Management of Orbital Fractures

Risto Kontio, MD, DDS, PhD[a,*], Christian Lindqvist, MD, DDS, PhD[a,b]

KEYWORDS

• Blow-out • Orbital surgery • Orbital reconstruction
• Fracture of orbit • Resorbable • Bone graft

Trauma to the orbital region can result in considerable facial deformity and can affect vision and the nervous system of the face. Rehabilitation of the patient requires an understanding of the alteration in form and function of the orbit, including the intraorbital and intraocular tissues, and the materials and methods available for repair.

The indications for surgery on orbital floor fractures are controversial. Strong indications include enophthalmos greater than 2 mm, significant hypoglobus, or diplopia. Certain consensus also prevails regarding the need for surgery when there is an increase of orbital volume more than 1 cm^3. When there are lesser degrees of trauma, disagreement remains regarding the best method of treatment.

The timing of surgery for orbital fractures has also been a controversial issue. Orbital fractures differ from all other facial fractures in that surgery does not typically attempt to achieve bone healing. Rather, the goal of surgery is simply to reconstruct the defect area of the fractured wall. As such, delaying the operation for varying periods of time is feasible. Rarely can it be considered an emergency operation.

The material of choice for wall reconstruction has also been under continued debate. There is general agreement that the ideal material for repairing the orbital floor should be rigid enough to support the orbital contents and should restore the original orbital form and volume. It should be safe and user friendly so that even inexperienced surgeons can handle it. It is the responsibility of the surgeon to recognize the diversity of the materials available and to apply them selectively in clinical use.

INDICATIONS FOR ORBITAL FRACTURE SURGERY

Several factors need to be considered in determining whether surgical intervention is indicated in a patient with an orbital fracture. A careful history and thorough physical examination are integral components in making decisions regarding the subsequent management of these patients.

There is general agreement that lack of ocular motility is an important consideration. Motility limitation can be graded on a scale from 0 to 4, where 0 equals no limitation (normal) and 4 equals no movement in the field of gaze. Each limited field of gaze represents a 25% reduction in motility. The most commonly accepted cause for limited motility is entrapment of the extraocular muscles (inferior rectus muscle) or their fascia into a fracture gap in the orbital floor.

Diplopia is another consideration. Although it may be a consequence of muscle entrapment, it can also result from muscle edema, hemorrhage in the orbital cavity, and motor nerve palsy. Another plausible cause is direct injury to the extraocular muscles or nerves. Diplopia correlates better with the severity of orbital injury than with the change of orbital volume.[1] Surgery may increase the risk of diplopia, at least temporarily.

Enophthalmos is another factor to consider and is usually a sign of a large orbital wall defect (**Fig. 1**A, B). Most practitioners define this as greater than 1 cm^3. The underlying cause of enophthalmos is a discrepancy between the volume of the orbital soft tissues and the bony orbital cavity. Enophthalmos greater than 2.0 mm typically indicates the need for surgical

[a] Department of Oral and Maxillofacial Surgery, Helsinki University Hospital, 00029 HUS, Helsinki, Finland
[b] Institute of Dentistry, University of Helsinki, POB 41, FIN-00014, Helsinki, Finland
* Corresponding author.
E-mail address: risto.kontio@hus.fi (R. Kontio).

Oral Maxillofacial Surg Clin N Am 21 (2009) 209–220
doi:10.1016/j.coms.2008.12.012
1042-3699/08/$ – see front matter © 2009 Elsevier Inc. All rights reserved.

