**Main Article**

Management of orbital floor fractures: Our experience

Dr. Biplab Deb

Abstract

Otolaryngologists are often called to evaluate and manage patients with orbital floor fracture. We have described an overview of the treatment of orbital floor fractures using different reconstructive materials viz. autogenous like bone graft from iliac crest and allogenous like silicon block and titanium mesh. We have found that different implant materials offers equivalent satisfactory results in both functional and aesthetic considerations.

Introduction:

Orbital fractures account for 40% of craniofacial injuries; of the four walls of the orbit, the floor, which is extremely thin, is the most frequently involved. According to pertinent literatures, such fractures represent 67 to 84% of cases of orbital fractures.

Orbital floor fractures can be broadly classified as isolated or complex; the first are isolated orbital floor fractures, and the second are also associated with an orbital rim fracture, involving other skeletal elements: zygomatic, frontal, nasoethmoidal, or maxillary bones.

A blowout fracture mechanism is not very clear; experimental and clinical studies have generally proposed two main theories: the hydraulic and the buckling mechanisms.

According to the buckling theory, the fracture is produced as a result of transmission of the trauma forces directly to the orbital floor through the orbital rim; the hydraulic mechanism considers that the effects of the kinetic energy of the blow are transferred via the incompressible orbital soft tissue to the floor of the orbit.

The most common causes of injury are motor vehicle accidents, assaults, fireworks and falls. The clinical signs and symptoms were periorbital ecchymosis (75% of cases), subconjunctival hemorrhage (92%), periorbital swelling and/or edema (33%), diplopia (60%), altered ocular motility (25%), infraorbital nerve anesthesia (75%), and dystopia (83%) (enophthalmos in 76% and hypoglobus in 24%).

Aims and Objectives:

Management of orbital floor fractures is still debated and controversial. In the literature, there are many conflicting reports about classifications, type of implant materials, and ideal time to perform surgery.

The aim of this study was to report our experience about the repair of the orbital floor fractures using different implant materials.

Study Place: Medical college and hospital, Kolkata

Study Period: September 2013 to October 2014

Materials and Methods:

Between September 2013 and October 2014, we observed 21 unilateral fractures of the orbital floor, pure and impure. Of these patients, only 14 with pure blowout fractures were included in our study. They fulfilled the following inclusion criteria: (1) clinical diagnosis of an orbital floor defect; (2) imaging showing an orbital floor defect. The other 7 patients were excluded because they were affected by impure orbital floor fractures (exclusion criteria) with associated facial fractures. Of these, the zygomatic-malar fracture was the most common. The patients were 11 males (73.33%) and 3 females (26.67%) with a mean age of 48.9 years (range 16 to 56 years).

The most common causes of fracture were sports, vehicle accidents, assaults, fireworks and falls. The clinical signs and symptoms were periorbital ecchymosis (75% of cases), subconjunctival hemorrhage (92%), periorbital swelling and/or edema (33%), diplopia (60%), altered ocular motility (25%), infraorbital nerve anesthesia (75%), and dystopia (83%) (enophthalmos in 76% and hypoglobus in 24%). Three patients had associated extremity fractures, the arm in two cases and shoulder in the third.

All patients were examined by high resolution multislice computed tomography of the floor displacement preoperatively. CT scans were performed with 3-mm thickness contiguous slice section under bone window setting.

The CT soft tissue window allowed us to identify the protrusion of the orbital fat and the entrapment of the extraocular muscles with special regard to the inferior rectus and presence of foreign bodies.

In all the 14 patients, the orbital floor was explored via subciliary approach. The skin incision was placed 2 or 3 mm below lash line, from the medial cantus laterally up to the lateral cantus to reach the orbital floor, avoiding the orbicular muscle and preserving the orbital contain. The
lower maxilla and orbital floor were always dissected free, preserving the periosteum. The reconstruction of the floor is done by iliac crest bone graft in 8 cases, silicon block in 4 cases and titanium mesh in 2 cases.

Summary of Cases Treated from September 2013 to October 2014.

Intraoperatively, all patients received a prophylactic dose of intravenous antibiotics (ceftriaxone 2 g) and, postoperatively, for 3 days.

The clinical follow-up was performed at 1 week, 1 month and 3 months post operative. Diplopia and altered ocular motility was resolved in all patients who had this before surgery.

Enophthalmos resolved postoperatively in all of 4 patients who had these symptoms before surgery. In all 14 patients, the scar was not evident.

Discussion:
The orbit protects the visual apparatus through the bone structures, and it acts as a receptacle. Nevertheless, the slightest trauma can provide serious damage. This is why the integrity of the eye and associated tissues must be evaluated accurately and quickly to avoid irreversible damage. The repair of the orbital floor fractures is not without risks, which must be taken into consideration when surgery is decided as a treatment of choice.

A significant facial asymmetry, imaging evidence of the fracture, the age of the patient, and clinical signs and symptoms are extremely important in determining the surgical indications. In most patients, time allows for disappearance of initial edema and hemorrhage that in some cases are the causes of diplopia and enophthalmos. Fractures of the orbit that do not have functional or aesthetic injuries do not need surgical treatment. In our opinion, the indications for surgery are increased orbital pressure, persisting diplopia, enophthalmos, visual impairment, and hypoanesthesia of the infraorbital nerve. We perform early surgery if there is CT evidence of entrapped muscle or periorbital tissues associated with oculocardiac reflex and also in the presence of symptoms of defects in the orbital structures. In other circumstances, we prefer observing patients for ~7 days because some of deficits can resolve spontaneously 8. In all patients, we use the subciliary surgical approach. We prefer this approach when there is no need to expose the medial or the lateral orbital wall. Furthermore, the scar is not evident. 8

Management of orbital fractures is controversial because of the difficulty in evaluating the anatomy of the defect area, and amount of soft tissue herniation. All patients were imaged preoperatively by high-resolution multislice CT, with coronal and sagittal scans showing the displacement of the floor.

The choice of the material to repair the orbital floor was done considering economic condition of the patients due non supply of allogenic implant materials in govt hospitals.

Conclusion:
we have noticed in our limited period study that different implant materials offers equivlent results in the outcome, though further study is needed to come to any definite conclusion.

References: