

Management of Neglected Facial Fracture: A Case Report

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Abstract:

Introduction: Neglected fracture occurs where there has been a delay of more than 30 days. The maxillofacial fracture complex is the most common fracture in traffic accidents. The most common maxillofacial fractures are Naso-Orbito-Etmoid (NOE), Lefort fracture, Zygomatic Complex (ZMC), Palate Fracture, and Parasymphysis Fracture. Neglected fractures lead to delayed treatment, worsening conditions, and even disability.

Case: A 52-year-old male patient presents with complaints of facial bone fracture after being involved in a motor vehicle accident. CT scan examination showed: Multiple fractures of the bilateral nasal bones, interethmoidal septum, anterior walls of bilateral frontal sinuses, bilateral lamina papyracea of the ethmoid bone, anterior, medial, and lateral walls of bilateral maxillary bones all support Le Fort II. fracture, extending to bilateral dentoalveolar processes, bilateral zygomatic bones, and right mandibular parasymphysis.

Case Management: The ORIF technique was used for the upper, middle, and lower face fractures in a preferred order. The palatal reduction and fixation step was frequently the first in this sequence. When proper occlusion was achieved, it was maintained by intermaxillary fixation.

Conclusion: There was a significant result in correcting the functional, mastication, and aesthetic of the mid and lower face by using surgical management of facial fractures using ORIF.

Keywords: Facial fracture, Neglected fracture, ORIF

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Introduction

Trauma is described as a tissue injury that occurs rapidly due to violence or an accident and is responsible for triggering the hypothalamic-pituitary-adrenal axis. These immunologic and metabolic responses restore homeostasis[1]. Trauma is the number one cause of death worldwide. The most prevalent causes of death among trauma sufferers are bleeding, cardiopulmonary

arrest, and multiple organ failure syndromes. The evaluation of trauma sufferers necessitates a structured and systematic approach[2]. An efficient and thorough trauma assessment reduces morbidity and mortality[2]. The Airway, Breathing, Circulation, Disability, and Exposure ("ABCDE") method is appropriate for all clinical situations that require prompt

assessment and treatment[3] Airway: Maintain the airway and employ an advanced airway if necessary. Confirm the installation of an advanced airway and secure the device. Breathing: Use a bag mask, augment with oxygen, and avoid excessive ventilation. The effectiveness of ventilation and oxygenation should also be assessed during this procedure. Circulation: Obtain IV access, attach ECG leads, identify and monitor arrhythmias, administer fluids if needed, and perform defibrillation if necessary. Disability: Conduct a general neurological assessment, including responsiveness, degree of consciousness, and pupil reflex. The AVPU acronym could help (Alert, voice, painful, and unresponsive). Exposure: Remove all garments to allow for a comprehensive visual inspection. This visual examination should look for evidence of trauma, blood, burns, and medical alert wristbands.

The Glasgow Coma Scale (GCS) objectively assesses the level of impaired consciousness in all acute medical and trauma patients. The scale rates patients based on three types of responsiveness: eye-opening, motor, and verbal responses[4]. The total score is supposed to reflect the severity of the injury, with scores of 3-8 suggesting severe injury, 9-12 indicating moderate injury, and 13-15 indicating light injury. Furthermore, GCS total scores of 3-8 are frequently used to diagnose coma[5]

Neglected maxillofacial fractures occur when facial bone structures are not adequately managed, leading to delayed therapy and tissue harm. Neglected fractures are more common in developing countries due to factors such as limited hospital facilities, remote locations, and patient refusal to receive care. Hospital staff's lack of awareness of maxillofacial disorders can

lead to misdiagnosis and delayed or incorrect treatment of facial bone fractures[6].

