

ORBİTA TAVAN KIRIĞI: ANTERİOR KRANİAL FOSSA İÇİNE GLOBE DİSLOKASYONU

ORBITAL ROOF FRACTURE: DISLOCATION OF GLOBE INTO THE ANTERIOR CRANIAL FOSSA

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ABSTRACT

Fractures of the orbit usually involve the floor or the medial wall of the orbit. However, if the roof of the orbit is thin, a blow-out fracture can occur upward into the frontal sinus. Fracture of the orbit's roof accompanying complete dislocation of the globe to the cranial fossa has rarely been recorded. Herein we report on a 58-year-old man referred to our emergency department after falling from a tractor and suffering from a blunt trauma to his face. At presentation, the globe was not seen in the right orbit. CT-scan revealed the fracture of supra-orbital roof with globe dislocation into the anterior cranial fossa. The patient underwent frontal craniotomy and the globe was retrieved by traction through the conjunctival tissue and the fracture was repaired. The globe was repositioned.

Key words: Globe, Orbital Roof Fracture, Trauma.

ÖZET

Orbita duvar kırıkları sıklıkla orbita medial duvarını içerir. Buna karşılık, orbita tavanı ince bir yapıda olursa, blow-out kırıkları frontal sinüsün üst kısmından meydana gelebilir. Orbita tavan kırığı sonucu kranium içine tam göz küresi dislokasyonu nadir görülür. Bu yazıda traktörden düşme nedeniyle acil servisimize getirilen ve künt yüz travması olan 58 yaşındaki erkek hastayı sunduk. Başvuru anında göz küresi sağ orbita içinde görülemedi. Hastanın çekilen tomografisinde anterior kranial fossa içinde disloke olmuş göz küresi ile birlikte supraorbital tavan kırığı saptandı. Hasta operasyona alınarak frontal kraniyotomi yapıldı. Göz küresine konjonktival dokudan traksiyon uygulandı ve kırık onarılarak göz küresi eski yerine getirildi.

Anahtar Sözcükler: Göz Küresi, Orbita Tavan Kırığı, Travma.

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CASE REPORT

A 58 year old man was presented to the emergency center with extensive right-sided blunt head trauma following a fall from a tractor. On examination the right eyeball was absent from the socket. The CT scan revealed a blow-out fracture of the orbital roof and the medial wall with a complete dislocation of the right globe into the anterior cranial fossa. Axial CT scans through the upper part of the face showed the right globe to be intact within the anterior cranial fossa. But as the few cuts of ct-scan didn't reveal the exact position of the globe, an emergent MRI was performed. However the condition of the optic nerve was difficult to ascertain. The orbital rim was intact, but there were fractures of the superior and medial walls of the right orbit. The eyeball was retrieved by gentle traction through the conjunctival sac and the operative exploration showed no impaired integrity of the globe except the continuity of the optic nerve.



Figure 1: The brain CT scan, the globe shadow in the frontal site of the brain



Figure 2: The Brain MRI, the intact lobe in the brain frontal space

The possible mechanism of the optic nerve injury in this case was assumed to be, stretching, rotation and kinking of the nerve fibers causing mechanical damage to the nerve and a possible ischemia due to shearing of vessels and vascular compression. The dislocated globe was repositioned. Postoperative magnetic resonance imaging showed a correct anatomic status. Six months postoperatively the patient's visual acuity was still impaired and no light perception was noted. The patient's eye movement was also restricted.

DISCUSSION

Traumatic dislocation of an intact globe into the cranial fossa after a severe cranio-orbito-facial trauma is a rare occurrence. To the best of our knowledge, only a few cases have been reported in the literature. Time is a major modifiable factor in the management of traumatic globe dislocations. An eye dislocated out of the orbital socket is under serious vascular compromise and sustains severe mechanical damage. Often these patients have associated facial injuries or polytrauma.⁹ Salvaging the eye in this situation is a surgical challenge. Visual prognosis is generally poor in such cases since the retina and optic nerve are very sensitive to the injury and ischemia.⁴ But ocular movements can be restored with an early intervention.⁹ Although recovery of a normal vision has been reported in some cases. Berkowitz had described a patient who retained a normal vision in spite of the fact that this eye that had been subluxated into the maxillary sinus.¹⁰ In a blunt eye trauma, rigid orbital walls and the soft-tissue padding allow for decompression to disperse the forces, sparing the globe, soft tissues and the orbital rim.⁹ The blow-out fracture, usually occurs when an object slightly larger than the orbit itself strikes the ocular region. Here the pressure is transmitted through the globe and substantial soft tissue surrounding the globe and is relieved when the orbital walls fracture. Clinically and experimentally, blow-outs occur most often through the posterior orbital floor just medial to the infraorbital groove.¹¹ Distribution of blow-out location results from a combination of thinness of the bone and its geometric relation to the orbital axis.¹² Smith and Regan demonstrated that the orbital contents were necessary to produce a typical orbital floor blow-out. They suggested that the sudden increase in intraorbital pressure caused the orbital contents to herniated through the weakest part of the orbit.¹³ Although unusual, superior blowout fractures of the orbit do occur, and may be associated with herniation of intraorbital contents into the cranial vault and/or sinuses.¹⁴ Traumatic displacement of the globe is a rare event that results from a severe trauma to the orbit that had most often induced multiple and complex fractures of the orbital rims and walls. This condition can be classified into three categories: luxation, dislocation and avulsion. Dislocation can be defined as the migration of the globe into either the paranasal sinuses or nasal cavities.⁴ According to this classification, in this case the globe was dislocated into the anterior cranial fossa.

The optic nerve has an excess 'reserve' length of 8 mm inside the orbit, which saves it in the event of huge proptosis and globe displacements.⁹ But the orbital vessels are easily ruptured leading

to orbital hemorrhages and secondary increase in tissue pressure. The possible mechanism of the optic nerve injury in this case was assumed to be, stretching, rotation and kinking of the nerve fibers causing mechanical damage to the nerve and a possible ischemia due to shearing of vessels and vascular compression. Being a sensory tract it is not covered by the neurilemma, therefore, there is no regenerative potential when severed and any resulting visual loss will be permanent. As the optic nerve was damaged, the repositioning of the globe didn't restore the vision and the ocular functions.

CONCLUSION

In conclusion; when dealing with the eye injuries in emergency centers there is a natural focus on the associated head and facial trauma, as a result precise orbital scanning is often ignored. When a patient is brought to the ED, with a blunt trauma to the face and the orbital socket is absent from the globe, orbito-nasal CT-scan can support the diagnosis and help to locate the missing globe. This case demonstrated that in addition to the maxillary and ethmoid sinuses, the globe may dislocate into the cranial fossa. Specific requests made for the orbital sequences of CT and paranasal sinuses in the first hours will minimize the need for further scans and avoid undue delays before surgery. Early interventions would help to restore the cosmetic and visual function of the dislocated eye.

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