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MANAGEMENT OF PAN-FACIAL TRAUMA IN A 74 YEAR OLD MALE PATIENT -

A CASE REPORT

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ABSTRACT

Patients who have numerous fractures affecting the midface, lower third, and upper third of the face are sometimes referred to as having pan facial fractures, and treating these situations is quite difficult. A surgeon operating in the maxillofacial region faces a slightly more complex scenario than one operating in any other part of the body because of the region's proximity to important features or senses, including visual function (diplopia), olfaction, respiration (airway management), chewing or mastication (occlusion), deglutition, and aesthetics. Persistent deformity results from the inability to immediately visualize and minimize all of the components of a pan face injury as well as from the shattered bones' poor stability. It is difficult to heal the pan face fractures according to a predetermined plan. Every case with this kind of fracture is different and calls for the surgeon's ability and knowledge to restore the pre-traumatic facial architecture and attractiveness. Most patients with pan facial trauma may still have some residual deformity after undergoing rigorous treatment, necessitating additional surgery for rectification. This case report provides a brief overview of the management and basic techniques utilized to lessen and treat a 74-year-old man's pan facial trauma.

Keywords: Midface fracture, Nasal fracture, Open reduction and internal fixation, Pan facial Injury, Submental Intubation, panfacial fracture, facial trauma, sequencing repair, occlusion restoration

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INTRODUCTION

Treatment for panfacial injuries may initially appear challenging, but results can be maximized by following a methodical approach and comprehending the principles of restoration. A frequent fracture pattern is represented by a number of injury mechanisms that spread along the weak points in the mandible and midface. LeFort (Figure 1) provided a conventional description of standard fracture patterns; however, most fractures combine elements of both other and LeFort fractures.

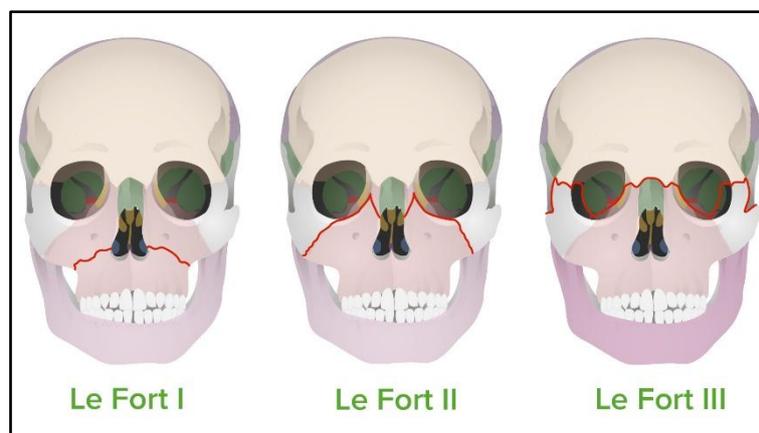


Figure 1. Standard Le Fort Fracture Patterns

Patients who survive auto accidents frequently sustain polytrauma from high-velocity collisions. They frequently exhibit combinations of fracture patterns that extend into the orbital and naso-ethmoid areas. The lower third, middle third, and top third of the face are the components of a true panfacial fracture; however, the midface and mandible should also be involved, as a true panfacial fracture would need [1]. Table 1 lists the elements of panfacial fractures. All of these different fracture types are typically present in combination.

Table 1. Structural components primarily involved in panfacial fracture

Upper third	Middle third	Lower third
Frontal bone	Orbit	Mandible
Fronto-orbital bandeau	Zygoma	
Sphenoid sinus	Ethmoid	
	Nose	
	Maxilla	
	Maxillary and mandibular alveolar ridge	

CASE REPORT

Clinical History: Patient is Mr Dhananjayan (74/Male) was reported to the casualty department of Sree Balaji Medical College and Hospital, Chromepet with a history of RTA (Two Wheeler vs Four Wheeler). No h/o vomiting, nausea, seizures were reported. One episode of nasal bleed- arrested by Department of ENT. Not a k/c/o Hypertension, Diabetes Mellitus, endocrine disorders, Bronchial Asthma, or Epilepsy. No known history of any deleterious habits was reported.

