grateful for the ocular implant.



Figure 2: Six weeks post-operative state with anophthalmic right orbit



Figure 3: Six weeks post-operative state with an artificial eye implant

Discussion

The most common symptoms of traumatic enucleation include sudden loss of vision, extreme pain, oedema, and bleeding from the afflicted eye. Ocular aches and headaches are other typical symptoms that can occur. [7,9] In traumatic enucleation, the mechanism of optic nerve avulsion is not entirely understood. However, several theories have been postulated;

these include direct trauma to the globe, shearing forces resulting from extreme rotation of the globe, a sudden massive increase in intraocular pressure resulting in rupture of lamina cribrosa and expulsion of the globe, sudden forward displacement of the globe, and focal or diffuse vasospasm in the optic nerve. [10,11] Since the injury in the index case occurred in a motor traffic accident in our index case, it is likely to involve a combination of mechanisms.

Traumatic enucleation is managed in various ways depending on the injury's severity and the patient's general health. The index case was managed as an emergency because of the associated pain and bleeding. Enucleation is frequently required in situations where the eyeball has been severed from the surrounding vital tissue, such as the blood and nerve supply; hence, saving the eye is not possible, just as it occurred in the index case. The injury sustained by the index patient was so severe that enucleation was not unavoidable. Knowing that the patient may experience psychological anguish in addition to his physical symptoms which may lower his quality of life, he represented after six weeks for the ocular prosthetics to minimize the stigma of going around with an anophthalmic socket.

The severity of the injury and the patient's general condition are factors that affect the prognosis for patients with traumatic enucleation. However, post-enucleation patients can often anticipate a favourable functional and cosmetic outcome with adequate management. [10] Patients may also develop psychological conditions such as depression, stigma, anxiety, social isolation, and post-traumatic stress disorder, which may lead to suicidal ideation and eventual suicide if they are not resolved in good time. [12] The index patient was on the verge of depression when he received the prosthetic eye after six weeks of the injury. This significantly helped him regain his self-confidence. Patients

may receive prosthetic eyes after enucleation to help them look normal cosmetically again. Artificial eye implants are a successful option for individuals who have suffered traumatic enucleation. The use of these implants can improve the quality of life of affected individuals by increasing their self-esteem and satisfaction with their appearance. [12,13] Orbital Infection, haemorrhage, and scarring are possible complications of enucleation, [10] However, these implants will minimize their effects.

The index patient sustained the injury in a motor vehicular accident because he did not apply the safety/seatbelt as other passengers in the vehicle did not sustain any injury during the accident. The use of safety/seat belts and child restraints in cars has been noted as one of the essential ways of reducing injuries sustained in a motor accident. Hence, compliance with its use should be encouraged. [14,15]

Conclusion

Traumatic enucleation is an uncommon but severe injury that can have severe negative impacts on both the physical and mental health. With prompt and effective management, the impact of the injury sustained can be minimized. The use of car seat belts should be enforced. A comprehensive approach is necessary for the management of this kind of injury to meet the patient's physical and emotional demands. Future studies should concentrate on enhancing the quality of life of people who have had enucleation with artificial implants to create more efficient treatment modalities for this type of injury.

Consent to use data: Informed consent was obtained from the patient for the use of the patient's clinical details and clinical images.

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Authors' Contributions: AOT and AAS conceived and designed the research and drafted the manuscript. All the authors revised the manuscript for sound intellectual content and approved the final version of the manuscript.

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