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Hypoesthesia Of The Infraobital Nerve As The Only Symptom Of A Blowout Orbital Fracture: Report Of A Case And Review Of The Literature

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Abstract

Orbital blowout fracture may occur after blunt trauma to the face and scull and may present with various symptoms, while hypaesthesia of infraorbital nerve indicates a late diagnosis. We present a case of a 12–year–old child who was referred to the otolaryngology outpatient clinic, complaining of numbness in the region of the right zygoma affecting lower lid, cheek, nose and the upper lip. Except from a difference in sensitivity in the infraorbital region, ENT and ophthalmologic examination were normal. Detailed history, revealed a history of blunt trauma caused by a tennis ball to the region of the right orbit one month ago. A high resolution CT scan confirmed the diagnosis of a blowout fracture. The diagnosis of blowout fracture can occasionally be missed on clinical examination. We highlight the importance of detailed history together with high index of suspicion, especially regarding the exact mechanism and impact of injury.

INTRODUCTION

Orbital blowout fracture has been recognized as a clinical entity since the first case reported by Lang in 1889. [1] Orbital fracture may occur in any patient who has blunt trauma to the face and scull. The main etiology of trauma in all age groups is alcohol related assault, sport injuries, traffic accidents and others, such as falls, head to eye collisions and domestic accidents. Motor vehicle accidents are the rising etiology of modern time. In children, more often compared to adults, it is found trapdoor fractures because of the softer and more flexible orbital bones. Entrapment of tissue, like fat, connective tissue and muscle, is more likely to happen, so the physician must be alert and more careful. Trapdoor fractures occur when a circular segment of the bony orbit fractures and becomes displaced but remains attached to one side. Entrapment of the soft tissue and muscle may not only limit eye movements, but may also result in early tissue necrosis caused by impaired blood supply caused by compression of the tissue within the contents of the fractured bony orbit.[2]

A case of late diagnosed blowout fracture of the orbit in a 12-year-old boy, presenting only with hypoesthesia of the infraobital nerve is reported. Clinical findings, diagnosis and management of blowout fractures are discussed.

CASE REPORT

A 12-year-old boy was referred to our outpatient department. The child was complaining of numbness and altered sensation in the region of the right zygoma, affecting the lower lid, the cheek, the nose and the upper lip for the previous 15 days. During the first consultation, he did not associate his symptom with any history of traumatic episode or infection. Complete clinical ENT examination, including endoscopy, was normal, except from a difference in sensitivity in the infraorbital region. Ophthalmologic examination showed a Best Corrected Visual Acuity (BCVA) of 10/10 bilaterally. The anterior segment examination was unremarkable in both eyes. Intraocular pressures were normal. Relative Afferent Pupillary Defect (RAPD) was absent in both pupils. The posterior segment examination under dilation was unremarkable. Ocular motility was full in both eyes.

More detailed questioning, revealed a history of a blunt trauma in the region of the right orbit, caused by a tennis ball one month prior to admission. He had not any acute symptoms and he did not seek any medical help. A plain occipitomental x-ray of the sinuses which was performed before three weeks revealed opacity of the right maxillary antrum and oral antibiotics were prescribed by a General

Practitioner. A new occipitomental x-ray was reported as normal. Next day coronal CT scan of the facial scull was performed, and revealed a right orbital floor fracture. (figure. 1)

The patient was hospitalized for two days and was prescribed oral steroids, prophylactic antibiotics and also topical nasal decongestants for seven days. During his follow-up appointments the patient remains symptoms free.

Figure 1

Figure 1: Coronal CT scan of the orbit which shows a blowout fracture in the region of infraorbital nerve.

DISCUSSION

Blowout fractures are divided into pure and impure. The term pure orbital blowout fracture is used to describe a fracture of the orbital floor, the medial orbital floor or both, with an intact bony orbital margin. The term impure orbital blowout fracture is used when such fractures occur in combination with a fracture of the orbital rim. The most common site for a blowout fracture to occur is the posteromedial aspect of the orbital floor, medial to the infraorbital neurovascular bundle where the maxillary bone is very thin. [3] Lamina papyracea is also thin and the medial orbital wall is also prone to fracture. Although the lamina papyracea is thinner than the maxilla, the existence of ethmoid air cells reinforce the medial wall like corrugated paper or a beehive. The orbital floor overlies the maxillary sinus without reinforcement, therefore is weaker and more blowouts tend to occur here especially in the posteromedial floor (near the infraorbital groove), where it is the weakest area. [4]