Clinical Features: On inspection, the patient was conscious, stable and well oriented to time, place and people. His mouth opening was restricted to ~ 25mm. On examination, step deformity was felt in the right parasymphysis region of the mandible, superior and inferior borders of the orbit and flattening of the left zygomatic arch was observed. There was segmental mobility in the right parasymphysis of the mandible region, as well as the maxilla. No palpable lymph nodes were present. Patient had tenderness on palpation over both the mandible-parasymphysis region, as well as maxilla. Intraorally, patient was found to be partially edentulous and his remaining dentition was attrited (Figure 2).



Figure 2. Clinical Features

Radiographic Features: CT facial bones revealed fractures in the right parasymphysis region of the mandible, Lefort II fracture on the right side, Lefort III fracture on the left side (Figure 3).



Figure 3. Radiographic Features

Intra-operative Procedure: GA was induced. Patient intubated. Skin prep was done with 5% Betadine solution. LA was infiltrated in the supraorbital region, over a pre-existing scar. An incision was made through the pre-existing scar to access the superior orbital margin. The fracture site was exposed. Fracture was reduced, and fixed using one 8-hole plate without gap, and 8(2×4mm) screws (Figure 4).

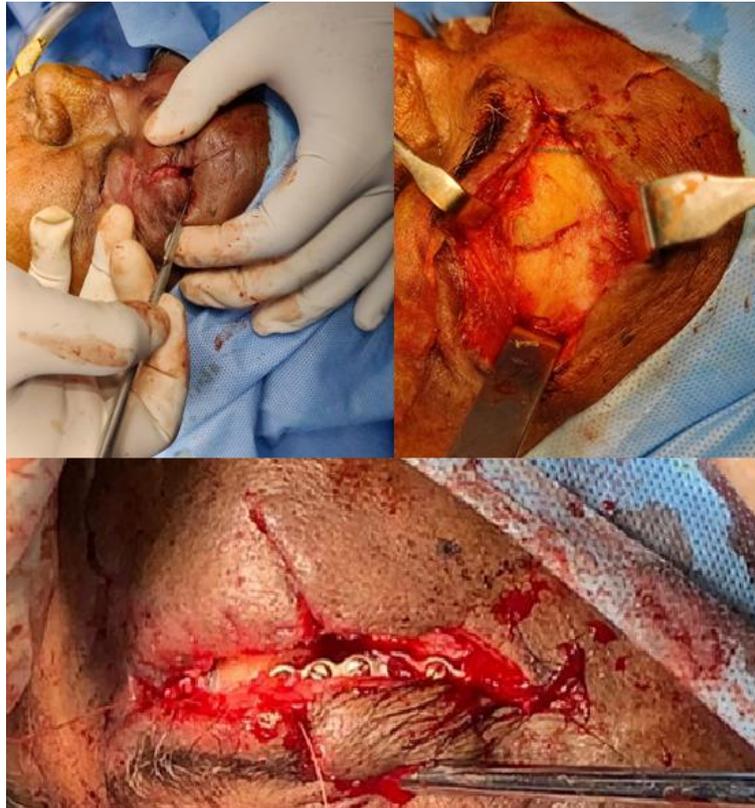


Figure 4. Intra-operative Procedure I

LA with adrenaline was infiltrated in the infraciliary region. An infraciliary incision was placed on the left side. The left zygomatic arch fracture was exposed through the infraciliary incision. The fracture was reduced and fixation was done using 1 4-hole plate with gap, and 4(2x6mm) screws (Figure 5).



Figure 5. Intra-operative Procedure II

The fracture in the inferior orbital margin was exposed. Fracture was reduced and fixation was done using one 2-hole plate with gap, and 2(2x6mm) screws (Figure 6).



Figure 5. Intra-operative Procedure III

Fixation of the LeFort II Fracture: A vestibular incision was placed, extending from 16-26 region. Mucoperiosteal flap was raised. The right side fracture site was exposed. The fracture was reduced. Fixation was done using L-plate with 4 holes, and 4(2x6mm) screws (Figure 6).

