MANAGEMENT OF ORBITAL FLOOR FRACTURE WITH AUTOCLAVED X-RAY FILM

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INTRODUCTION

Blunt trauma to the orbit may be associated with the fracture of its floor as the bones of the roof and lateral wall are relatively strong. In cases with fresh trauma, the patient may present with diplopia and lid swelling. On examination there may be periorbital oedema, ecchymosis, subcutaneous emphysema, infraorbital nerve anaesthesia, dystopia, enophthalmos and damage to the globe. Edema and ecchymosis usually resolve in two weeks but enophthalmos may increase because of the orbital fat degeneration and fibrosis. Normally the eye ball is supported by the inferior suspensory (Lockwood's) ligament. In case this support is compromised, the eye ball is displaced downwards and resultant diplopia / cosmetic disfigurement is troublesome. Eye ball needs to be elevated by some implant to correct diplopia. Orbital fractures are managed by different surgical specialties including ophthalmologists, otolaryngologists, plastic surgeons and maxillofacial surgeons [1].

CASE REPORT

A 33 years old lady had a road traffic accident four years back with multiple injuries to left side of head and body including fracture of three ribs which were managed at that time. She presented with persistent diplopia which was very troublesome. There was inferior dystopia (3 mm) and exotropia (30 prism diopters) of left eye ball (fig. 1). She had narrowing of palpebral fissure due to ptosis and inferior lid elevation. Ptosis was moderate (3mm) with fair levator function (8 mm). There was restriction of upgaze. On palpation there was irregularity of inferior orbital margin. Systemic examination did not reveal any abnormality. X-ray orbits revealed fracture of left floor with soft tissue shadows in the maxillary antrum (fig. 2). CT scan orbits was advised but could not be done due to financial constraints.

After written consent of the patient for operation and photographs, orbital floor was explored through transconjunctival incision with lateral canthotomy and cantholysis under general anaesthesia. The dissection was continued through lower lid retractors approximately 3 to 4 mm below the inferior tarsal border in a plane anterior to the orbital septum, minimizing fat prolapse into the field. Once the inferior orbital rim was reached, an incision was made in the periosteum with sharp edge of a periosteal elevator. An attempt was made to reposit the orbital contents through the floor defect but not much could be done due to fibrotic changes in entrapped tissue. A 7 cm x 3 cm piece of autoclaved X ray film folded upon itself in the form of a spiral (making final size of 3 cm x 1 cm with thickness of 0.3 cm) was placed below the eyeball (fig. 3) and stitched to periosteum, to elevate and support the eyeball. Lower lid retractors were stitched with 6/0 vicryl and conjunctiva was closed with 8/0 silk. It corrected the inferior displacement and decreased exotropia to 15 prism diopters for which lateral rectus recession (6 mm) was done. It corrected diplopia in primary position. Prophylactic antibiotic and analgesics were given post-operatively. However four weeks after surgery patient presented with swelling below lateral canthus due to slight anterior displacement of the film. Sharp margin of film was visible in the inferior fornix as it had cut

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through the conjunctiva (fig. 4). The sharp margin was trimmed and a piece of Mersilene mesh 2 x 2 cm was placed over the film to prevent recurrence. Ptosis correction with levator resection (20 mm) was done six weeks after the first surgery. On 1st Post operation day after ptosis surgery, there was lid edema and mild pseudo-esotropia which was due to stretching of palpebral fissure laterally (fig. 5). Patient was advised follow-up six monthly.

DISCUSSION

Different approaches have been used for the repair of orbital floor fractures including transconjunctival and subciliary incisions, endoscopic-assisted transmaxillary [2], transcaruncular [3], combining a transconjunctival incision with an endonasal endoscopic approach [4, 5].

