

## TANSFACIAL APPROACH FOR MANAGEMENT OF ZYGOMATICOMAXILLARY COMPLEX FRACTURE- REPORT OF TWO CASES

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### INTRODUCTION

The zygomaticomaxillary complex (ZMC) with its prominent convexity in the face is highly vulnerable to injury. It represents second most common fractures of facial skeleton after nasal bone.<sup>1</sup>Its fractures are inherently unstable due to; corner stone position, attached superficial muscular aponeurotic system (SMAS) and strong masseteric muscle downward pull. These and other factors cause displacement of ZMC in various directions depending upon the direction and magnitude of injury. The ZMC is also called beauty bone, its fractures effect facial aesthetic and produce functional disabilities like trismus, restricted lower jaw movement, altered sensation of the cheek area and ophthalmologic consequences.<sup>2,3</sup>Less than optimal results of restoration of form and function even after some form of fixation of fractured ZMC to its pre injury state have resulted in variety of techniques with no gold standard. Various approaches like Gillies, Keens, Dingman, Transconjunctival, Sub ciliary, Infra orbital and Coronal along with one point to four point fixations have been used to stop post reduction displacement and sub optimal results of operated ZMC cases. In these two case reports, we evaluated a newer approach to the reduction and fixation of ZMC fractures with optimum aesthetic results. It helps prevent the sequel of post traumatic malar depression, a cause of unaesthetic facial appearance and restricted jaw function.

### CASE REPORT 1

A 53 years old male patient reported to Maxillofacial Surgery Department of Armed Forces Institute of Dentistry, Rawalpindi with history of road traffic accident while riding a motor bike. He was not wearing

helmet while driving. History of bleeding form nose and mouth was positive. Clinical examination revealed facial asymmetry and sub conjunctival hemorrhage right side of eye. Mouth opening was restricted along with tenderness on right side lateral orbital wall and infra orbital margin. Restricted mouth opening with deranged occlusion was noted. Maxilla was mobile at Lefort II level. No altered sensation was noted. PNS view of face x-ray and CT scan was requested. On the basis of history, detailed clinical examination and radiographic assessment, diagnosis of right ZMC and maxilla Lefort II fracture was made. Patient was prepared for open reduction internal fixation under general anesthesia as inpatient case. After pre anesthesia assessment and informed written consent, patient was prepared for surgery. A combination of lateral eyebrow and trans-orbital approaches was used for reduction and fixation.

A 5 inch long mini titanium plate was adapted and fixed by passing it below the arch through lateral eye brow incision and brining it behind the zygomatic buttress to the front of maxilla. Then both ends of this long mini plate were fixed at frontozygomaticsuture area above and naso-maxillary buttress of anterior maxilla below after optimal reduction of ZMC. 4 holes mini plate was also used to fix left zygomaticomaxillary buttress areas after temporarily placing the patient into MMF. Both fixing areas of the long 5 inch mini plate define the prominence of face and are placed well ahead of ZMC in the face. It also gives advantage for addressing projection which is the most important aspect required attention during reduction and fixation, along with post reduction stability. We prefer to fix first at nasomaxillary area and take the advantage of pull force applied through the plate for adjusting the final position of ZMC. It also helps customizing the size of the plate by cutting of the upper end of the redundant plate emerging through the lateral eye brow incision. Wounds were closed in layers, after achieving homeostasis and MMF was released. Recovery was uneventful and patient was prescribed antibiotic, analgesics and three doses of steroids along with other post operative instructions including nasal precautions. Patient was discharged on second post operative day with instructions. Follow up was carried out after one week and one month. Patient was evaluated clinically as well as

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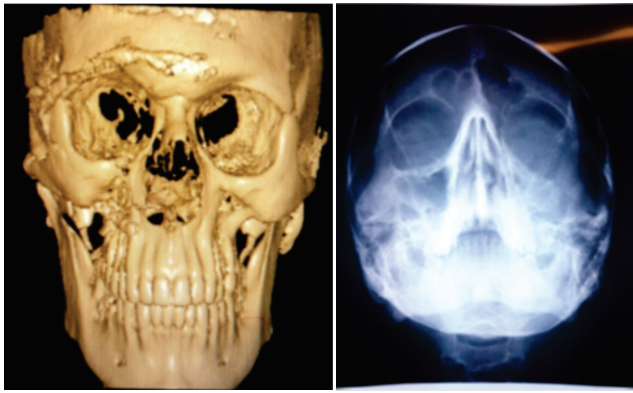


Fig 1: Pre op 3D CT Scan and PNS view of patient.