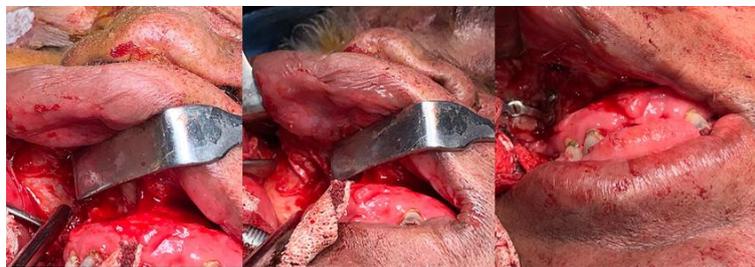


Figure 6. Fixation of the LeFort II Fracture

Fixation of the LeFort III Fracture: The fracture site was exposed on the left side. The fracture was reduced. Fixation was done using one 2-hole plate with gap, and 2(2x6mm) screws (Figure 7).



Figure 7. Fixation of the LeFort III Fracture

The Right Parasymphysis of the Mandible Fracture: A vestibular incision was placed in the mandible, extending from the 43-46 region. Mucoperiosteal flap was elevated. Fracture site was exposed. The fracture was reduced, and fixation was done using 2 6-hole plates with 12(2x8mm) screws (Figure 8).

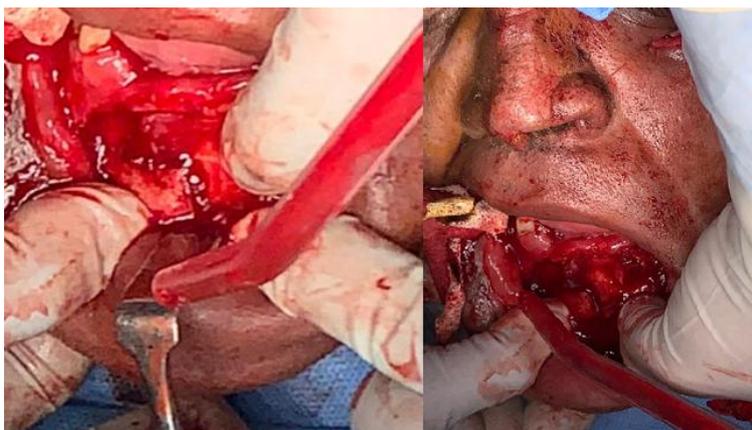


Figure 8. The Right Parasymphysis of the Mandible Fracture

Closure of incisions: Metrogyl wash was given in all the surgical sites. Extraoral incisions were closed in 3 layers using 3-0 Vicryl for the inner layers, and 4-0 Ethilon for the outer layer. Intraoral incisions were closed using 3-0 Vicryl (Figure 9).



Figure 9. Closure of incisions

Post-operative observation:

The Post-operative radiograph and photograph showed satisfactory healing in the patient.

