

## Management of isolated lateral orbital wall blow-in fracture with optic nerve compression - Time is vision

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### ABSTRACT

Blow-in fracture of orbit usually involves floor and medial wall. The lateral wall of an orbit is the strongest wall to prevent blow in. Blow-in fracture of an orbit with severe proptosis and fracture segment pressing on an optic nerve causing impending loss of vision is a very rare entity. Early diagnosis and immediate treatment are very important for restoration of vision in such patient. Here, we report the case of a post-traumatic lateral orbital wall blow-in fracture in a 22-year-old male. The fracture was compressing the optic nerve, which can cause severe proptosis and may even lead to vision loss if not treated early.

**Key words:** *Blow-in fracture, Lateral orbital wall, Proptosis, Vision loss*

A blow-in fracture is an inwardly displaced fracture of the orbital rim or wall resulting in decreased orbital volume [1]. Clinical features of blow-in fractures were primarily related to the decrease in volume of the orbital cavity. Proptosis, restricted ocular motility, and diplopia are present in the patient with blow-in fracture. Globe rupture, superior orbital fissure syndrome, and optic nerve injury can be present in some cases [2]. Blow-in orbital injuries were classified as pure fractures, consisting of an isolated blow in of a segment of the roof, floor, or walls, or impure fractures, where the orbital rim itself was disrupted [3]. In some cases, early decompression of the orbit and open reduction of fractures were necessary [4].

The purpose of this case report is to discuss clinical features, radiological findings, and the management of the patient with lateral blow-in fracture with acute vision loss.

### CASE REPORT

A 22-year-old male reported to the department with a chief complaint of sustained injury over the face due to an accident from a high-speed motor vehicle in the morning. The patient had given a history of fall from bike and collision of face over an electric pole. He had sustained lacerated wound over the left cheek region which was sutured in the primary health center immediately after the accident. Later on, the patient came to the hospital and presented with loss of vision and severe pain in the left eye for 1 h.

On clinical examination, the patient was conscious and oriented to time, place, and person. His vitals on admission were pulse 88/minute, blood pressure 110/70 mmHg, respiratory rate 26/min, and saturation 99%. His Glasgow Coma Scale on

admission was 15/15. On ophthalmic examination, the patient had a severe proptosis with restriction of ocular movement (Fig. 1). His papillary reaction to light was sluggish on the left side and the left pupil was semi-dilated. However, there was no hypoesthesia over the left infraorbital region. The patient had the only perception of light in his left eye.

Immediate computed tomography (CT) scan of orbital region done was suggestive of impure blow-in fracture of the left lateral orbital wall with medial displacement of an inner wall of the greater sphenoid wing (Fig. 2). Fracture segment was very close to the left optic nerve. The decision of immediate exploration was taken.

Exploration of fracture was done through preexisting laceration under general anesthesia. Open reduction of an impinged lateral orbital wall fracture was done. Afterward, internal fixation was performed with titanium plate and screw (Fig. 3a and b). The laceration was closed in layers, an occlusive dressing was given, and the patient was shifted to the recovery room after extubation. Post-operative recovery was uneventful. The patient had visual perception up to one foot after 24 h of operation which was improved over 1 week. There were no diplopia and proptosis and no restriction of movement in the post-operative period. The follow-up of the patient was done for a period of 3 months (Fig. 4). After 3 months, the patient was having visual acuity 6/6 in the left eye, and there was no diplopia or restriction of an ocular movement.

### DISCUSSION

A blow-in fracture is an inwardly displaced fracture of the orbital rim or wall resulting in decreased orbital volume. This type of



Figure 1: Pre-operative photograph showing marked proptosis



Figure 2: Axial computed tomography images showing compression of optic nerve

fracture is much less common than the often encountered orbital floor “blow-out” fracture [1]. This type of greater sphenoid wing fracture is caused by buckling of the orbital wall secondary to severe compression of the orbital rim. Orbital “blow-in” fractures were first described in 1964 by Dingman and Natvig (2). Orbital floor fractures can be described as “pure” or “impure” on the basis of the coexistent presence or absence of an orbital rim fracture [2,3].

This presentation can be even more concerning than a blow-out fracture because it causes a decrease in orbital volume. This can lead to compression of orbital contents and subsequent ischemia or globe rupture from fracture fragments [5]. Orbital blow-in fracture resulted in a decrease in orbital volume which may result in proptosis. Fracture fragment may displace in an orbital cavity which may result into globe rupture. Optic nerve injury is a very rare finding in orbital blow-in fracture [6]. Decreasing vision, proptosis, and a superior globe displacement resulting in dystopia on the injured side should point to the blow-in fracture and emergent ophthalmologic examination for possible vision salvaging reduction [7]. Radiological findings in conjunction with decreasing vision require immediate surgical intervention [7,8].

The management of the lateral orbital wall fracture depends on the degree of displacement and comminution of the fracture,

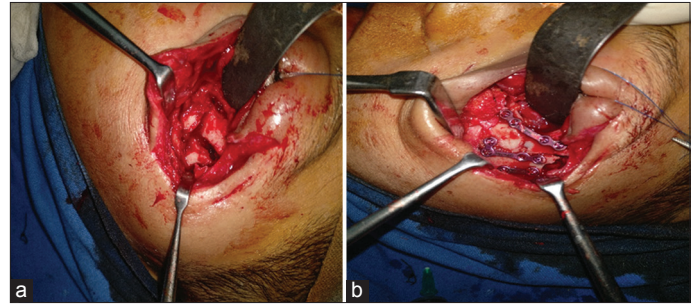


Figure 3: (a) Impacted lateral orbital wall, (b) reduction of fracture fragment and fixation



Figure 4: Post-operative picture of patient after 3 months

intracranial extension of sphenoid fracture [9]. A non-displaced or mildly displaced fracture may be managed conservatively without surgical repair. If the displaced lateral wall fracture causes visual loss, ocular motility disturbance, enophthalmos, or flattening of the malar eminence, fracture repair is indicated as described by Unger *et al.* [10]. BC Patel stated that goal of therapy is to anatomically reduce fracture segments and to restore a normal orbital volume [11]. Reconstitution of a normal orbital volume and support for the globe will prevent post-injury enophthalmos and globe malposition.

## CONCLUSION

Lateral orbital blow-in fracture is a rare but serious condition which may result in loss of vision if untreated early. Early diagnosis and prompt treatment of lateral blow-in fracture are very important to prevent loss of vision. Proptosis and decreased vision in blow-in fracture are suggestive of loss of orbital volume and injury to the optic nerve, and CT orbit/face is a very useful diagnostic tool to assess such condition. Hence, timely surgical exploration and decompression of optic nerve can save patient's vision.

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