DOUBLE VISION: A SYMPTOM OF AN OVERLOOKED ORBITAL WALL FRACTURE.

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ABSTRACT

Double vision or diplopia following trauma is almost always related to orbital wall fracture particularly orbital floor fracture. Albeit other possibilities leading to diplopia including, orbital haemorrhage, muscular oedema or haemorrhage, cranial nerve palsy or entrapment of muscle or soft tissue, orbital floor fracture ought to be ruled out primarily. Orbital floor fracture should be suspected more so when diplopia is accompanied with enophthalmos and hypoglobus. Clinical examination and radiographic examination are normally sufficient in diagnosing this entity. Herein, we report an overlooked orbital floor fracture and its management in a young girl who presented to the emergency department post trauma complaining of multiple facial laceration with double vision.

Keywords: Diplopia, enopthalmos, orbital fractures, traffic accidents.

INTRODUCTION

Orbital floor fracture a common traumatic lesion of the craniofacial complex, is often missed by the attending physicians especially when it's accompanied by other facial trauma. Presence of diplopia or double vision following trauma should raise suspicion towards orbital floor fracture as imaging is usually carried out immediately to confirm this entity. Herein, we are reporting a case of a missed orbital floor fracture with a positive radiographic finding which at the time of initial presentation was not detected by the attending Accident and Emergency Department physician. Timely diagnosis and prompt treatment will prevent unnecessary morbidities and possibility of future costly medical litigation. We recommend referral of all cases with diplopia following facio-orbital trauma suspected of orbital floor fracture for Oculoplastic consultation at the Ophthalmology Department.

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CASE REPORT

A 22-year-old medical student with past medical history of bronchial asthma was brought to Accident and Emergency Department, Hospital Universiti Sains Malaysia, Kelantan following motor-vehicle-accident whereby she was a back seat passenger in the car. Patient did not wear her seat-belt and she was thrown forward when the car she was in col-

lided with the back of the car in front. Her face hit the car seat in front causing her spectacles to break. She admitted that there was no loss of consciousness, no nausea or vomiting. There was also no blurring of vision, floaters or foreign body sensation over both her eyes. Primary survey was noted to be clear. During secondary survey, multiple superficial laceration wound were noted over the face which was sutured under local anesthesia. Patient was placed in the observation ward during which she complained of double vision on the right eye especially upon upward gaze. She was informed by the attending doctor that her facial radiograph done was normal and she was eventually discharged home.

The symptoms of right diplopia persisted and she had difficulty reading and concentrating during lessons. According to the patient, 1 week after the accident she was referred to the ophthalmology department for her diplopia. A computer tomography (CT) scan of the orbit was ordered and she was given a one-month appointment. Patient also was referred to the Plastic and Reconstructive Surgery clinic for follow up of her tender facial wounds from the accident.

Upon inspection at the Plastic and Reconstructive Surgery clinic, well-healed scars were noted over the right eyebrow and right lower lid. Right-sided enophtalmos was also noted. There was no restriction in the ocular movement however according to patient, diplopia was noted upon upward gaze. Upon palpation, there was no step deformity or crepitation over the right inferior orbital wall. Upon reviewing the initial radiograph of skull following her trauma, the 30 degree occipito-mento view radiograph done revealed comminuted fracture of the right inferior orbital wall (Figure 1). CT scan which was ordered by the Ophthalmology team 1 week after the accident demonstrated comminuted fracture of right inferior orbital wall (Figure 2).

Figure 1: 30 degree occipito-mento view radiograph displaying comminuted fracture (black arrow) of the right infe-

Patient subsequently underwent right inferior orbital wall exploration and reconstruction with calvaria bone graft. Intraoperatively, sub ciliary approach was used to access the inferior orbital wall. The defect of the fracture site was 3.0 x 1.0 cm which was 1.5cm away from the inferior orbital rim. Autologous calvaria bone graft was harvested from the patient at the same setting and used to reconstruct the fractured inferior orbital floor (Figure 3). Post-operatively, patient was well and there was no further diplopia at 2 weeks after surgery. Upon her follow-up, patient had no complaints of diplopia, blurring of vision or any other complaints till date.

