

SURGICAL TREATMENT OF LE FORT I AND PALATAL FRACTURES: CASE REPORT

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ABSTRACT

Maxillary fractures are among the most severe, hardly isolated and generally associated with other types of fractures. They cause important changes in dental occlusion, mouth opening limitation, and aesthetic deformity, especially when there is a transverse fracture pattern. The aim of this paper is to report the surgical treatment of a female patient, 23 years old, male victim, physical aggression who presented with a diagnosis of maxillary fracture (Le Fort I fracture associated with Lannelongue fracture), with open reduction and stable internal fixation. The reduction and fixation of the transverse maxillary defect, followed by fixation of the maxillary canine and zygomatic pillars are sufficient to obtain a good result for the patient, restoring function and aesthetics.

KEYWORDS: Maxilla, treatment, trauma, Le Fort I, palatal

1. INTRODUCTION

Facial trauma is considered one of the most devastating aggressions present in trauma centers, due to emotional consequences, the possibility of deformity of the functional aesthetic unit, and the economic impact generated on the health system. Due to the large exposure of the face associated with little protection, this region becomes very affected in trauma¹.

In facial trauma, maxillary fractures are among the most severe, hardly isolated and generally associated with other types of fractures. In addition, they cause important changes in dental occlusion, especially when there is a transverse fracture pattern, which, if not properly treated, has the potential to evolve with more relevant aesthetic and functional sequelae^{2,3}.

Among the etiological factors in facial trauma, we highlight the automobile, motorcycle, sports, work-related accidents and physical aggressions. Epidemiological variation is a factor dependent on culture, environment and means of transport⁴.

Biomechanics, pathophysiology and fracture classifications are well described in the literature, as well as the current approach to fracture reduction and

fixation.

The most accepted classification of maxillary fractures is Rene Le Fort, where it determines three patterns. Le Fort I, also known as Guerin fracture, Le Fort II or pyramidal fracture and Le Fort III fractures that refer to a craniofacial bone disjunction, ie the separation between the skull and face bones. Among other variations, we find the transverse maxillary fracture that receives the Lannelongue nomenclature and Walther fracture, characterized by the association of the Le Fort I and Lannelongue fractures, dividing the maxilla into four segments^{5,6}, as described in this clinical case.

Diagnosis in patients with recent trauma becomes difficult due to edema, bruising, limited mouth opening, possible bleeding, aesthetic deformity and associated craniofacial injuries. It is essential in clinical examination to evaluate bone occlusion, crackling or mobility in the maxillary region, changes in occlusion, as well as lacerations in the palate region. Obtaining imaging exams is imperative in order to aid diagnosis and treatment planning⁷.

Among the imaging exams, computed tomography is considered the gold standard, as it offers the ability to evaluate facial fractures in more detail, being the best option for imaging diagnosis for patients with maxillofacial trauma. In the case of conventional radiographic examination, fractures should be documented from at least two different angles, as it has a two-dimensional limitation, and may choose Waters and Hirtz projections^{7,8}.

The treatment of maxillary fractures is performed through reduction and fixation, either through maxillomandibular blocks or stable internal fixation using miniplates and screws. Surgical treatment of maxillary fractures allows faster recovery of the patient, with less morbidity when properly performed⁹.

Taking into account the objectives of treatment of facial fractures, such as return of masticatory functions, rapid bone healing, restoration of swallowing and phonation, lower risk of infection and pseudarthrosis, and acceptable facial and occlusal aesthetic results, the objective of this study is to report the surgical treatment through a clinical case of maxillary fracture (Le Fort I fracture associated with Lannelongue

fracture), resulting from physical aggression and treated with open reduction and stable internal fixation.

2. CASE REPORT

A 23-year-old male patient with a physical aggression presented to the emergency room of the Maxillofacial Surgery and Traumatology service of the Federal University of Goiás Hospital of Clinic - HC / UFG, presenting dermaabrasive lesions on the face associated with edema and periorbital hematoma bilaterally, with occlusion of the eyelid rhymes, epistaxis, facial asymmetry, difficulty in opening the mouth, alteration of dental occlusion, loss of dental elements and mobility of the maxilla on digital palpation.