Le Fort injuries are complicated midface fractures named after Rene Le Fort, who analysed cadaver skulls that had been subjected to blunt force trauma. His investigations identified areas of structural weakness in the maxilla known as "lines of weakness" where fractures occurred. These fractures are categorised into three classes based on their direction: horizontal, pyramidal, and transverse. The pterygoid plate is implicated in every form of Le Fort fracture and may cause a pterygomaxillary separation. The lack of a pterygoid fracture rules out a Le Fort fracture[7]

Imaging is still one of the most essential diagnostic techniques for early diagnosis of these potentially fatal injuries[8]. Multidetector computed tomography is the preferred imaging test for patients with facial injuries because it can detect and describe even minor fractures and their accompanying problems rapidly and accurately[9]

Case

A 52-year-old male patient presented to Hasan Sadikin General Hospital OMFS emergency department with chief complaint of facial bone fracture. The patient had been in a motor vehicle accident two weeks prior to admission. The patient was previously known to have been riding a motorcycle at high speed. Subsequently, the patient attempted to avoid a pothole, causing him to lose his balance and fall with his head hitting the asphalt first. The patient was previously observed wearing a half-face helmet. He has a history of fainting for 5 minutes, along with bleeding from the mouth and nose; then, he was referred to Hasan Sadikin General Hospital OMFS emergency department.



Figure 1: The patient presented with asymmetrical face



Figure 2: Intra-oral condition showed altered occlusion

3D Head CT scan without contrast showed multiple fractures of the bilateral nasal bones, interethmoidal septum, anterior walls of bilateral frontal sinuses, bilateral lamina papyracea of the ethmoid bone, anterior, medial, and lateral walls of bilateral maxillary bones, maxilla extending to bilateral dentoalveolar processes, bilateral zygomatic bones, and right mandibular parasymphysis all support Le Fort II. Right-frontal pneumocephalus. Hematosinus is in the right frontal sinus, left sphenoid sinus, and bilateral ethmoid and maxillary

sinuses. Cephalic hematoma in the right parietal area. Based on clinical and 3D Head CT scan evaluation, the diagnosis was confirmed as fracture of the naso-orbito-ethmoidal complex type II, Le Fort II, fracture with Left-sided zygomaticomaxillary complex fracture (Tripod: zygomaticomaxillary, zygomaticosphenoid, zygomaticofrontal), palatal fracture type II, fracture of the right parasymphysis of the mandible, fracture in the dentoalveolar area involving teeth 42,43 (Fig. 3).

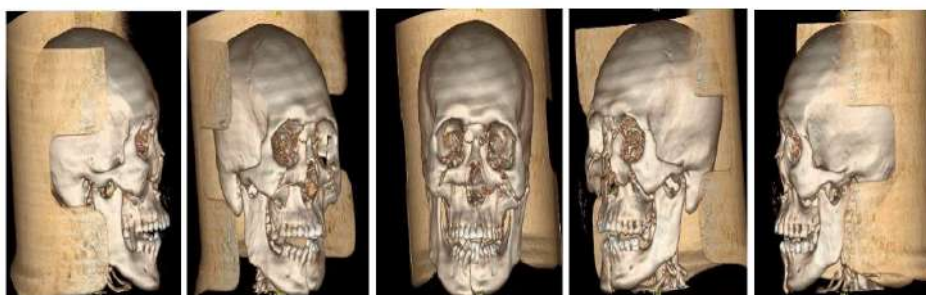


Figure 3: 3D Head CT scan without contrast

Case Management

ORIF was performed for the upper, middle, and lower face fractures in a preferred order (Fig 4). After the optimal occlusion was achieved, it was maintained by intermaxillary fixation. If there were any fractures in this unit, they were then treated on the upper face. This includes

treating fractures of the frontal sinus and supraorbital rim and roof. The next focus was on fixing and reducing any existing mandibular fractures. After developing an inferior and superior framework, the mid-face was restored¹²



Figure 4: ORIF to fixed the fractures

Patient then hospitalized and administered liquid diet with 2000 kcal/day. Wound was treated with gauze, and intermaxillary fixation was performed on POD I and was maintained until POD XXX. Several days

after the operation the patient showed improvement of his general status and the patient was discharged. The wound area showed good healing and proper occlusion was achieved (Fig 5).



Figure 5: Profile photo and occlusion of the patient after 30 days

Discussion

Le Fort injuries arise when the energy transmission to the body exceeds the damaged tissue's tolerance. Beware that these complex injuries rarely occur in isolation

and are frequently linked with concomitant or life-threatening injuries[7]. Le Fort fractures are classified into three anatomical levels: I, II, and III[10].

