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Original Research Paper

Surgery

CASE REPORT-RECONSTRUCTION OF ORBITAL FLOOR WITH TITANIUM MESH IN A ZYGOMATICOMAXILLARY COMPLEX FRACTURE

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ABSTRACT Zygomaticomaxillary fractures are complex fractures that can involve the floor of the orbit. These fractures often lead to complications like diplopia, disability in rotation of the eye superiorly due to herniation of muscle and orbital fat into the maxillary sinus. These fractures if left untreated can result in malunion, visual disturbances and are not aesthetically pleasing due to effect on the symmetry of face. Various treatment modalities are available for the treatment of zygomaticomaxillary fracture and reconstruction of the floor of the orbit. Complications include retrobulbar hemorrhage, orbital fissure syndrome, and reduction in orbital volume, with minor effects like ectropion or entropion. A case report of a 21-year-old male patient with a Orbit zygomaticomaxillary complex fracture is described.

KEYWORDS : Orbit, Fracture, Zygomaticomaxillary complex, Titanium mesh, Reconstruction

INTRODUCTION

The fracturing of the orbit can be explained by one of two explanations. Hydraulic theory is the first of the theories. The fractures, according to this notion, are caused by the force of the orbital contents on the floor. The blocking theory is the second hypothesis. According to this view, the fracture of the orbital floor occurs as a result of force transfer from the orbital ridge to the floor of the orbit. Various methods have been introduced for the correction of the orbital fracture which includes the use of maxillary sinus wall (Mandel, 1975), chromium cobalt or Gold mesh (Kummoona, 1976), Lateral plate of mandible (Laskin,1977). Iodoform packing of sinus was also done to maintain globe position (Folkestad & Westin, 1999). The orbital floor fractures are recently treated with titanium mesh, which is a bioinert material. It's simple to manipulate, adjust, and fix to the orbit's floor.

CASE REPORT

A 21-year-old male patient presented to our oral and maxillofacial unit with the chief complaint of pain and swelling in the right midface region, as well as inability to open the right eye. On extraoral examination swelling was noticed in the right zygomatic arch region. Lacerations were present in the right eyebrow and right infraorbital region which had been sutured in the previous first aid clinic. There was subconjunctival ecchymosis and circumorbital oedema. On palpation, tenderness was present in the arch region along with step deformity in the right infraorbital and right frontozygomatic suture region. The upward movement of the eyeball was restricted with diplopia in the upward gaze. Vertical orbital dystopia was present with right eyeball at a lower level (Figure 1).

Figure 1

A CT scan in both coronal and axial views was taken along with 3DCT facial bones for the accurate diagnosis. The CT scans revealed fracture of the floor of the orbit, lateral wall of orbit with lateral rotation of the zygomatic fracture along with the fracture of Frontozygomatic suture, zygomatic arch and maxillary anterior wall. The final diagnosis was orbito-zygomaticomaxillary complex fracture.

The treatment done was with open reduction and internal fixation with the reconstruction of the floor of the orbit using titanium mesh under general anesthesia. The reduction, fixation and reconstruction followed the following sequence:

1. Elevation of Arch through gillies temporal approach
2. Reduction and Fixation of Frontozygomatic Suture
3. Reduction and Fixation Zygomatico maxillary buttress

