



Management of Panfacial Trauma: A Case Report

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Abstract

Pan facial fractures being the most complicated fracture as it involves multiple fractures of lower third of the face, the mid-face and the upper third, and so the management of such multiple fractures is extremely complicated. Proximity of the maxillofacial region with features or senses such as vision (diplopia), olfaction, respiration (airway), mastication (occlusion) or chewing, deglutition and aesthetics; contributing in complexities of fracture management, also creates a dilemma for surgeon itself from operating point of view while keeping vitals in mind. The inaccessibility to the fractured site and its reduction is often iatrogenically left uncorrected leading to deformity.

The establishment of pattern of repairing the pan facial fracture is the most challenging and require great experience as well as knowledge, as it vary with each case. All the vertical and horizontal pillars has to be made to restore and rehabilitate the facial anatomy and aesthetic. After all the aggressive treatment, the residual deformity of facial trauma is not uncommon, which often require a second stage corrective surgery. This article briefs about the management and simple approaches used to reduce and fix a case of pan facial trauma in a 23-year-old male who underwent a road traffic accident.⁽¹⁾

Keywords: Pan facial fracture, Upper third fracture, Mid face fracture, Nasal fracture, Open reduction and internal fixation.

Introduction

Panfacial fracture includes the multiple fracture of facial bone in which the maxilla, zygomatic complex, nasoethmoid-orbital region are the commonest bone which get fracture¹³ with mandible^(2,3). An experienced surgeon also found it difficult to operate due to multiple fragments and loss of reference point which otherwise guide the facial reconstruction. These multiple bony injury is often associated with soft tissue injury, destruction of facial bony framework and malocclusion. The facial deformities refer as

“dish” face deformity has loss of facial height or projection with increased face width and enophthalmus.⁽¹⁴⁾ There are varying techniques for management of these type of fractures, here when have described the inside-out sequence for reduction of panfacial bone fracture.⁽³⁾

Epidemiology of Panfacial Bone Fracture

The more the velocity of trauma more the destruction and fragmentation of bone occurs, as the facial framework involve multiple bones therefore high energy injuries are the commonest cause of pan facial injury (road traffic accident,

gunshot injuries). The incidence for such injury is 4-19% for all facial fractures. In Rajasthan the incidence is around 6.59% of all facial injuries and symphysis fracture is common in mandible (33.5%), followed by condyle (31.1%) and body of mandible (17.1%)⁽⁴⁾

History of the Management of Panfacial Fractures

In early 80s and 90s craniofacial surgeons have established the principles for pan facial injury management which included direct visualization and wide exposure for alignment and reduction of craniofacial bones, on application of these principles the sequence of restoration and rehabilitation is influenced⁽⁵⁾. The principles of facial buttresses and pillars emphasize the restoration of facial skeleton and the reconstruction of pan facial injury begins with reduction of frontal bone followed by mid facial bone alignment⁽⁵⁾. Using maxillary framework as a template the lower face is constructed in last that is in top-to-bottom sequence. The advantages of rigid internal fixation guide the surgeon to initiate reduction from condyle which proved the posterior facial height, and restoration of this height allows strongest bone of facial skeleton to be use as a template, that is mandible⁽⁴⁻⁵⁾. Due to this bottom to top sequence is most widely used in management of craniofacial surgery today.

Case Report

A 23-year-old male patient reported to Mahatma Gandhi Hospital at Jaipur with a history of road traffic accident. There was a history of unconsciousness and vomiting with bleeding from his nose. On clinical examination there was Sub-conjunctival ecchymosis and deranged occlusion. Patient was stabilised and thoroughly examined to rule out multisystem injury with CFS rhinorrhoea. Lip lacerations were sutured using 3-0 vicryl & 4-0 ethilon under local anaesthesia with adrenaline (1:80,000).

Clinical examination and radiographic analysis revealed Le-forte II facial fractures involving bilateral Nasal orbital ethamoidal(NOE) bone,

bilateral maxillary bone with palatal split, right parasymphysis bone with avulsed tooth. Patient was informed about need for surgical intervention and informed written consent was obtained. All the routine blood investigations were made which are required for surgery to be done under general anaesthesia. Nasal intubation was done for induction of GA^(12,13).