Initially facial abrasions were cleaned with saline (SF) 0.9%, alveolar sutures, bilateral nasal anterior tamponade with gauze soaked in 0.9% for epistaxis control and erich rods were installed mobilize the fractured segments. Imaging examination (computed tomography of the face) was requested, which revealed images suggestive of transverse maxilla fracture and Le Fort I type (Figures 1 and 2).

One week later, the patient underwent surgical treatment to reduce and fix maxillary fractures under general anesthesia, orotracheal intubation with submental shunt.

We performed intra and extraoral antisepsis with 10% topical PVPI, proceeding with maxillomandibular block. Maxillary vestibular fundus access, mucoperiosteal detachment and fracture traces exposures were performed.



Figures 1 and 2. Preoperative CT scan 3D reconstruction and axial section.

Initially, the transverse maxillary fracture was reduced and fixed using a 2.0 system plate at the lower edge of the piriform opening, followed by the reduction and fixation of the Le Fort I fracture in the maxillary and canine zygomatic abutments with 2.0 system plates (Figure 3).

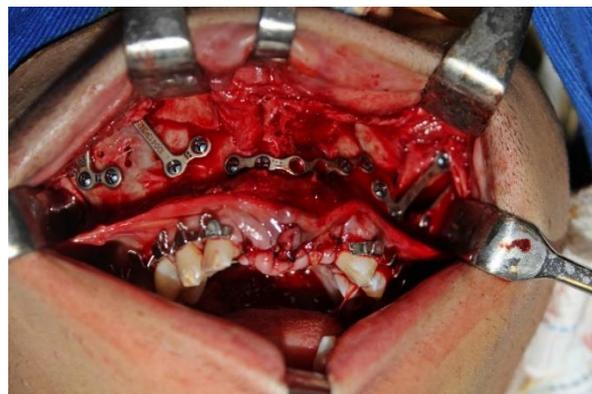


Figure 3. Intraoperative aspect reduction and fixation of fractures.

The maxillomandibular block was removed and occlusion checked. Sutures were performed with Vicryl 4-0.

Radiography performed in the immediate postoperative period showed a satisfactory reduction of facial fractures.

The patient was discharged 2 days postoperatively and prescribed cephalexin 500 mg for 7 days, dexamethasone 4 mg for 3 days and sodium diphyrone 500 mg in case of pain.

Twelve months after the outpatient follow-up, a

computed tomography was performed, showing osteosynthesis material in position and adequate bone regeneration (Figure 4). The patient does not report an aesthetic and / or functional complaint, presenting a removable partial denture replacing the missing dental elements and satisfactory dental occlusion.



Figure 4. Tomography - 3D one year postoperative

3. DISCUSSION

Maxillary fractures are predominantly male, having as their main etiology automobile accidents and physical aggression, corroborating what was demonstrated in the study. This fact is explained by the greater exposure of males to etiological factors, with the higher number of drivers compared to females, in addition to sports activities with greater physical contact^{10,11}.

Management of complex midface fractures requires a systemic approach, assessment of fracture fragment pattern, identification of stable craniofacial skeleton elements, and an integrated treatment plan mechanism. This requires proper categorization and classification of fractures.

René Le Fort (1901)⁵, in her original article, described the "great lines of weakness" of the facial skeleton when it is assaulted by a frontal direction at different levels. Le Fort type I fracture results from a force applied above the level of the teeth, running from the lateral edge of the piriform opening through the lateral antral wall, behind the maxillary tuberosity and through the pterygoid junction. The nasal septum may be. Le fort type II fracture results from a force delivered at the level of the nasal bones. The fracture lines run along the nasofrontal suture, through the tear bone, and through the infraorbital edge in the zygomaxillary suture region, then follow inferiorly and

distally following parallel courses along the slightly higher path than the Le fort type I fracture. The nasal bone can be dislocated. Le Fort type III fracture is caused by a force at the orbital level; the resulting fracture is craniofacial disjunction. The fracture line runs through the zygomatic-temporal and zygomatic-frontal sutures along the lateral orbital wall, through the inferior orbital fissure, and medially nasofrontal suture. The fracture ends at the pterygomaxillary fissure. In the case presented, the fracture lines run from the piriform region and run through the lateral antrum, in addition to the transverse fracture in the palatal region.