oralmaxsurgery.theclinics.com

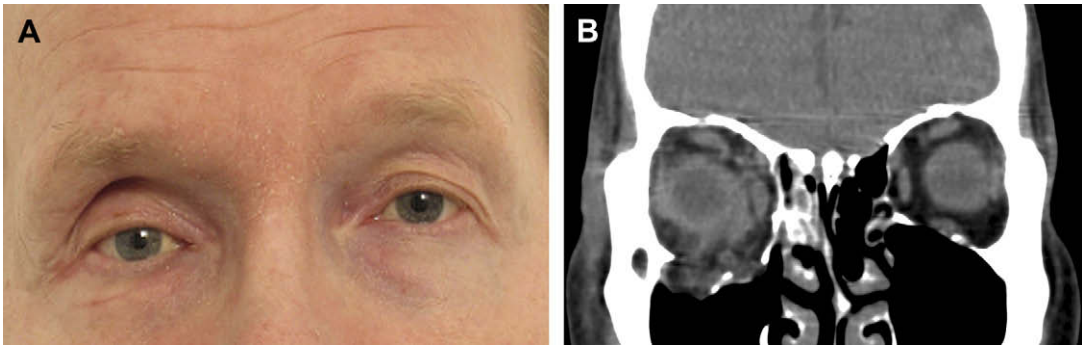

Fig. 1. (*A*) Patient with severe right enophthalmos and hypophthalmos after an injury in a basketball game. (*B*) Coronal CT scan showing the difference in orbital volume between the two sides.

intervention; however, factors such as globe tethering by entrapment, fat necrosis, and posterior soft tissue necrosis also may lead to enophthalmos. Furthermore, an orbital floor defect alone will not necessarily cause enophthalmos if the integrity of the fascial sling supporting the eye is intact.[2] Clinical judgment aided by CT imaging is crucial if operation is considered in patients with enophthalmos. Post injury edema and hemorrhage can cause the false illusion of proptosis and mask a true enophthalmos.

The ability to recognize enophthalmos is crucial for the surgeon. Ahn and coworkers recently published a study related to orbital volume change and late enophthalmos assessed by CT scanning.[3] There seems to be a direct relationship between the increase of orbital volume and measured enophthalmos. In cases with an orbital volume increase of less than 1 mL, the extent of enophthalmos is around 0.9 mm, whereas at a volume of 2.3 mL the enophthalmos is 2 mm. For every 1 mL increase of volume there is approximately a 0.9 mm increase in enophthalmos;[3] however, in normal orbits, there can be a natural volume difference of up to 8% between the left and right sides.[3]

TIMING OF ORBITAL SURGERY

The timing for orbital fracture repair is controversial. Proper surgical timing for an orbital fracture is paramount for producing good results. It has been suggested that there is an increase in complications such as adhesions and fibrosis with late or delayed surgery, which can lead to unsatisfactory outcomes; however, orbital fractures differ from all other facial fractures in that surgery does not typically attempt to achieve bone healing. The goal of surgery is simply to restore the preinjured form of the orbital walls. As such, delaying the operation for varying periods is often recommended. This delay is beneficial in allowing the requisite orbital swelling to resolve, facilitating accurate diagnosis and strengthening the indications for surgery.

Rarely can orbital fracture repair be considered urgent; however, the ideal time to intervene after fracture occurrence cannot be precisely defined. Surgical timing differs in each case depending on the patient's age, fracture type (size, location, displacement, and comminution), functional impairment, esthetic deformities, and other clinical and radiographic findings. These factors should be weighed and individualized in each case. A classification system with treatment algorithms and timing of surgery exists for numerous other forms of maxillofacial trauma but not for orbital trauma.

Koorneef and Zonneveld[4] has suggested a conservative approach to blow-out fractures. In 1983, Hawes and Dortzbach,[5] and later Leitch and coworkers,[6] advocated surgery for orbital floor fractures within 14 and 21 days after trauma. On the other hand, Cole and coworkers[2] have suggested that urgent treatment should be considered in the case of traumatic optic neuropathy. Visual acuity and color desaturation testing must be performed if such an injury is suspected. The use of steroids and decompression has been suggested. Corticosteroids can be used as the only treatment if the visual acuity is better than 20/400.

Another indication for urgent surgery is an orbital fracture combined with an oculocardiac reflex.[7] The symptoms include a vagal tone response with bradycardia, heart block, nausea, vomiting and syncope. The change in vagal tone is presumable related to soft-tissue entrapment. The condition may be fatal; therefore, it should be managed with urgent surgical intervention. Urgent surgery is also indicated for orbital wall fractures in children associated with ocular motility limitations. The soft and flexible bones of children can result in a trap door fracture leading to entrapment of the soft tissues. A defect opens in the

Download English Version:

https://daneshyari.com/en/article/3163363

Download Persian Version:

https://daneshyari.com/article/3163363

Daneshyari.com