



Reconstruction of Fronto-Zygomatico-Orbital Complex Post Traumatic Malunion with Eyelids Correction: Case Report

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Abstract

Reconstruction of delay fronto-zygomatico-orbital complex with orbital floor fracture remains as one of the most pressing issue at steady posttraumatic deformations treatment. The disfigurement of posttraumatic scarring lies in both the physical deformity and psychosocial ramifications of patients. A case of delay fronto-zygomatico-orbital complex malunion reconstruction with eyelids correction is presented.

Keywords: Fronto-zygomatico-orbital complex; Delay fractures; Titanium mesh; Posttraumatic scarring; Malunions

Introduction

As part of the trauma of the upper third of the massive face, the fronto-orbito-zygomatic arch is the most frequent and is often associated with eyelid involvement [1]. Patients with this kind of fracture always suffer from seriously damaged appearance and significant dysfunction [2-7]. Complex orbital fracture requires reconstruction to restore ocular function and aesthetics as soon as possible [2,6,8]. However, evaluation and treatment of complex injuries of craniomaxillofacial region require a delay for purpose of neurological stabilization [2]. In such cases permanent facial deformities exist and surgical intervention is technically much more difficult, even impossible and pose a significant risk [2]. Successful orbital and periorbital reconstruction following traumatic fracture depends on thoughtful preoperative planning; meticulous operative dissection and proper selection of implant type, size and contour [3]. However, surgical reduction of delay craniofacial traumas is generally challenging for surgeons, because of involvement of various adjacent structures (eyes, paranasal sinuses etc.) and lack of landmarks [6]. Some of the critical factors that contribute to the complexity include anatomy, presence of vital structures adjacent to the affected part, uniqueness of each defect and chances of infection [4]. Obtaining acceptable results is still difficult in delayed cases because of the loss of bony landmarks and presence of scar tissue [5,6]. Soft-tissue treatment was more difficult, especially the eyelid. The eyelid must be treated as soon as possible to avoid corneal lesions and major complications like total vision lost [1]. Even in experienced hands, good and satisfactory esthetic results are only found in 77% of cases [7]. A case of post accidental fronto-zygomatico-orbital complex malunion reconstruction with eyelids correction is presented.

Case Report

A 43-year-old male patient was admitted to ENT and Maxillofacial Surgery department with a complaint of left midface and eye region scarring and deformity. He gave a history of car accident one year ago. According to data he gave, he has a craniocerebral trauma with brain injury and subarachnoid hemorrhage with bone fracture in left front temporal region. He was hospitalized in Intensive Care Department for a month under resuscitators and neurosurgeons care. On the day of admission the patient was overreacted, poor oriented. He mentioned anticonvulsant in taking after first hospitalization. On external examination face asymmetry was observed due to posttraumatic deformation of the left fronto-zygomatico-orbital region, eyeball downward displacement, scars and soft tissue bulking of periorbital region (Figure 1). On CT scan examination multiple malunions and pronounced displaced fragments of left fronto-zygomatico-orbital complex was observed. Blow out fracture with eyeball displacement was also persist (Figure 2A-C).

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Figure 1: External view of patient before operation.

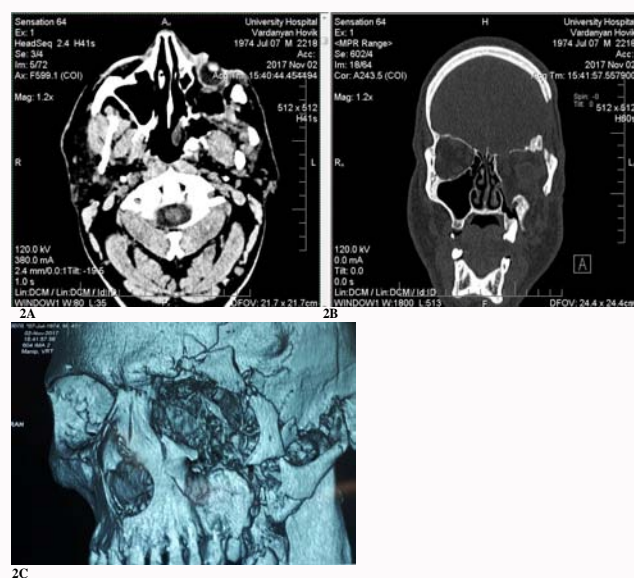


Figure 2A-C: CT scan images before operation.