Patient underwent open reduction and internal fixation of the panfacial fractures using lower degloving incision for right parasymphysis, and fracture was stabilized using sterilized AO titanium plates and screws at every fracture site for fixation of bone. After the fixation of fracture with titanium AO miniplates was done, the site was closed with 3-0 vicryl and 4-0 ethilon. Palatal split was managed by traction wiring with closure of ora-antrum fistula with 3-0 vicryl followed by palatal plate. Oral hygiene was maintained using chlorhexidine irrigation. Postoperative medications were advised including antibiotics and analgesics. Extra oral sutures were removed after a week. Patient recovered with uneventful healing. Patient was advised soft diet for one month. Postoperative stability and functions were satisfactory with an imperceptible scar.

A second stage surgery was done under general anaesthesia for retrieval of titanium miniplates after 4 months of surgery on complete uneventful healing of bones followed by global dental implant (in second stage surgery) in the region of lower right canine and first premolar.



CT Scan with 3D Reconstruction



Deranged Occlusion



15th day post operative



Plate on right parasymphysis



Implant placed



Plate on right Zygomatic buttress



OPG after Implant Placement



Left Nasal bone reduced and fixed with merocele



3 month follow up



6 month follow up

Discussion

The pan facial fracture is simultaneous fracture include the cranium (lower, mid and upper third of face) and mandible.^(6,11) Reduction and fixation of these fractures is aimed for rehabilitation of patients functional, anatomical structures and three dimensional contours of face^(7,16). Patient's brief history tells about the cause and mode of injury which gives an idea about the level of force delivered to the bone and the extent of injury as well. Since the pan facial trauma involve multiple bones of face hence it is associated with number of vital senses and organs, so often involve other speciality reference too.⁽¹⁵⁾ According to Markowitz the fracture of palato-alveolar bone and frontal bone make the pan facial trauma more extended one. The horizontal and vertical buttresses make the framework of face and also helps in transmission of mastication force to the base of skull. The facial buttresses absorb the forces and prevent its transmission to brain. The buttress of face are like pillars and hence need to be reduce and stabilize properly for complete rehabilitation of facial structure and profile. Proper alignment of facial skeletal provide functional and anatomic stability to middle third of face. With all these bony structures, a complete attention is also require for nasal projection in NOE fracture as it can alter the facial profile, left uncorrected may led to saddle nose deformity, epiphoria, telecanthus etc^(7,13).

It has been observed many times that in case of RTA the facial injury which occur is usually bilateral, in such cases the rout of intubation may

change from oral to any other as it may hinder the management of injury so, submental intubation is most preferred one and easy to do without involvement of any super specialized instruments. Patients with pan-facial trauma should be taken care according to Advanced Trauma Life Support (ATLS) guidelines as stated by Robert Marciani After clinical examination, confirming the diagnosis with the help of imaging techniques followed by surgical intervention, we have done the same in this case report. To avoid the post operative deformity and undesirable aesthetics, early surgical intervention is must to perform. The patient was operated after 4days of trauma, on complete clearance from medicine, neurosurgery and other specialized department.^(8,9) After intubation local incisions were made in this case instead of coronal incision which may leads to complications like sensory complication, scar alopecia etc. Occlusion was achieved by maxillo-mandibular fixation also brings maxilla in its proper position. Mini plates were used for stabilization and fixation of Naso-orbitaoethamoidal complex owing to their success as reported by Michelet⁽⁹⁾.

Conclusion

Thorough anatomical knowledge and expertise of the maxillofacial surgeon is must for managing a case of pan facial trauma using either of the approaches. To conclude; a minimally invasive approach should be used to treat the panfacial fractures⁽¹⁵⁾. Early surgical intervention to reduce and fix the fractures using miniplate osteosynthesis after stabilising the trauma patient yields good postoperative results. Patients with complex facial injuries should be informed pre operatively regarding the need for a secondary correction surgery at a later stage. The surgical approach to facial fracture management should focus on attaining proper occlusal, vertical and horizontal relationships of the facial frame along with restoration of orbital, oral and nasal cavities^(9, 10).

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