

Blow-Out Fracture of Orbit (Reconstructed with Stent Campo)

P.A. Lamba, A.K. Gupta & K.N. Shukla

Department of Ophthalmology

Jawaharlal Institute of Post-graduate Medical Education & Research, Pondicherry (India)

THE fractures of orbit and the surrounding region of skull are common.

The classical causes have been fall from a height or a crushing blow but in an age of impatiently accelerating travel, high speed crashes and collisions account for an ever increasing number of such accidents. In such injuries, the damage to the bones may be extensive, but trauma elsewhere may be so severe that the local condition may have to be neglected temporarily in the interest of saving the patient's life.

The term blow-out fracture of the orbit refers to a specific syndrome in which fracture of the orbital walls (usually floor and medial wall) occur without involving the stout orbital rim (Converse, 1962). In a typical case the causal injury is comparatively slight—a blow by a cricket or tennis ball etc. or by a closed fist. This causes an increase in the intra-orbital hydraulic pressure, which is transmitted to the walls of the orbit, the more delicate portions being fractured and 'blown outwards' (Pfeiffer 1943 & Smith and Converse, 1960). Experimental evidence in support of this theory has been produced by Smith & Regan(1957) in experiments on cadaver. Pfeiffer (1943) recorded an incidence of blow-out fractures as 20 percent of a series of fractures involving face and skull.

Aim of the present paper is to discuss an interesting case of orbital blow-out injury with prolapse of globe into maxillary antrum. The floor of orbit was repaired by using alloplastic material (Stent Campo) with satisfactory result. The patient has been followed up for 5 months.

Case Report

A 35 years old labourer was brought to JIPMER Hospital in October, 1969, with multiple injuries on the face. Interrogation revealed that he sustained the said injuries while excavating a well, when parapet wall collapsed and fell over his scalp and face from a height of 4 yards.

General examination revealed that the patient was fully conscious. The cardiovascular, respiratory and central nervous systems were found normal. Local examination showed incised wounds on the face (shown by interrupted lines Fig. 1) which were full of mud. The nasal bones were fractured with a wound extending from the base to the tip of nose.

Ocular examination : Left Eye :

The skin of the left side of forehead and left temporal region was seen avulsed for about 4"—6" depth and the underlying frontal bone was clean. Both upper and lower lids were also avulsed from the orbi-

tal margins except for a pedicle near the temporal ends. The orbit was full of mud. The periosteum of the orbital roof was seen to be stripped off and the bone was clearly seen. Some tissues were seen in the orbital cavity which were pushed towards the floor and no components of the globe could be made out by inspection.

X-ray examination of skull and PNS showed no evidence of bony fracture. However a radioopaque shadow was seen in

showed punctate haemorrhages. There was no rupture of scleral coat.

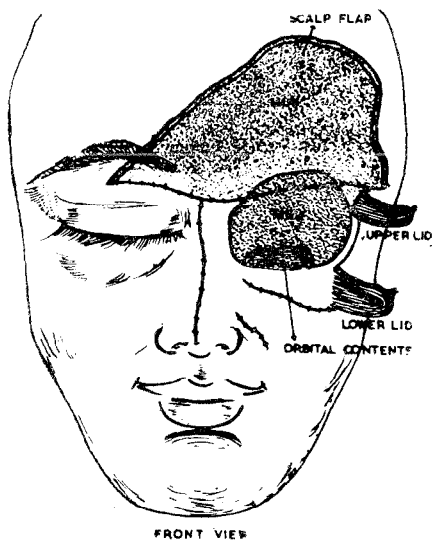


Fig. 1—Showing the injuries sustained by the patient-Front view (diagrammatic)

upper part of orbit due to collection of mud (Fig. 2).

