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Case Report

Dentistry Section

Surgical Approaches and Management of Panfacial Trauma: A Case Report

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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 Pan-facial fractures and managing these cases is extremely complicated. Proximity of the maxillofacial region to the important features or senses such as visual function (diplopia), olfaction, respiration (airway management), chewing or mastication (occlusion), deglutition and aesthetics; makes the scenario a little more complex for the surgeon operating in this particular region than the surgeon operating any other part of the body. Inability to directly visualize and reduce all the components of a pan facial injury along with inadequate stability of the fractured bones leads to persistent deformity.

It is challenging to follow an established pattern for repairing the pan facial fractures. Each case with this type of fracture is unique and requires skill and expertise of the surgeon to restore the pre-traumatic anatomy and facial aesthetics. Despite all the aggressive treatment, most of the patient's with pan facial trauma may have some residual deformity which may require another correction surgery later. 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.

Keywords: Midface fracture, Nasal fracture, Open reduction and internal fixation, Pan facial Injury, Submental Intubation

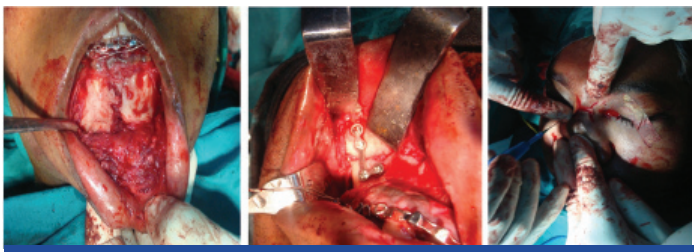
CASE REPORT

A 23-year-old male patient reported to a private hospital (Jammu August 2014) with history of road traffic accident [Table/Fig-1]. Patient had bilateral peri-orbital oedema (racoon eyes), sub-conjunctival ecchymosis, deranged malocclusion, dish face deformity, lengthening of the face. On clinical examination; there was no history of loss of consciousness and vomiting, but patient had bleeding from his nose. Patient was stabilised and thoroughly examined to rule out multisystem injury. Lip lacerations were sutured using local anaesthesia with adrenaline (1:80,000).

Clinical examination and radiographic analysis revealed multiple facial fractures. Step defects were palpated at mandibular parasymphysis region, Right zygomatic complex [Table/Fig-2]. Patient was advised for surgery and informed written consent was obtained. All routine blood investigations were done which were required for surgery under General Anaesthesia. Orotracheal or Nasotracheal intubation was not favourable as the patient had mandible fracture along with nasal bone fracture; which would require manipulation during surgery, so submental intubation was done which is an indication for these types of panfacial fractures [Table/Fig-3].

Patient underwent open reduction and internal fixation of the panfacial fractures using lower sublabial degloving incision [Table/Fig-4] for stabilising and fixing mandibular parasymphysis fracture, intra oral maxillary vestibular buccal sulcus incision in right [Table/Fig-5] and left side to stabilise and fix the zygomatic buttress. Modified Open sky approach was used to fix nasal bone fracture using miniplates

[Table/Fig-1]: Pre-op after initial stabilisation **[Table/Fig-2]:** Pre op 3D CT
[Table/Fig-3]: Submental intubation



[Table/Fig-4]: Degloving incision **[Table/Fig-5]:** Intra oral maxillary vestibular approach to fix right zygomatic buttress **[Table/Fig-6]:** Open sky incision

[Table/Fig-7]: Miniplate stabilising nasal bone fracture
[Table/Fig-8]: Sutures in situ

[Table/Fig-6]. First, symphysis fracture was reduced and stabilised using miniplates and screws. Rowe's disimpaction forceps were used to disimpact the maxilla and attain proper occlusion using Maxillo mandibular fixation. Then, intra oral vestibular sulcus incision was placed in right and left.

Zygomatic buttress region followed by miniplate fixation on both the sides. Lastly, an open sky incision was placed and connected transversely exposing the nasal bone fracture, after which fixation was done using miniplates [Table/Fig-7]. After placing miniplates incisions were closed in layers using 3-0 vicryl and 4-0 ethilon [Table/Fig-8].

Oral hygiene was maintained using Chlorhexidine 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.

DISCUSSION

Pan facial fractures are simultaneous fractures involving cranium (upper third), mid-face and the mandible [1]. Treating these fractures is aimed to restore the preoperative functions, anatomy and three dimensional facial contours [2]. Treatment of these fractures should be aimed at prevention of secondary Postoperative deformity. The mode of injury helps to identify the probable energy of the impact and the likely extent of trauma as well [3]. Pan-facial trauma patient subsequently may have multisystem injury as well, so the treatment should involve the opinion of other specialities also. Frontal and palato-alveolar fractures are part of extended pan facial trauma as stated by Markowitz [4].

It has been observed that when maxillofacial injury occurs as a result of Road traffic accident; facial fractures are mostly bilateral [5]. Submental intubation is safe and easy to execute without the need of any specialized equipments. Moreover; it doesn't interfere in achieving occlusion intraoperatively and fixing the nasal complex fracture. Patient reporting with pan-facial trauma should be managed according to Advanced Trauma Life Support (ATLS) guidelines. As stated by Robert Marciani; imaging techniques were used to confirm the diagnosis after clinically examining the patient in this case report. Early surgical intervention avoids postoperative deformity or unacceptable aesthetics. This patient was operated three days after the trauma which is advised to have better outcomes as reported by Nicholas Z. The face is made up of horizontal and vertical buttresses which are thicker and helps to transmit the forces of mastication to the skull base. It also absorbs the impact avoiding damage to the brain in case of trauma. Properly alligned skeletal unit gives structural and functional stability to the middle third of the face. Time and detailed attention should be given to Nasal projection in fractures involving NOE complex; as it has serious potential complications like saddle nose deformity, telecanthus, epiphora etc. Proper sequencing for treating panfacial fractures has been given. Two classic approaches for treating panfacial fractures are: "Bottom up & Inside out" or "Top down & outside in" [6].

Gruss and Phillips advised reduction of zygomatic arch and malar projection first to re-establish "Outer facial frame" before reducing NOE or "Inner facial frame" [7]. As stated in literature by Kreutziger "Intra oral maxillary buccal vestibular" incision was used in this case which provided adequate access to the zygomatic buttress and maxillary antrum [8]. Open sky incision was used in this case to fix nasal bone fracture as described by Converse for managing Nasoethmoidal fractures. 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 & inside out" sequence which was also used in this case and helped in stabilising the mandibular fracture [9]. 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. Inner facial frame or Naso-orbitoethmoidal complex was stable and fixation was done using mini-plates owing to their success as reported by Michelet.

CONCLUSION

This case report shows the simplicity of submental intubation and benefits of this useful alternative technique in managing the panfacial fractures. Out of the two classical approaches, an approach which goes from known to unknown is more accurate in managing panfacial injuries.

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. 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.

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