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Case Report

Diplopia as an alarm sign in orbital traumatism

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Abstract

Orbital fractures represent between 10% and 25% of all facial fractures. They may be classified into three types: a) orbital rim fractures, b) comminuted fractures of the orbital wall (the most frequently observed), and c) "trap door" fractures of the orbital wall. This pathology is more relevant in traffic accidents due to its greater complexity given the appearance of concomitant injuries. The most frequent clinical signs observed in adults in orbital fractures are periorbital ecchymosis and subconjunctival hemorrhage, although symptoms related to proptosis, feeling of orbital or eyelid pressure, a "crackling" sound with the eyelid pressure or eye movement, numbness of the cheek, nasal wing or ipsilateral forehead, diplopia, pain or nausea in a particular direction of the gaze, and an unexplained desire to keep the eye closed after a trauma. The standardized diagnostic method for the diagnosis of orbital fractures is the computerized axial tomography (CT), being ultrasound and cone beam CT equally useful in some cases. Attending to the treatment, conservative management may be performed, requiring surgery within two weeks if persistent diplopia is found, enophthalmos >2 mm, orbital floor fracture >50%, or associated fractures which requires surgery. Hereby, we realize a short review of orbital fractures a purpose of a case report of 85-year-old man which suffered a left hemifacial traumatism. A CT was performed showing a fracture of the floor of the left orbit (left maxilla) with signs of entrapment of the left inferior rectus muscle.

Keywords: diplopia, orbital fracture, trauma

Introduction

Orbital fractures represent between 10% and 25% of all facial fractures. This pathology is more frequently observed in traffic accidents, being characteristic its greater complexity given the appearance of concomitant injuries at the organic level, zygomatic fractures as well as multiple fractures of the orbital wall [1].

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The most frequent clinical signs observed in adults in orbital fractures are periorbital ecchymosis and subconjunctival hemorrhage, although symptoms related to proptosis, feeling of orbital or eyelid pressure, a "crackling" sound with the eyelid pressure or eye movement, numbness of the cheek, nasal wing or ipsilateral forehead, diplopia, pain or nausea in a particular direction of the gaze, and an unexplained desire to keep the eye closed after a trauma [2].

Hereby, we summarize a brief review of orbital fractures a purpose of a case of patient affected by diplopia after facial trauma.

Case

An 85-year-old man with a history of hypertension, type 2 diabetes mellitus, dyslipidemia, chronic hearing loss, and benign prostatic hyperplasia was admitted in our health center due to falling from his own height in a casual way after stumbling over a curb, suffering a left hemifacial traumatism with slight bleeding from the left nostril. He denied loss of consciousness after the event. Two hours after the concussion, the patient started progressive diplopia and left periorbital pain, which was why he consulted.

On physical examination, there was an abrasion at the level of the left zygomatic region as well as a left palpebral hematoma with crepitus associated. At the neurological level, any disturbs were observed at cranial nerves excepting the third pair, where a possible involvement of the inferior rectus was observed due to a limitation in adduction and left ocular descent.

Given these alterations and the suspicion of a possible periorbital fracture, it was referred to the hospital to complete the radiological study. In this center, a computerized axial tomography (CT) of the face was performed, showing a fracture of the floor of the left orbit (left maxilla), with the displacement of a bone fragment to the ipsilateral maxillary sinus, which also had liquid content in relation to the trauma. In addition, signs of entrapment of the left inferior rectus muscle with pre- and postseptal emphysema and edema of the left palpebral soft tissue were observed (Figure 1).

