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Case Report

Traumatic globe subluxation: An overview of two cases, management and literature review

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ABSTRACT

Globe subluxation is an uncommon presentation in the emergency department with the diagnosis usually clinical, the prolapsed globe being visible easing diagnosis. Here, we report two case presentation of globe subluxation. Case 1- A 39 year old female presented with a day history of trauma to the right eye, severe eye pain and anxiety. Examination showed vision was Counting Fingers at 1meter in the right eye and 6/6 in the left eye, right eye lid swelling with the globe displaced anteriorly, conjunctival injection, mild corneal edema, deep anterior chamber, sluggish pupil and poor fundal view. Initial manual reduction attempt was aborted as patient was uncomfortable and uncooperative from pain in the right eye. Further examination with reduction was achieved under general anesthesia. First day post reduction vision was 6/24 with residual hypotropia. Anterior segment showed resolved corneal edema with improved pupillary reaction. She was referred to the strabismus unit for possible strabismus correction but neither honoured said referral nor returned for follow up review. Case 2- A 12 year old pupil presented with a twelve-hour history of trauma to the right globe by a nail, severe eye pain, swelling, loss of vision and anxiety. Upon examination, vision was Counting Fingers at less than three meters. The globe was displaced anteriorly, a nail imprint visible beneath the brow. There was mild corneal epithelial haze and pupil was sluggish. The globe was manually reduced and temporary tarsorrhaphy applied following anaesthesia with topical proparacaine in the conjunctiva and subcutaneous infiltration of xylocaine. Topical Anti-inflammatory, anti-microbial and lubricants were commenced. Eyelid edema resolved and visual acuity improved to 6/24 within 48 hours. Patient steadily improved and by 6th day, Vision was 6/5, with residual subconjunctival hemorrhage, briskly reacting pupil, normal disc and retina findings. At day 14, subconjunctival hemorrhage was completely resolved. Globe subluxation can be very distressing to the patient and can lead to reduction in vision and permanent visual morbidity. Prompt identification and globe reduction leads to good outcome for globe structure and function.

Keywords: Globe reduction, Overview of management, Traumatic globe subluxation

INTRODUCTION

Globe subluxation refers to a condition in which the eyeball gets displaced anteriorly, such that the globe equator extends anterior to the palpebral aperture.[1] The globe is displaced anterior to the bony orbital rim.[2]

It is a fairly uncommon condition, with no sex, race or geographically preferred distribution. The age range of cases is 11 months to 73 years, with a mean of 38 years.[3] It may be spontaneous or traumatic. Voluntary non-traumatic subluxation has also been described.[3] Risk factors may be systemic or ocular. Systemic factors include chronic obstructive pulmonary disease, hypertension, Graves ophthalmopathy, obesity and idiopathic intracranial hypertension. Local ophthalmic factors include orbital tumours, abnormal orbits with proptosis or shallow orbits as in cranial stenosis syndromes, eye manoeuvres such as contact lens insertion, rubbing eyes, valsalva and floppy eyelid syndrome tend to be associated with spontaneous non-traumatic subluxation.[1,3-7] Injury such as road traffic accidents, assault and birth injury are associated with traumatic subluxation.[8-13] Voluntary subluxation has been described, where the globe is expressed anteriorly at will, without a precipitating trigger.[1] Manipulations which spread lids apart may cause posterior pressure against the globe, which triggers advancement of the globe. This advancement dries the cornea, inducing a blink reflex. Orbicularis contraction locks the globe beyond the eyelids, making reduction and further repositioning difficult.[4] This cycle is often acute, unilateral, painful and quite distressing to the patient. Visual acuity (VA) is often reduced, with reduced extraocular muscle excursions. Anterior segment

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may be normal, or with exposure keratopathy in thyroid disease or craniosynostosis syndrome, such as Crouzon, with pupillary abnormality from optic nerve dysfunction. Prompt identification and resolution is of utmost importance due to the risk of optic neuropathy and subsequent permanent visual disability. This could be achieved by reducing anxiety, pain and maintaining moisture over the ocular surface with a moistened piece of gauze. Local topical anaesthesia is used to enable reduction. In some patients, relaxation of the contracted orbicularis may be achieved by regional facial nerve block. General anaesthesia may be used in children. In the Tse manoeuvre, while patient looks downward, the upper lid skin is pinched and pulled upwards, gentle downward and backward digital pressure is applied to the scleral surface of the topically anaesthesised globe with another hand. This pressure is maintained until the equator is behind the eyelids, then patient is instructed to look upwards to complete the reduction as globe slips back in place.[14] Traction to the upper lid may also be by a paper clip or a desmarres retractor. For trauma cases, inspection of the rest of the globe and other injuries is carried out. Temporary tarsorrhaphy is applied. For non-traumatic cases, follow-up evaluation includes computed tomography, orbital imaging and thyroid function tests. Complications include keratitis, optic nerve stretch or avulsion, retinal vascular congestion and damage to extraocular muscle, with these risks increasing with duration of injury.[5,15,16]

We, hereby, report two cases of globe subluxation which both occurred few hours, following trauma to the orbit who both presented within a short interval. The aim of these case reports is to bring this occasional clinical rarity, so ophthalmologists, especially residents who work in the emergency room, will be aware of its occurrence. Ethical approval was obtained from the Research and Ethics Committee of Federal Medical Centre, Asaba, with a reference number of NHREC/TR/FMCASABA-HREC/31/7/24/26.