After transconjunctival and subciliary incisions, lid malposition can occur in a small percentage of cases. Endoscopic approach avoids this complication and offers a hidden incision [5]. This technique is especially useful in the treatment of posterior fractures or secondary repairs for residual enophthalmos. Transcaruncular approach for medial wall and floor fractures has been found to be associated with increased risk of corneal epitheliopathy with reduced vision (upto 6/60), orbital inflammation, inferior oblique underaction, superomedial fornix symblepharon at the caruncular incision site, extensive subconjunctival hemorrhage and a suture-related conjunctival granuloma [3].

Different substances have been used successfully for reconstruction of the orbital floor. The options for orbital floor implants include autogenous grafts (e.g., bone, cartilage, fascia) and alloplastic materials (either permanent or absorbable). Among autogenous implants, bone grafts [6] are most typically used. Alloplastic implants can be categorized as nonporous, porous, and absorbable. Nonporous implants include metallic implants (usually composed of titanium[7], stainless steel or vitallium) such as miniplates, microplates, and grids or mesh. Additional nonporous orbital implants include silicone, supramid, prepunched nylon foil [8], Teflon and X-ray film [9]. Porous orbital implants include hydroxyapatite and high-density porous polyethylene. Hydroxyapatite is hard and brittle whereas high-density polyethylene (Medpor) [10,11] can be fabricated to be thin and malleable enough to be fitted into the orbit while still providing good structural support. Absorbable implants [12], such as Gelfilm and polygalactin (Vicryl) are generally limited to smaller fractures. Iliac crest bone grafts are difficult to harvest. The resorption rate of free

Fig. 1: Preoperatrive Left inferior dystopia, exotropia and ptosis.

Fig. 2: X-ray Orbits showing fracture of left orbital floor with haziness of maxillary antrum.

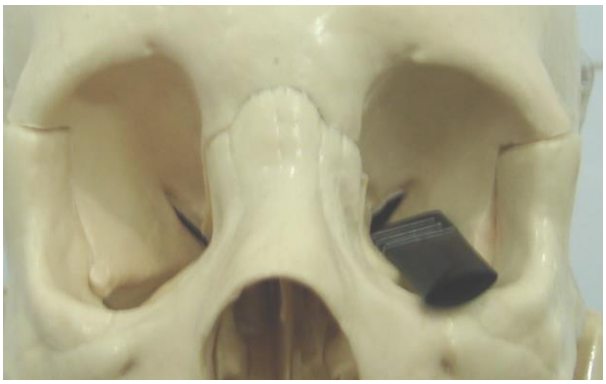

Fig. 3: Erosion of film through conjunctiva.

Fig. 4: On 1st Post op day, eyeball elevated to normal position, eye straight and normal position of eyelid.

Fig. 5: On 1st Post operation day after ptosis surgery, left eyeball in normal position with normal position of both eyelids and eye straight (Pseudo-esotropia is due to stretching of palpebral fissure laterally).

bone graft is high, but most of it is advantageous remodeling and overall outcome has been declared good. Stainless steel mesh has presented with globe penetration and squint by the (mesh) implant [13].

It is suggested that orbital floor strength is regained 24 days after repair so some physicians let patients resume normal activities approximately 3 weeks after uncomplicated orbital floor fracture repair [14].

In Pakistan there are very few tertiary referral centers where implants are properly fixed with the help of screws and they are usually not easily approachable to the majority of the population. We used autoclaved X - ray film which consisted of a film emulsion containing silver halide crystals coated on a blue – tinted plastic base. It is tough, provides enough support, is easy to use and freely available. The problem we faced was because of sharp margins and so these should be covered by some other material as we used the Mersilene. Our aim was to explore the possibility of a model that can be practiced even at the Tehsil Headquarter level. Orbital trauma may lead to multiple deformities involving bony orbit, muscles, lids and often intraocular tissues. We repaired the defects in the recommended order i.e. dealing first with the orbit, then with the extraocular muscles and finally with the lid. Orbital floor defect filling was followed by lateral rectus recession and finally the ptosis was repaired.

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