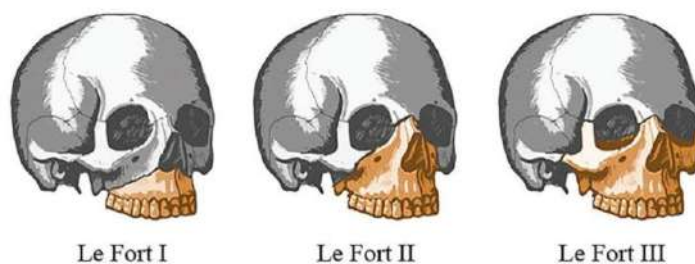


Figure 6: Le Fort Fractures Anatomical classification10

Le Fort I fractures are horizontal fractures of the front maxilla that occur above the palate and alveolus, extending through the lateral nasal wall and pterygoid plates. These fractures cause the tooth-bearing maxilla and hard palate to move away from

the midface and are linked to dental fractures and malocclusions[10]. Le Fort II fractures have a pyramidal shape and involve the zygomaticomaxillary suture, nasofrontal suture, the pterygoid process of the sphenoid, and frontal sinus. These

fractures damage the medial, lateral, upper transverse, and posterior maxillary buttresses, resulting in discontinuity of the inferomedial orbital rims. The involvement of the orbit in such fractures can result in consequences such as extra-ocular muscle injury, orbital haemorrhage, globe rupture or impingement, and optic nerve damage[10] Le Fort III fractures affect the nasal bones, medial, inferior, and lateral orbital walls, pterygoid processes, and zygomatic arches, completely separating the midface from the cranium. These fractures impact the medial, lateral, upper transverse, and posterior maxillary buttresses[10] The initial evaluation and stabilisation should be carried out in collaboration with a trauma surgeon. When dealing with life-threatening injuries, definitive surgery should be undertaken after stabilisation. Le Fort fractures necessitate the attachment of unstable fracture fragments to supportive structures[7]. The goals of fracture management are to restore the facial projection and affected sinus chambers, reestablish proper tooth occlusion; keep in mind that proper restoration is impossible without adequate occlusion, and restore the integrity of the nose and orbit[7] The primary purpose of Maxillary Lefort II fracture therapy is to establish occlusion, repair the vertical and horizontal buttresses to re-establish the midface structure and aesthetics, as well as the appearance regarding facial integrity, projection, height, and width[11]. The midface has two major facial buttresses: vertical and horizontal buttresses. The face has three vertical midface buttresses: nasomaxillary, zygomaticomaxillary, and pterygomaxillary. The horizontal midface buttresses of the face include the frontal bar, orbital rims, and maxillary alveolar. The treatment consisted of internal fixation with plates and screws of the buttresses; however, in order to bear functional vertical bite stresses on the buttresses, the plates must be sufficiently large[11]

The most common surgical method for Maxillary Lefort II Fracture is an intraoral route through an upper gingivobuccal

sulcus incision, which provides excellent exposure of the medial and lateral vertical buttresses. Lower eyelid incisions, such as subciliary or transconjunctival incisions, expose the horizontal buttress, known as the infraorbital rim. The frontozygomatic fracture located in the zygomaticomaxillary vertical buttress can be revealed via a peri-orbital or lateral eyebrow incision[11]

In a preferred order, the attending surgeons performed ORIF using typical surgical techniques for the upper, middle, and lower face fractures. The palatal reduction and fixation step was frequently the first in this sequence. Next, appropriate occlusion was achieved, and intermaxillary fixation maintained this connection. If there were any fractures in this unit, they were then treated on the upper face. This includes treating fractures of the frontal sinus and supra-orbital rim and roof. The next focus was on fixing and reducing any existing mandibular fractures. After developing an inferior and superior framework, the midface was restored[12]

Conclusion

A 52-year-old man presented to the emergency department due to a traffic accident. Based on prior evaluation performed, the diagnosis was confirmed as fracture of the naso-orbito-ethmoidal complex type II, Le Fort II, fracture with Left-sided zygomaticomaxillary complex fracture (Tripod: zygomaticomaxillary, zygomaticosphenoid, zygomaticofrontal), palatal fracture type II, fracture of the right parasymphysis of the mandible, fracture in the dentoalveolar area involving teeth 42, 43. ORIF was performed for the upper, middle, and lower face fractures in a preferred order. The palatal reduction and fixation step was frequently the first in this sequence. Next, after appropriate occlusion was achieved, this connection was maintained by intermaxillary fixation

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