DISCUSSION

Amongst different types of facial fracture, orbital fracture comprises of 10-20% of cases.[1]

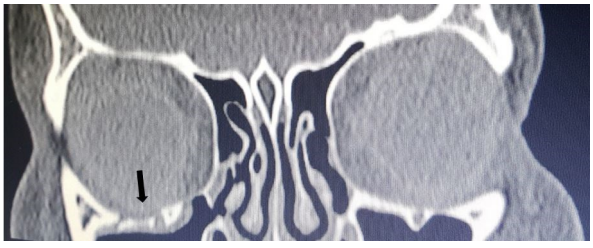

Figure 2: CT orbit performed 1 week after the accident showing comminuted fracture (black arrow) of right inferior orbital wall. (Click to enlarge)

Figure 3: Calvaria bone graft harvested at the same setting to reconstruct the fracture site.

Orbital floor fracture is known to be the most common fracture site of the orbital fracture due to the lack of central support.[3] In about 50% of cases, orbital floor fracture is accompanied by medial wall fracture. Soft tissue including muscle and fat entrapment usually accompanies orbital floor fracture. In our patient, there was no entrapment noted.

Two main theories has been postulated on the mechanism of orbital floor fracture.[4] Of the most plausible theory is the 'hydraulic theory' whereby a blow to the orbital rim will create pressure gradient which will be transmitted to the weakest part leading to disintegration of the part of the bone. The second theory is the 'buckling theory' which claims that the increase pressure following trauma causes compression of the inferior orbital rim and subsequently buckling of the floor.

Ideally, complete history taking of all patients' with facial trauma should include mechanism of injury. Blow-out fracture is suspected with a history of eye being struck by an object larger than diameter of orbital rim.[5] Patient with orbital fractures have clinical presentation which varies according to presence of ocular trauma and its location. Common presenting symptoms include pain with motility, diplopia with limitation of motion, hypaesthesia and trismus. As for the signs, it includes ecchymosis, crepitus, bone step-off, ptosis, enopthalmos and strabismus. Occasionally, infraorbital nerve injury may lead to hypesthesia, dysesthesia or hyperalgesia.[5] Presence of diplopia in our patient may have been overlooked by the attending physician as double vision post trauma may also be due to muscular edema or haemorrhage which resolves spontaneously and also as the patient was not wearing her glasses.

Ideally a CT scan with an axial and coronal view and thin cuts (2-3mm) is the gold standard in diagnosing facial skeletal fracture, particularly orbital floor fracture, since such fracture can be missed by the undiscerning eye if only the usual 30 degree occipito-mento view radiograph is taken, as shown by our case.[5] CT scan enables the determination of size and type of fracture, which aids in diagnosing and surgical planning for the patient. Plain radiography is useful in diagnosing facial fracture especially when urgent computer tomography CT scan is not indicated or available in the Accident and Emergency Department. The occipito-mental view radiograph done for our patient demonstrated comminuted fracture of the inferior orbital floor but was missed by the attending Accident and Emergency Department physician.

There are three general guidelines for surgical intervention, which includes: presence of diplopia with a positive forced duction test and positive radiological imaging, presence of enophthalmos greater than 2mm two weeks post trauma and lastly, fracture involving one half or more of the orbital floor causing cosmetic and functional deformity.[6] However, management ought to be tailored based on patient's symptoms and condition.

Surgical intervention is best done two weeks following trauma as more accurate visual examination can be carried out and during this period facial oedema would have subsid-

ed. Delay in surgery especially with a missed or overlooked orbital floor fracture leads to fibrosis, scarring, contracture and unsatisfactory union. Surgical intervention has its fair share of complications including persistent diplopia, loss of vision, traumatic optic neuropathy, over-correction or under correction of enopthalmos, lower eyelid retraction, extrusion of the orbital implant, infraorbital nerve damage, orbital congestion and infection. Complete eye examination is required post-operatively to assess patient's vision. Our patient successfully underwent orbital floor exploration and reconstruction with autologous calvaria bone graft which has resolved her diplopia.

CONCLUSION

Despite the pathognomic findings exhibited by our patient which highly suggest orbital floor fracture, yet it was overlooked by the attending physician and the radiograph done was also overlooked. This case report emphasizes the importance of awareness and high clinical suspicion amongst attending physicians especially the Accident and Emergency Department physician in diagnosing this entity. We would like to recommend that all cases with double vision post trauma are referred to the Ophthalmology department for evaluation and further management.

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