Under general anaesthesia, the wound was cleaned and the sand particles were washed out. On palpation—the globe could be felt near the medial part of the floor as a small cystic swelling and had herniated into the maxillary antrum after fracture of the floor of orbit (Fig. 3). The globe was pulled out gently. Cornea and AC were found normal. Pupil was small. Iris surface

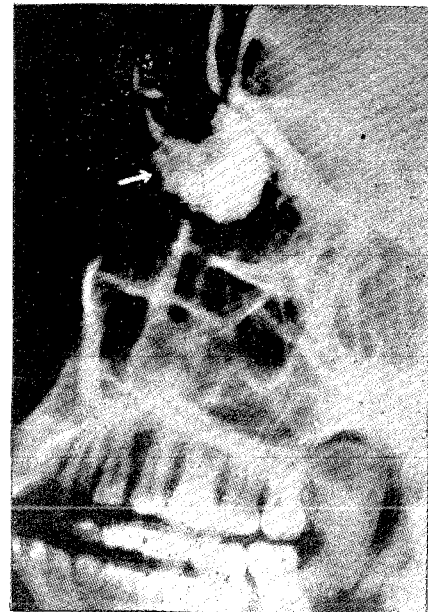


Fig. 2—Arrow points to the radioopaque shadow in the orbit cast by the mud particles.

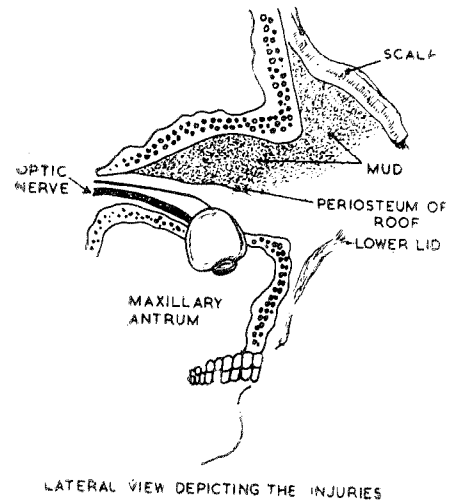


Fig. 3—Shows the fracture of floor of orbit with the globe herniating into maxillary antrum.

Right eye was normal and showed no evidence of trauma.

Repair of Orbital floor :

The floor of the orbit was palpated to deter-

mine the extent of fracture. The globe was replaced in position after anchoring the periosteum and the conjunctiva. A thin plate of Stent campo (10×20 mm) was prepared to repair the floor of orbit and was placed between the bone and periosteum. The periosteum of the floor was sutured to the inferior orbital margin. The skin wound was sutured and the lower and upper lids were reformed. Tarsorrhaphy was done. The eye dressed with pressure bandage. Postoperative recovery was uneventful without any infection.

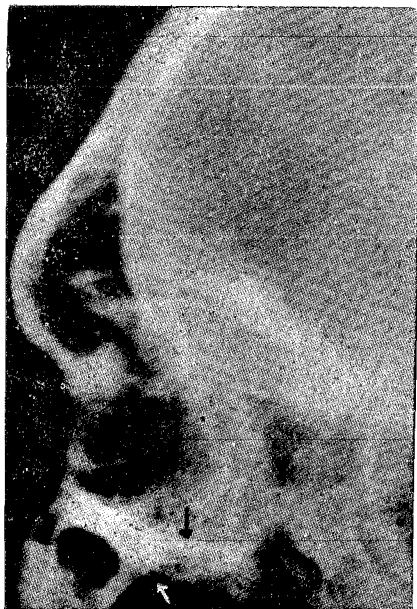


Fig. 4—Lateral view of the floor of Orbit (X-ray) white arrow points to the fractured ramments of orbital floor. Black arrow points to the shadow cast by the plate of Stent Campo.

7th Postoperative day : The left eye did not show any undue reaction except for mild chemosis. Ptosis on left side was due to tearing away of LPS muscle fibres. The globe was immobile. The eye had a visual acuity of 6/18 P. Ophthalmoscopy revealed

a normal fundus. X-ray of paranasal sinuses showed that the left maxillary antrum was hazy. A radioopaque shadow was seen above the floor of the orbit cast by the plate of dental compound used for reparative purposes. (Fig. 4).