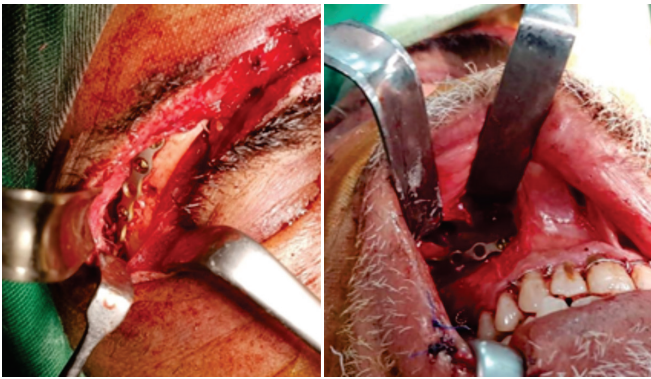


Fig 2: Fixation of plate at zygomatico-frontal and zygomatico-maxillary buttress area.

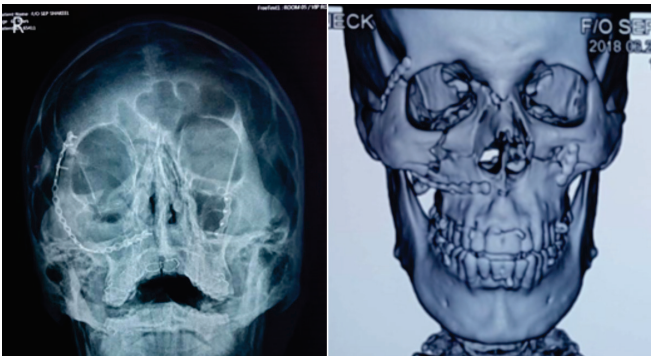


Fig 3: Post op PNS view and 3D CT scan of the patient.



Fig 4: Pre operative view of patient with pre op PNS view.



Fig 5: post op view of the patient and post op 3D CT scan.

radiologically using CT scan and compared with pre operative findings. Malar depression, facial asymmetry and mouth were compared.

### CASE REPORT 2

A 30 years male reported with three days history of road traffic accident. History of nasal bleed was positive. Clinical examination revealed swelling of left side along with sub conjunctival hemorrhage and peri orbital ecchymosis. Radiographic investigations include PNS view of face and CT scan, which confirms diagnosis of ZMC fracture left side. Patient was planned to undergo ORIF with transfacial approach. Same steps were followed as in case one. Post operative recovery was uneventful. Patient complained of limited mouth opening, for which mouth opening exercises were advised.

### DISCUSSION

As zygomaticomaxillary complex fracture is the second most common fracture of the midface, its management is always challenging. Road traffic accident is the most common cause of ZMC fracture and numbers of classifications have been developed based on the anatomy and displacement of fracture. These fractures generally are displaced posteriorly and inferiorly but quite frequently they are displaced posteriorly, inferiorly and medially.<sup>4</sup> Management of ZMC fractures is a challenge because of its anatomic position and attachments, which tend to destabilize it. Minimally displaced fractures sometimes do not justify close or open reduction, while a large proportion of fractures are amenable to open reduction by various methods. Transfacial technique may be suitable for some of the displaced and comminuted ZMC fractures.<sup>5</sup>

Majority of ZMC fractures are managed appropriately with open reduction and internal fixation. Anterior and posterior approaches have been used for ORIF, along with a diverse opinion to what approach is more appropriate for this purpose. Similarly, there is debate

regarding what qualifies an adequate fixation. Opinions also vary on whether one or four point fixation is required for adequate fixation and stabilization.<sup>6</sup> Some studies suggest one point fixation is sufficient for stable fixation of ZMC fractures, while others suggest that four point fixation is necessary including zygomatico-sphenoidal suture as well.<sup>7</sup> Sinus packing sometimes also used to support so as to provide stability after reduction and fixation. This technique can effectively address zygomatico-sphenoidal suture and sinus packing needs for optimum reduction and fixation.

Patient specific plate through custom made model using CT scan data and adopting a long mini plate pre operatively from the origin of zygomatic arch to the contralateral subnasal area for stabilizing facial outer frame is used for adequate stabilization of ZMC fractures.<sup>8</sup> We used a new technique i.e. transfacial fixation for ZMC fractures, which provides optimal solution for adequately stable fixation as it not only holds ZMC from beneath it which prevents ZMC to displace again after reduction and fixation, but also bring displaced ZMC fracture anteriorly for restoration of projection. In cases of comminuted fractures, posterior approach is used in combination for fixation at zygomatic arch, which results in extended soft tissue stripping ultimately resulting in sub optimal outcome. The combination of posterior and anterior approaches also resulted in wide scar and nerve damage. Transfacial technique provide stable fixation while avoiding these complications. If we compare transfacial technique with pre-fabricated approach for outer support, there is minimal exposure and soft tissue stripping in transfacial fixation technique.

However, this technique may be used with caution in severely comminuted cases of ZMC fractures along with other fixation methods.

## CONCLUSION

Treatment outcome was satisfactory in our case. No per or post operative complications were noted. During follow-up, patient had satisfactory facial symmetry, no noticeable scar and no functional impairment. However due to small number of patients operated by transfacial technique, and shorter follow up time, further large scale, multicenter studies are recommended.

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