It is crucial for the oral and maxillofacial surgeon to know in detail the anatomy of the region and its application in the surgical technique, in order to properly expose the noble structures belonging to the face, without any damage to the vascular and nervous structures. Thus, fractures of the middle third represent a considerable challenge to traumatology, since it is a structure that maintains a close relationship with various facial structures and, due to severe forces, several sequelae and / or complications may occur.

The most critical part of the clinical examination of midface fracture is the assessment of patient occlusion. The sensation of malocclusion is a very useful diagnostic modality. The mobility of the maxilla with the head stabilized is another sign that evidences the Le Fort I fracture. It is also important to palpate, especially in the vicinity of the orbital edges, in order to verify the diminished infraorbital nerve sensation. Inspection of the oral and nasal mucosa is important to rule out palatal fractures and nasal septum bruises, respectively¹². In the case presented, this stage of the clinical examination was extremely important in identifying the palatal fracture.

Cooter(1989)⁹ describes that for an adequate treatment plan the use of diagnostic imaging means that complement the clinical examination is indispensable. Although clinical examination is crucial for the evaluation of facial fractures, on many occasions the use of radiographic and especially tomographic examinations is essential for the closure of a diagnosis. Frakes (2004)¹³ and Faria (1997)¹⁴ agreed that 1.0mm slice computed tomography (CT) should be performed in all patients with significant facial trauma. Ideally, this should be done at the time of initial head CT during trauma assessment. Radiographic evaluation should include all structures from the lower edge of the mandible to the upper aspect of the frontal sinus.

Even with all the care and selection of the most indicated surgical technique, some complications are mentioned. Authors such as Manson (1986)⁷ and Manson (1999)¹⁵ report that complications of untreated middle third fractures often result in maxillary retrognathism, occlusal plane alteration, open and / or crossbite, and in more complex cases facial deformities and asymmetries. As a consequence, it will be impossible to return stable and functional occlusion to

the patient, besides the aesthetic disadvantage. In the impossibility of early surgical treatment, there is an increased risk of infection in the region due to micro movements of the segments. The time elapsed from the fracture is of fundamental importance in indicating the best treatment, where fractures older than 21 days may present difficulties at the time of reduction and fractures older than 30 days are treated as sequelae. In these cases, an osteotomy Le Fort I is the method of choice for correcting the retracted maxillar.

Farmand (1991)¹⁶ describes that treatment in maxillary fractures has as its primary objective the reduction, stabilization and fixation of unstable segments, restoring maxillomandibular anatomical relationships, vertical dimension and projection of the face, as well as restoring pre-trauma occlusion and restoring masticatory function. Stable plate and screw fixations for patients with extensive or multiple fractures provide the necessary stability for proper patient recovery, achieving the goals set out in the preoperative planning. Maintaining maxillomandibular block may be justified in cases of very dislocated fractures. In the reported case, it was decided to fixation one plate in the inferior border of the piriform opening, because we understand that the other option of fixation in the palate generates greater morbidity to the patient. In the fixation of Le Fort I, we performed the fixation of the zygomaticomaxillary and canine pillars, bilaterally.

4. CONCLUSION

Although less common, Le Fort I fractures associated with Lanelongue may occur. Accurate diagnosis of face fractures is critical for restoration of function and satisfactory facial aesthetics. As a form of treatment, it is necessary to recommend reduction and fixation of the transverse defect of the maxilla, followed by fixation of the maxillary canine and zygomatic pillars are sufficient to obtain a good result for the patient with this fracture pattern.

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