Piezotom assisted refracture and reconstruction with titanium plates and mesh was planning for this patient. Fringing periorbital and supraorbital transcutaneous incision was performed, due to the better scar revision and access to fractured fragments (Figure 3A). Supraorbital wall deformity was refractured using Piezotom and reconstructed with titanium mini plates (Figure 3B,C). In such manner was reconstructed zygomatico-frontal and zygomatico-maxillar area. The fragments of infraorbital region were also released from surrounded scarred connective tissues, repositioned as possible and fixed with titanium mini plates and screws. Titanium mesh was hand adapted to the orbital floor and reconstructed inferior orbital rim and fixed with screws (Figure 3D). The scarred soft tissues around eye were incised and removed. Upper blepharoplasty was performed for upper eyelid scars esthetic correction (Figure 3E,F).

On the control follow-up examination after eight month the patient was satisfied with his esthetic results (Figure 4). On CT scan examination the shapes of fronto-zygomatico- orbital complex were as possible restored (Figure 5).

Discussion

Orbitozygomatic injuries are among the most common fractures encountered by the plastic surgeon [8]. Severe esthetic and functional sequelae can occur in cases of trauma to this region, including



Figure 3A-F: Operation steps.

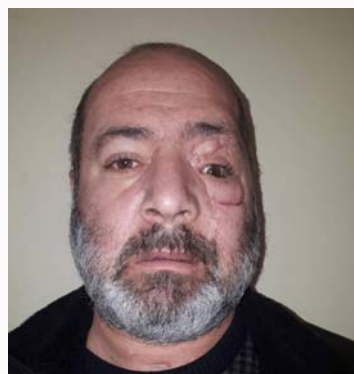


Figure 4: External view of patient after 8 month post-op.

enophthalmos and diplopia, as a result of swelling of the orbit due to orbital floor fracture and herniation of the ocular content into the maxillary sinus [9,10]. The case of fronto-zygomatico-orbital complex delay fracture with fragments displacement and eyelids severe scarring is presents. Impairment of maxillary sinus and eye (vision loosing) has brought to additional functional disorders as a result.

Attentive physical and CT examinations, diagnosis, and multidisciplinary approach are essential for appropriate management of such kind of fractures [8]. Adequate exposure and mobilization of fracture segments is essential for successful anatomical reduction and functional recovery [9]. However, in delayed fractures malunions are occurred, and anatomical reduction requires osteotomy (refracture),

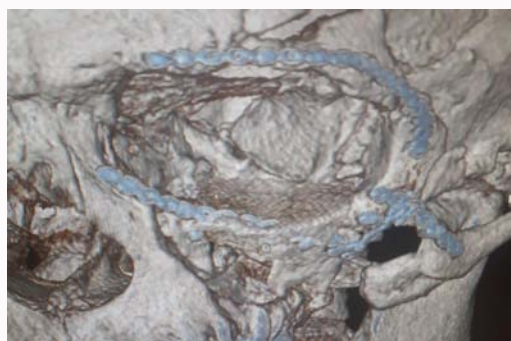


Figure 5: On CT scan examination the shapes of fronto-zygomatico- orbital complex were as possible restored.

which could brought to bone length and small fragments lost [2]. In presented case osteotomy of malunions was performed by Piezotome, which minimizing bone damage and lost.

As mentioned Parthasarathy J, computer-aided individually shape-adapted fabricated titanium mesh for the mirroring-reconstruction is a promising method for the correction of post-traumatic defects [4]. The computer-aided design/computer-aided manufacturing CAD/CAM implants system and mirroring technology can help improve the outcome of surgery when repairing such fractures [6,11-13]. 3D printed models as a pre surgical template help to adapt a titanium mesh or plate precisely to the defects of the orbital wall, which helps to reduce surgical time. [11,14]. However, these technologies are expensive and require technical equipments, which are not available in many clinics [15]. In cases of technical possibilities absence for 3D printed models, preoperative CT measuring and intra operation titanium mesh adapting are successfully obtained [5,15,16].

So, in presented case was decided to reconstruct bone contours and orbital floor with titanium mesh and miniplates with screws, which was finally adopted intraoperatively. The difficulty was in absence of most of landmarks for proper positioning of multiple bone fragments, which were notably dislocated with fibrous tissue accretion.

Another challenge after bone fragments reconstruction was soft tissues scars care. The disfigurement of posttraumatic scarring lies in both their physical deformity and psychosocial ramifications [16,17]. Severe posttraumatic scarring of periorbital region was observed in patient. Upper eyelid scars incision and blepharoplasty was perform with partially incision of lower eyelid bulking soft tissue mass with good for this case results. Secondary operation for periorbital soft tissues additional correction may require.

Conclusion

The case shows that refracturing of delayed fronto-zygomatico-orbital complex fractures malunions by Piezotom less traumatic and time consuming. Bone fragments repositioning and fixation, as well orbital floor reconstruction performed with hand adapted titanium mesh and miniplates with good esthetic results. Scar revision not less essential for final esthetic results. Severe scars managing are difficult in their implementation and could affect even excellent performed reconstruction.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

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