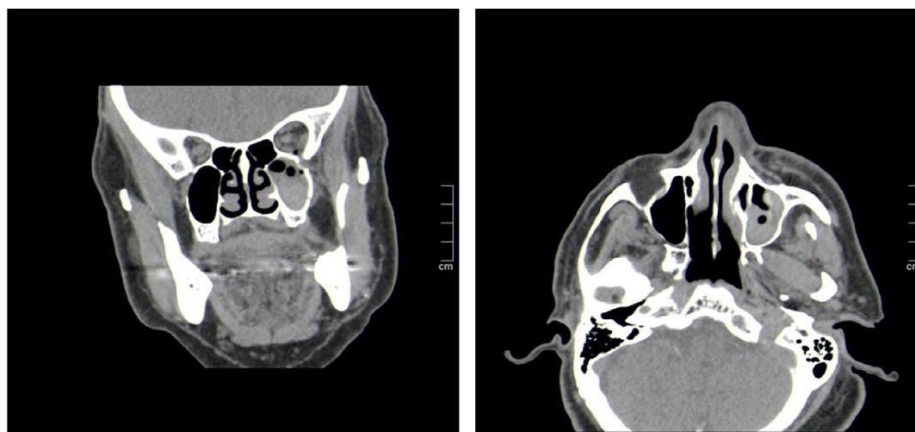


Figure 1. Computerized axial tomography (CT) image showing a fracture of the floor of the left orbit (left maxilla), with the displacement of a bone fragment to the ipsilateral maxillary sinus with associated fluid content. Signs of entrapment of the left inferior rectus muscle with pre- and postseptal emphysema and edema of the left palpebral soft tissue are also observed

Given these findings, the case was discussed with the maxillofacial surgery department indicating the initiation of antibiotic therapy (Amoxicillin/Clavulanic), non-steroidal anti-inflammatory drugs, and corticosteroid therapy as conservative management. At present, after three months of the event, alternate diplopia persists, which is why ambulatory control is followed.

Discussion

Orbital fractures, which represent between 10% and 25% of all facial fractures, may be classified into three types: a) orbital rim fractures, b) comminuted fractures of the orbital wall, and c) "trap door" fractures of the orbital wall [1,3]. The first one is characterized by the involvement of two or more bony localizations, being those caused in the same orbital rim as a consequence of the bone displacement of one of them affecting the other. This type may involve more than two walls, being the fractures of Le Fort II and III an example of this [3]. Fractures in "trap door" are frequently observed in childhood due to their bone elasticity, and are characterized by the absence of displacement. The mechanism is based on a temporal pressure increase that causes a linear orbital fracture with a bone displacement that automatically returns to its original position. Likewise, they are characterized by the scarcity or absence of ecchymosis and conjunctival hyperemia [3]. Finally, the most frequent fractures are the comminuted fractures of the orbital wall, which are characterized by being isolated and associating the displacement of small fragments, as in our case. The classic form consists of an increase in eye

pressure and soft tissue transmitted to the orbit causing a fracture to the outside of the wall. They may also be inward, although they are less frequent [4].

Between 11% and 15% of orbital fractures represent an ophthalmological emergency, which is frequently related to a decrease in visual acuity or other visual disturbs. Nevertheless, it should be noted that this is not pathognomonic given that close to 100% of orbital trauma (with or without associated fracture) is associated with alterations in visual acuity [5]. Another frequent symptomatology observed in orbital fractures is periorbital ecchymosis and subconjunctival hemorrhage, although it can also present with proptosis, sensation of orbital or eyelid pressure, a "crackling" sound with pressure of the eyelid or eye movement, numbness of the cheek, nasal wing or ipsilateral forehead, diplopia, pain or nausea in a particular direction of the gaze, and an inexplicable desire to keep one eye closed after a trauma. Diplopia is usually related to fractures of the floor of the orbit and trapping of the inferior rectus [2], although there are series of cases (up to 80%) that observe that this visual alteration does not imply entrapment of an extraocular muscle, but rather which may be a consequence of orbital edema. This may be due to transient paralysis of the inferior rectus secondary to trauma as a consequence of local edema and contusion [6]. Apart from diplopia, restriction in ocular motility, nausea, vomiting, and bradycardia secondary to the oculocardiac reflex may give the suspicion of entrapment of the inferior rectus [7].

The standardized diagnostic method for the diagnosis of orbital fractures is CT, which adds more prognostic and diagnostic information since they are usually observed in polytraumatized patients. Nevertheless, some authors suggest that in cases of suspected fracture secondary to low energy mechanisms, ultrasound and cone beam CT may be equally useful, especially in fractures of the orbital floor [8]. Attending to the treatment, conservative management may be performed, requiring surgery within two weeks if persistent diplopia is found, enophthalmos >2 mm, malposition of the eyeball, orbital floor fracture >50%, or associated fractures which requires surgery [7].

In conclusion, orbital fractures are a frequent entity within facial fractures. They are usually produced by high energy mechanisms, although sometimes not, causing little disturbs in the physical examination and thus reducing the diagnostic suspicion. Due to that, an adequate neuro-ophthalmological exploration is especially relevant to rule out serious injuries, including the entrapment of oculomotor muscles such as the lower rectus.

Conflict of interest

All authors declare that they have no conflict of interest.

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