10 months later, the upper lid was still drooping. The eye was enophthalmic with slight limitation of movements. The fornical conjunctiva showed mild congestion without any pain or tenderness. The acuity of vision was same as before and optic disc showed no change in colour. There was anaesthesia along the distribution of infra-orbital nerve. (Fig. 5).



Fig. 5—Appearance of the patient's eye 10 months post-operatively-

Comments

A minor fracture or crack in the floor of the orbit poses peculiar problems due to the pinching of the inferior extraocular muscles in the fractured area. A very annoying diplopia may result frequently. Such a disability may also be coupled with the presence of orbital haemorrhage, injury to optic nerve, infection and fatal meningitis. The blow out fractures usually act as a

'safety valve' and protect the eye ball from serious injury.

Such fractures of the orbital floor also pose a diagnostic problem. Routine roentgenography may not reveal any evidence of floor fractures. Usually an evidence of limitation of ocular movements or obscuration of the maxillary antrum by a blood clot may give an indirect clue to such an accident. Special radiological procedure may be called for an occasional case to confirm the fracture.

The patient described here presented the features of blow-out fracture with avulsion of both the lids and the anterior part of scalp with herniation of globe into the maxillary sinus. Usually orbital fractures are untreated until a later date due to the general condition of the patient. If found satisfactory the repair of the orbital floor with replacement of the orbital contents into orbit should be done early. It is not advisable to delay surgery more than 10 to 14 days from the day of injury (Smith and Regan, 1957; Smith and Converse, 1960). There are two basic surgical approach for freeing and elevating the trapped orbital contents.

- (a) Antral approach after Caldwell-Luc method.
- (b) Exploring the orbital floor through an incision in the lower lid. Alternatively combination of both techniques can be used. Good results can be obtained with either method, but the antral approach should be preferred if there is any doubt about the diagnosis.

Various grafts and alloplastic materials

have been used to reconstitute the orbital floor or to raise it (graft of bone or cartilage, plastic resins, glass wool, silicon rubber or tentalum plates). The autogenous bone graft obtained from the superior iliac crest area is extremely useful for this type of procedure. However recent developments of synthetics may not judiciously indicate the use of bone graft particularly when in the orbit it is nonfunctional and bears no weight. Clinical investigation of the reliability and safety of the use of alloplastic materials for the orbital floor reconstruction was carried out by Browning and Walker (1965) in 45 cases with satisfactory results. The graft of polyethylene was comfortably retained. In the present case the Stent campo was used for repair of the floor after moulding it into thin plate. The same has been seen to have retained its position along the fractured floor on X-ray studies. No undue reaction to the compound has been observed in this case which has been followed for 10 months. The patient retains satisfactory vision in the injured eye with external ophthalmoplegia and mild ptosis.

In view of the absence of undue reaction to Stent campo, coupled with easy availability, its use in the repair of floor of the orbit is recommended. Its use may be specially indicated as an emergency or temporary measure for few months.

Summary

A case of blow-out fracture of the orbit with herniation of the globe into the maxillary antrum is presented. The floor was reconstructed using Stent campo with satisfactory repair and without any undue reaction to the compound. The literature of

blow-out fractures is briefly reviewed. The use of Stent campo for repair of floor of

orbit is recommended as an emergency or temporary measure.

REFERENCES

1. Browning, C.W. and Walker, R.B. : The use of Alloplastics in 45 cases of orbital floor reconstruction. *Amer. J. Ophth.*, 60:684, 1965.
2. Converse, J. M. : Blow-out fracture of the orbit. *Plast. & Reconstruct. Surg.*, 29:408, 1962.
3. Pfeiffer, R. L. : Traumatic Enophthalmos. *A. M. A. Arch. Ophth.*, 30:718, 1943.
4. Smith, B and Converse, J. M. : Blow-out fracture of the floor of the orbit. *Tr. Amer. Acad. Ophth.*, 64:767. 1960.
5. Smith, B & Regan, W. F. : Mechanism & correction of Internal orbital fracture. *Amer. J. Ophth.*, 44:733, 1957.