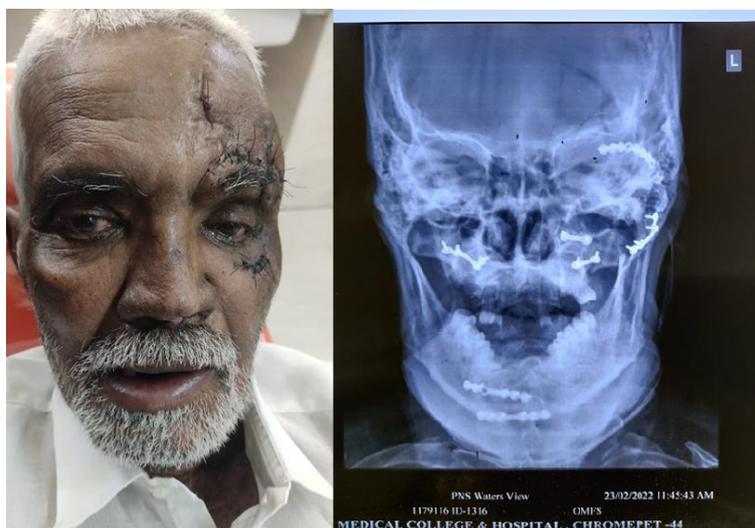


Figure 10. Post Operative radiograph

DISCUSSION

Pan facial fractures occur when the mandible, midface, and upper part of the skull are fractured at the same time [2]. Restoring preoperative functionality, anatomy, and three-dimensional facial features is the goal of treating these fractures [3]. It is important to treat these fractures with the goal of avoiding secondary postoperative deformity. The type of injury aids in determining the impact's most likely energy and the trauma's most likely extent [4]. Patients with pan-facial trauma may also have multisystem injuries as a result; hence, other specialists' opinions should be sought out throughout treatment. According to

Markowitz [5], frontal and palato-alveolar fractures are a component of widespread pan face trauma.

Facial fractures are typically bilateral when they originate from a motor accident causing maxillofacial injuries [6]. Intubating someone submental is a safe and simple procedure that doesn't require any specialized equipment. Furthermore, it doesn't go in the way of surgically attaining occlusion and treating the nasal complex fracture. Guidelines for Advanced Trauma Life Support (ATLS) should be followed while managing patients who have reported with pan-facial trauma. According to Robert Marciani, after the patient in this case study underwent a clinical examination, imaging methods were utilized to corroborate the diagnosis. Inappropriate aesthetics or postoperative deformity are avoided with early surgical intervention. The thicker horizontal and vertical buttresses that make up the face aid in transferring the energy of mastication to the base of the skull. Additionally, in the event of trauma, it absorbs the impact to prevent brain injury. The middle part of the face is structurally and functionally stable when the skeletal unit is properly oriented. Nasal projection in fractures involving the NOE complex requires careful consideration and time due to the major potential consequences it poses, such as saddle nose deformity, telecanthus, epiphora, etc. Treatment for panfacial fractures should be administered in the correct order. Panfacial fractures can be treated using one of two traditional methods: "Bottom up & Inside out" or "Top down & Outside in" [7]. Prior to diminishing NOE or the "Inner facial frame," Gruss and Phillips recommended reducing the zygomatic arch and malar projection [8]. According to Kreutziger's research, a "Intra oral maxillary buccal vestibular" incision was made in this instance, allowing for sufficient access to the maxillary antrum and zygomatic buttress [9]. As stated by Converse for the treatment of Nasoethmoidal fractures, an open sky incision was utilized in this instance to correct the nasal bone fracture. Surgeons cannot agree on how to treat facial fractures; several skin incisions and osteosynthesis techniques have been recommended. In this instance, local incisions were employed to stabilize and fix the

broken fragments because to the possible difficulties that could arise from a coronal incision, such as scar alopecia and sensory issues. The "Bottom up & inside out" approach was employed in this case as well, and Yang et al. reported satisfactory results after completing it [10]. This helped to stabilize the mandibular fracture. The maxilla was guaranteed to be in the correct position by achieving occlusion after maxillo-mandibular fixation. In order to rectify the transverse and antero-posterior dimensions of the face, the zygomatic complex was decreased and fixed on the right and left sides. According to Michelet, the inner face frame, or Naso-orbitoethmoidal complex, was stable, and fixing was carried out using mini-plates because of its effectiveness.

CONCLUSION

This case study demonstrates the ease of use and advantages of submental intubation as a helpful alternative method for treating panfacial fractures. When it comes to treating panfacial injuries, the method that moves from the known to the unknown is the more accurate of the two conventional techniques. In order to manage a case of pan facial trauma using either of the techniques, the maxillofacial surgeon must possess thorough anatomical knowledge and experience. In summary, panfacial fractures should be treated with a minimally invasive technique. After stabilizing the trauma patient, early surgical intervention to minimize and treat the fractures utilizing miniplate osteosynthesis produces good postoperative results. Before surgery, patients with complicated facial injuries should be made aware of the possibility that they will require more corrective surgery down the road. In addition to restoring the orbital, oral, and nasal cavities, the surgical approach to managing facial fractures should concentrate on achieving the correct occlusal, vertical, and horizontal relationships of the facial frame.

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