CASE REPORT

Mrs I.O, a 39-year-old female, presented with a day history of trauma to the right eye (RE) from an iron rod. There was severe pain and anxiety. VA was counting fingers at 1 m (RE) and 6/6 LE. There was lid swelling with the globe displaced anterior to the palpebral aperture with lid margins trapped behind, conjunctival injection, mild corneal oedema, deep AC, sluggish pupil and poor view posteriorly, [Figure 1a].

The initial attempt to reduce manually was aborted as patient was in severe pain. Under general anaesthesia, further examination with reduction was achieved. A stump knuckle of avulsed superior rectus muscle was noted superiorly, initially mimicking an area of blot clot at presentation. First day post-reduction VA was 6/24 with residual hypotropia. Anterior segment showed resolved corneal oedema with improved pupillary reaction. She was directed for squint surgery but got lost to follow-up. She was referred to the strabismus unit for follow-up intervention, which she did not honour.

Master F.O, a 12-year-old pupil, presented with a 12-h history of trauma to the right globe by a nail. There was anxiety, severe pain, swelling and loss of vision. VA was counting fingers at <3 m. The globe was displaced anterior to the palpebral aperture with both lids tightly retracted, [Figure 1b], and a nail imprint was visible beneath the brow. There was no palpable orbital bony discontinuity, extraocular muscle excursion was full. There was mild corneal epithelial haze and pupil was sluggish.

Parenteral analgesia was given and topical anaesthesia instilled, following which the globe was gently manually reduced. A temporary tarsorrhaphy stitch was applied. Anti-inflammatory, anti-microbial and lubricants were commenced topically. Eyelid oedema resolved and VA improved to 6/24 within 48 h post globe reduction, [Figure 1c]. Patient steadily improved and by 6th day, VA was 6/5, with residual limited subconjunctival haemorrhage, briskly reacting pupil, normal disc and retina findings, [Figure 1d]. At day 14, subconjunctival haemorrhage was completely resolved, as shown in [Figure 1e].

DISCUSSION

Subluxation of the globe is usually an unsettling, infrequent presentation in the emergency department with the

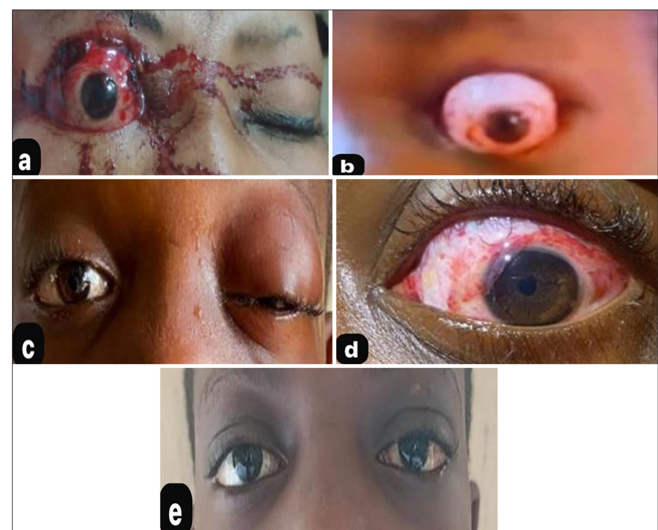

Figure 1: Globe Subluxation. (a) Patient 1 at presentation. (b) Patient 2 at presentation. (c) Patient 2 at 48 hours post globe reduction. (d) Patient 2 at 6th day post globe reduction. (e) Patient 2 at 14th day post globe reduction. (The false impression of proptosis on right eye was due to a slight rotation of the patient).

diagnosis usually clinical, the prolapsed globes being visible, easing diagnosis.[1] High-energy accidents are also antecedent to globe subluxation as demonstrated in the two patients above.[1,10-12] Both patients presented in severe pain, anxiety and poor vision and other features consistent with optic nerve compromise, which resolved rapidly following resolution. Following identification, anxiolytics, analgesics and topical anaesthesia should be promptly administered, following which manual reduction is often relatively possible.[1] Extraocular muscle injury, in addition to optic nerve avulsion, has been described in case of complete luxation of the globe following trauma.[17] One of the patients presented here had an avulsed superior rectus muscle, with a visible residual distal muscle stump, the proximal part having retracted posteriorly, resulting to a residual hypotropia post-reduction. Psychiatric evaluation has been required in unusual cases of globe subluxation following self-gouging.[1,4] Some authors have expressed caution with tarsorrhaphy in non-traumatic cases, noting that the resulting tightness may make reduction of a subsequent subluxation more difficult.[18] Orbital decompression is an option when exophthalmos with subluxation occurs as in severe Graves ophthalmopathy.

CONCLUSION

Subluxation of the globe either following trauma or occurring spontaneously is quite a distressing presentation, evoking patient anxiety and may be unfamiliar to some health care personnel in the emergency department. There is the risk of permanent visual morbidity. However, with prompt identification, reduction and correction of risk factors where present, outcome for globe structure and function can be excellent.

Ethical approval: The research/study was approved by the Institutional Review Board at Federal Medical Centre, Asaba, Nigeria, number NHREC/TR/FMCASABA-HREC/31/7/24/26. dated 11 November 2024.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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