Two theories are proposed for the mechanism of the blowout fracture: a) the buckling theory by Le Fort. He concluded that blowout fractures were produced by transmission of the force by bone conduction through the orbital rim to the floor. b) The Hydraulic theory and mechanism, suggesting that force is transmitted to the orbital walls by an impact to the globe. This force was resisted by thick lateral orbital wall and directed downwards onto the thin bone of the floor and medial wall resulting in a fracture with or without herniation of orbital contents into the maxillary or ethmoid sinuses. [5]

Patient's clinical signs are depended on the timing of the examination in relation to the traumatic episode. An examination just after the episode could reveal eyelid ecchymosis and haematoma (although they may be absent in the “white eyed blowout fracture”), infraorbital emphysema, eyelid swelling after nose blowing. There can also be a limitation of ocular motility but does not prove that a fracture has occurred. (the commonest complication is limitation in up-gaze). Enophthalmos can be the only physical sign regarding a patient presenting months after the traumatic episode .It can vary from insignificant to cosmetically disfiguring. Hypaesthesia in the distribution of the infraorbital nerve is almost pathognomonic and includes altered sensation in the cheek, upper teeth, zygoma, affecting the lower lid, the nose and the upper lip. Hypaesthesia occurs when the fracture extends along the infraorbital groove or canal injuring the infraorbital nerve. [3] Patients with pure blowout fractures not involving the orbital rim or adjacent facial bones are usually free of ocular abnormalities after the traumatic episode. [6]

Initial clinical evaluation must include history, and full ophthalmic examination with measurement of visual acuity, enophthalmos, diplopia, ocular alignment and ductions. Forced duction testing must be performed when it's allowed by patient's cooperation. There is also an association between nausea and vomiting and trapdoor fractures. Nausea and vomiting may be a vagally mediated response to pain or other sensory feedback associated with extraoccular muscle tension, and must alert for a possible trapdoor fracture especially in presence of restricted extra ocular motility. Plain radiographs are not diagnostic, because of the high number of false negatives and non diagnostic results. [7] Also, the classic “tear-drop” sign is unreliable.[8] Ultra Sound imaging might also be useful for assessing orbital floor fractures, but its sensitivity is only 85%. [9]

Direct coronal CT is widely accepted and useful method of identifying orbital fractures and possible extra ocular muscle or soft tissue entrapment [8] while others advise high-resolution axial CT of the orbits. [10] CT has even been used to predict future enophthalmos in some patients. [11] An increase in orbital volume of more than 13% can result in enophthalmos. [12] MRI also should be employed in blowout fractures cases in addition to CT, because it gives a much more detailed picture of the soft tissue. Even small herniations of the orbit contents can be detected, they can clearly be differentiated and any necessary directional slies can be taken so running images of the incarcerated muscle belly can be revealed. [13] What is indicated is a thorough history, physical examination and complete ophthalmic evaluation with consideration with diagnostic studies on a case by case basis.

The management of orbital blowout fractures is controversial. The physician's philosophy along with physical examination and radiology findings will direct the management. Many orbital blowout fractures have no sequelae if they are untreated, but others may result in serious complications. We must emphasize that from the clinical findings, presence of diplopia and enophthalmos will direct to surgical decision, while infraorbital emphysema and hypoesthesia in the V2 distribution are examples where physicians may differ in opinion. In general the indications for the surgical repair of a blowout fracture are: muscle entrapment with ocular motility restriction and diplopia, early enophthalmos greater than 2mm, and orbital defects in more than 50% of the floor or medial wall.[2] Patients with diplopia should be observed for a period of up to two weeks. If the diplopia resolves and the fracture is small, no surgical intervention is required, but young patients with tissue entrapment and a trapdoor fracture on CT, are at risk of developing an ischaemic contracture (this is an indication for an early surgery within 2 days).[2]

The most common surgical approaches in a cross-sectional study by Courtney et al were the subciliary (41%), the infraorbital (37%), the transconjunctival (7%) and the mid lower eyelid approach (3%), while one surgeon preferred the Caldwell-Luc approach. [14] Radiological findings and especially CT scans must be performed before any decision for surgery is taken.

In conclusion we believe that even blowout fracture is common, it is easy to miss, while there are still controversies regarding indications, timing and type of surgical intervention. We believe that detailed history together with high index of suspicion, especially regarding the exact mechanism and impact of injury, can increase the possibility of blowout fracture diagnosis.

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