Reconstruction of Floor of orbit with Titanium mesh (figure 2), and

4. Reconstruction of Floor of orbit with Titanium mesh (figure 2)

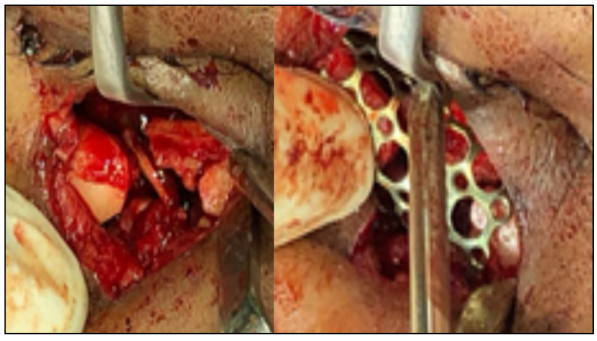

Figure 2: Exposure & Reconstruction Of Floor Of Orbit With Titanium Mesh

After the fractures were stabilised and fixed, the wounds were closed in layers. Before closing the skin, 4-0 vicryl sutures were used to place intradermal sutures with buried knots. The skin was closed with simple interrupted 5-0 prolene sutures that were removed fourteen days later. The patient was discharged with no complications. After 2 months, postoperatively, the patient had shown good healing and correction of vertical dystopia. There was no indication of restricted eyeball movement or diplopia (figure 3).

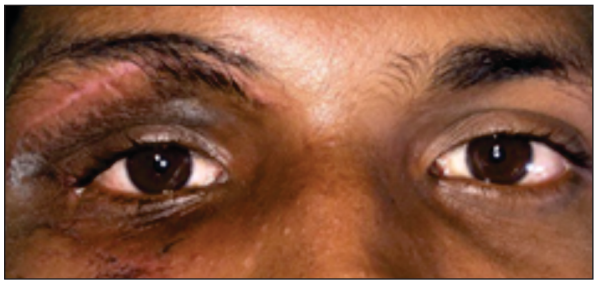

Figure 3: 2 Months Follow Up

DISCUSSION

Various materials are used for reconstruction of orbit like perforated plates (Tesnier, 1978), silicone implants (Berkowitz, 1981), alloplastic materials, cobalt chromium and gold mesh (Kummoona, 1976), bone grafts, hydroxyapatite, titanium mesh etc. But some of the them have shown complications and some of them cannot be used in larger defects. Cortex of contralateral coronoid process can also be used for orbit reconstruction. But postoperative trismus is noticed (Mintz, 1998). Chronic sinusitis can occur in cases where anterior wall of maxilla is used(Mandel, 1975). Infections are seen with silicone implants. Paresis is also observed when silicon implant was used (Berkowitz, 1981). Iodoform gauze had show high incidence of post-operative diplopia (Folkestad & Westin, 1999). Bone grafts show resorption and morbidity. They are also difficult to adapt (Constantian, 1982). Alloplastic materials have shown inflammatory reaction. Hyperplastic lesion was seen in case of silastic implant (Sewall, 1986). Xenografts are also used, but there is an evidence of postoperative complications. There is a risk of development of enophthalmos (Webster, 1988). In case of materials like hydroxyapatite, there is difficulty in application due to mechanical resiliency (Hes, 1990).

Ceramic Hydroxyapatite can be made using CAD-CAM but is costly (Ono, 1994). Porous polyethylene sheets with or without channels are also used (Choi, 1999)(Roth,1999). Titanium mesh can be used for floor reconstruction. It can also be used for correction of enophthalmos post-operatively (Wang, 1995). There is a disadvantage of adherence of tissues to titanium mesh (Silva, 2015), which can be treated with hyaluronic acid fillers (G. H. P. Lee & Ho, 2017) or placing an interface membrane (Silva, 2015). The intraoperative complication while manipulation of orbit results in Oculo-cardiac reflex which can be controlled with use of Atropine (Joseph, 2009)(Vasudev & Reddy, 2015). One of the postoperative complications include loss of vision, orbital apex syndrome, which is due retrobulbar haemorrhage (Hwang, 2014). This can aggravated by cold temperature and smoking (D. W. Lee, 2021). Another cause includes intra-orbital oedema (Susarla, 2016). Late complication also includes enophthalmos which can be corrected by brow's approach in lateral wall (Tümerdem & Kuran, 2006). It can also result due to not treating the fracture resulting in silent sinus syndrome (Février, 2017). Diplopia can also occur. Special care should be taken in case of flu as sneezing can result in orbital emphysema and diplopia (Vairaktaris, 2008).

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