ORIGINAL RESEARCH PAPER
Volume-8 | Issue-12 | December - 2019 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

MANAGEMENT OF PANFACIAL TRAUMA: A SURGICAL QUANDARY FOR MAXILLOFACIAL SURGEONS

Surgery

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ABSTRACT

Patients with multiple fractures involving upper third of the face, the mid-face and the lower third are generally referred to as Panfacial fractures. 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. The goal of treatment as with all facial fracture is to restore both the functions and pre-injury 3-dimensional facial contours. To achieve this goal two common sequences of management of Panfacial fractures are proposed, “Bottom up and inside out” or “Top down and outside in”. This article briefs about the management and simple approaches used to reduce and fix a case of pan facial trauma in a 29-year-old male who underwent a road traffic accident (RTA).

KEYWORDS

Panfacial Trauma , Open Reduction And Internal Fixation, Bottom Up -inside Out

1. INTRODUCTION:

Panfacial fractures are those involving the mandible, maxilla, and zygomatic complex at the same time and usually accompanying naso-orbito-ethmoid (NOE) and frontal bone fractures. They are often associated with soft tissue injuries and loss of bony structures that can lead to severe post traumatic deformities and disabilities like malocclusion, dish face deformity, enophthalmos[1,2]. These fractures are caused by high velocity trauma, motor vehicle collisions, assaults, sports related accidents, industrial accidents, and gunshot wounds[3].If treatment is not carried out soon after the injury, facial bone fractures often mal-unite, soft tissues shrink and contract, and scarring occurs, all of which makes the delayed treatment very difficult[2]. Historically, these fractures were treated conservatively, which led to significant postoperative problems, including crippling malocclusion, significant increase in facial width, and decreased facial projection[4]. As no clear classification of panfacial bone fractures is available, various sequences of reduction (bottom-to-top, top-to-bottom, inside-out, and outside-in) are used in combination to restore facial contour[5,6,7].The bottom-to-top and outside-in” approach is the most widely used method in the panfacial bone reduction [5,6,7,8,9]. Bottom-to-top sequences focus on the mandible, which is the strongest bone of the facial skeleton and provides a buttress that can be related accurately to the cranial vault through rigid internal fixation [7].

2. CASE REPORT :

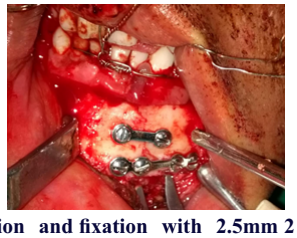
A 29 year old male patient involved in RTA reported to the department of oral and maxillary surgery with chief complain of difficulty in chewing, limited mouth opening ,malocclusion and facial asymmetry. on clinical examination there was right sided periorbital edema, conjuctival hemorrhage, depressed malar prominence and malocclusion. consensual light reflex of both eyes were normal, no ptosis or proptosis, no telecanthus & no hypertelorism. There was no history of loss of consciousness and vomiting Radiographic and 3-dimensional CT images showed left sided paraysymphysis, right body, right infraorbital rim, right lateral orbital rim fracture.(Fig. 1)

3Dimensional CT Face showing panfacial trauma (Fig. 1)

Patient was advised for surgery and an informed written consent was obtained. All routine blood investigations were done which were required for surgery under General Anaesthesia. Nasotracheal intubation was favourable as the patient had mandible fracture. After achiving good occlusion intermaxillary fixation was done.(Fig. 2)

Occlusion achieved after intermaxillary fixation (Fig. 2)

Patient first underwent open reduction and fixation of left parasymphysis fracture using vestibular incision. "Bottom up" and "outside in" technique was used.(Fig. 3)

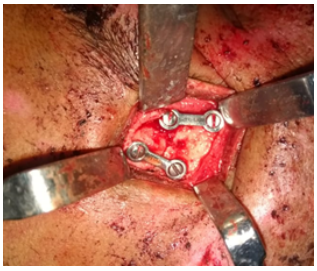


Fracture reduction and fixation with 2.5mm 2 hole and 4 hole miniplates and 10 mm screw (Fig. 3)

Next , open reduction and fixation of right side body fracture with 2mm 4hole mini plate with 10 mm screw using vestibular incision.(Fig. 4)

Fracture reduction and fixation with 2mm 4 hole miniplate and 10 m m screw in right side body fracture(Fig. 4)

Next fracture at right lateral orbital rim exposed and after establishing reduction, it was fixed with 2mm 2 hole miniplate with 6mm screw.(Fig. 5)



Fracture reduction and fixation using two 2 hole 2mm mini plate with 6mm screw at lateral orbital rim(Fig.5)

Next right infraorbital rim fracture was exposed using subcillary incision, fracture line was visualized , reduced and fixed with 4 hole 2mm mini plate. With 6 mm screw. (Fig.6)

After placing miniplates incisions were closed in layers using 3-0 vicryl and 4-0 ethilon. Oral hygiene was maintained using betadine irrigation. Maxillo- mandibular fixation was released after the surgery was over. Postoperative medications were advised. Extra oral sutures were removed after a week. Patient recovered and healing was uneventful. Patient was advised soft diet for one month. Postoperative stability and functions were satisfactory with an imperceptible scar.

Fracture reduction and fixation with 4 hole 2mm orbital shaped miniplate and 6mm screw at right infraorbital rim(Fig.6)

Immediate postoperative radiogragh showing miniplates fixation at various fracture sites(Fig.7)

3. FOLLOW UP

Patients was reviewed post-operatively for healing of extraoral and intraoral wounds, oedema, pain and occlusion. Post-operative occlusion achieved was satisfactory. Extra-oral and intra-oral wounds healed well. Oedema and pain subsided in 4-5 weeks.

Postoperative radiograh after three month showing miniplates at various fracture sites (Fig.8)

4. DISCUSSION

Pan facial injury management is complicated and challenging, because its sequelae not only includes loss of bony and soft tissue landmarks but also affects the function and facial aesthetics associated with it.10]. Panfacial fracture is a term to define those fractures involving the upper, middle and lower face[11]. Reduction and fixation of these fractures is aimed for rehabilitation of patients functional, anatomical structures and three dimensional contours of face[12,13]. 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[12,14]. Patients with pan-facial trauma should be taken care according to Advanced Trauma Life Support (ATLS) guidelines. Various skin incisions and methods of osteosynthesis have been advocated, but there is no consensus among the surgeons for the treatment of facial fractures. Owing to the potential complications of the coronal incision viz. scar alopecia, sensory complications etc; local incisions were used to stabilise and fix the fractured fragments in this case. Yang et al., reported the satisfactory effects after following the "Bottom up & outside - in" sequence which was also used in this case and helped in stabilising the mandibular fracture . Maxillo-mandibular fixation was done and occlusion was attained which ensured maxilla is in proper position. Zygomatic complex was reduced and fixed on right and left side to correct transverse and antero-posterior dimensions of the face[7]. Mini plates were used for stabilization and fixation of panfacial trauma owing to their success as reported.

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 [16,17].

ACKNOWLEDGEMENT:

The authors would like to thank the patient and parents for consenting to write up this case report.

CONFLICT OF INTEREST:

The authors confirm that they have no conflict of interest.

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