Globe luxation is a rare clinical event. Most of the cases are usually traumatic, although spontaneous globe luxation has also been reported. The majority of the posttraumatic cases are usually associated with the injury or fracture of the bony orbit. We report here a case of globe luxation that occurred \textit{per se} without any injury to the orbital or maxillo-facial bony structures.

**Key words:** Avulsion, globe, luxation, trauma

Complete protrusion of the eyeball from the orbit—a condition called globe avulsion or globe luxation—is a clinical rarity. In fact, it is so rare that an ophthalmologist may encounter such a situation once in his lifetime. It may occur with or without complete or incomplete avulsion of the optic nerve. This may again occur along with disinsertion of one or more extraocular muscles. Visual rehabilitation and restoration of ocular motility depend on the extent of damage sustained by the intraorbital structures.

**Case Report**

A 27-year-old male patient presented to the eye emergency with a history of fall from his bicycle 1 day back following which he complained of severe pain and complete loss of vision of his left eye. On examination, the left globe was found to be displaced anteriorly, and the posterior part of the globe was caught tightly between the closed eyelids [Fig. 1]. Visual acuity was reduced to no perception of light, and the intraocular pressure was moderately raised. The conjunctiva showed profound hyperemia. The cornea showed signs of exposure keratopathy and was edematous at the same time, which perhaps suggested anterior segment ischemia. The pupil was mid-dilated, and the anterior chamber was of normal depth and contour. The central fundus could not be visualized clearly, due to corneal translucency as described. Ocular motility was severely restricted in all positions of gaze. The other eye was clinically unremarkable.

As 1 day had already passed and the patient was in a reasonable amount of distress, the reduction was attempted at the earliest. An O’Brien facial block was first given to reduce the spasm of orbicularis muscle. Regional anesthesia was obtained with a retrobulbar block. Under local infiltration, a lateral canthotomy was done. The upper eyelid was retracted with Desmarre lid retractor and was gradually pulled anteriorly over the luxated eyeball. At the same time, the eyeball was gradually pushed back into the orbit. Exploration of the orbit was attempted to locate the disinserted extraocular muscles, but it was unsuccessful due to a paucity of space and extant tissue edema. The eyelids were then opposed by a temporary median tarsorrhaphy. Lateral canthotomy was repaired by 6/0 absorbable sutures [Fig. 2]. The eyeball was bandaged for the next 24 h. The tarsorrhaphy was left in place for the next 1 week. Postoperatively, he received a single pulse of intravenous methyl prednisolone 1 g OD and intravenous broad spectrum antibiotics for 1 week.

After 1 week, the eyeball was in place, and congestion and pain had reduced considerably. The visual acuity had not improved appreciably, and ocular movements were restricted. Abduction was present in the direction of action of the lateral rectus, but all other primary movements were severely impaired. A computed tomography scan of the brain and the left orbit was requested. It revealed that the bony orbit and the intracranial structures were unaffected and intact. There was, however, clear radiological evidence of optic nerve avulsion of the left eye. The anatomy of the extraocular muscle cone of the same side was distorted as well [Fig. 3]. As recovery in terms of vision and ocular motility was unlikely, the patient was explained of the prognosis.

**Discussion**

Luxation of the eyeball occurs when the equator of the globe is allowed to protrude anterior to the eyelid aperture. The
orbicularis muscle then contracts causing further anterior displacement, and the globe is caught outside the eyelid aperture.\(^1\) It can be of two types—avulsio incompleta—a condition where the optic nerve only is avulsed or avulsio completa—a situation where there is disruption of the extraocular muscles in addition to optic nerve avulsion resulting in luxation of the eyeball. Trauma appears to be the most common cause, which may be accidental or inflicted—as seen in a brutal sport called gouging, where the combatant tries to press the opponent's eyeball out with his thumb.\(^2,3\) Furthermore, reported is a psychological illness called oedipism where the subject is known to voluntarily gouge out his own eye.\(^4\) Nontraumatic or spontaneous globe luxation has been reported in patients with floppy eyelid syndrome and Crouzon's disease, where the etiology is shallowness of the orbital cavity.\(^5\) It has also been attempted voluntarily by men and women alike to create a Guinness World Record for “eye popping.”

Traumatic globe luxation is usually associated with a decelerating injury of significant momentum.\(^6\) The specific cause of injury is varied. Motor vehicle and bicycle accidents are the most common followed by falls. The mechanism of optic nerve avulsion depends on the type of injury. In cases of nonpenetrating trauma, the most likely mechanism is thought to be extreme rotation and forward displacement of the globe causing shearing of the optic nerve fibers. This happens most frequently at the lamina cribrosa, as the loss of myelin and absence of supportive connective tissue septa make the axons particularly susceptible to damage at this location.\(^6,7\)

The extents to which extraocular muscles shall be affected depend on the severity of trauma. The medial rectus is most commonly affected, followed by the inferior rectus, the superior rectus and the obliques in the decreasing order of frequency.\(^8\) Extraocular muscle injury is often associated with severe maxillofacial injuries and single or multiple orbital fractures. Life-threatening neurologic complications such as orbital infection, meningitis, intracranial or subarachnoid hemorrhage, and cerebrospinal fluid leakage have also been reported.\(^7,8\)

Two issues assume importance regarding the surgical management of such cases—first, the issue of successfully repositioning the globe into the orbit and second, to detect and repair the damaged extraocular muscles. Most authorities recommend preservation of the globe to reduce the burden of psychological trauma to the patient. Furthermore, the presence of an intact globe prevents the development of a contracted socket in future.\(^2,4\) Enucleation is, therefore, the last procedure to be resorted when the integrity of the globe

Figure 2: Status on the first postoperative day

Figure 3: Computed tomography scan of orbit both eyes

Figure 4: Status at the end of the first postoperative week

Figure 5: Status at the end of the third postoperative week
cannot be reinstated after all possible efforts. The search and reposition of a lost extraocular muscle is usually difficult and often futile. It should be attempted as early as possible, and any such attempt after a period of 7-10 days inevitably results in failure due to ensuing fibrosis.\cite{8}

Unlike majority of the traumatic globe luxation cases reported in literature,\cite{1,7} he had no injury to the orbital bones or the maxillofacial structures, although nearly all the extraocular muscles except the lateral rectus were disinserted [Figs. 4 and 5]. The optic nerve was avulsed as well, which unfortunately impeded all prospects of visual recovery. Timely intervention, however, saved him from the trauma of enucleation, which at the end of the day would have been the fallout of a simple daily activity like cycling.

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Conflicts of interest
There are no conflicts of interest.

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