

Review Article

Le Fort Fractures: A Narrative Review of Diagnosis and Management

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ABSTRACT

Le Fort fractures represent complex midfacial fractures typically resulting from high-velocity trauma, characterized by the separation of the maxillary structure from the cranial base. This narrative review synthesizes contemporary literature regarding the etiopathogenesis, classification, diagnosis, and management of these fractures. Diagnosis requires a comprehensive clinical assessment supplemented by non-contrast computed tomography (CT) as the gold standard for delineating fracture patterns and buttress involvement. The review discusses the clinical relevance of classical Le Fort classifications alongside Wassmund and Marciani modifications to guide surgical planning. Management strategies prioritize initial stabilization according to Advanced Trauma Life Support (ATLS) principles, particularly airway control, followed by definitive surgical intervention. Open reduction and internal fixation (ORIF) remains the primary surgical modality, focusing on the restoration of vertical and horizontal buttresses, occlusion, and orbital integrity. Postoperative care is critical for preventing complications such as infection, malunion, and ocular dysfunction. Ultimately, successful management necessitates a multidisciplinary approach combining precise imaging and rigid fixation to restore facial aesthetics and function while minimizing long-term morbidity.

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1. INTRODUCTION

Le Fort fractures represent a classic pattern of midfacial fractures characterized by the discontinuity of the maxillary/midface segment from the skull base following high-force blunt trauma. Fundamentally, these fractures involve trajectories through the maxillary wall, orbital floor, and, most notably, the pterygoid plates of the sphenoid bone.¹ The classification distinguishes between Le Fort I (a low horizontal fracture separating the upper alveolar ridge and palate from the midface), Le Fort II (a pyramidal fracture involving the nasofrontal and inferomedial orbital regions), and Le Fort III (complete craniofacial disjunction separating the entire midface complex from the cranium).²⁻⁴

Le Fort fractures do not always present as "pure" patterns (symmetrical type I/II/III); they frequently manifest as asymmetrical presentations or a combination of multiple fracture levels.⁵ These fractures are often associated with head injuries and airway compromise, thereby necessitating a multidisciplinary trauma assessment (involving trauma surgery, oral and maxillofacial surgery, anesthesiology, and neurosurgery), as well as reconstructive surgical planning based on the fracture level and patient condition. Epidemiological data from international sources, the Asian region, and Indonesian national records indicate that Le Fort fractures are relatively rare compared to nasal or mandibular fractures.⁶

A 2025 international report on the distribution of facial fractures recorded Le Fort II patterns at 17.2%, Le Fort I at 15.4%, and Le Fort III at 14.8% of all midfacial fractures.⁷ However, large longitudinal studies indicate that the majority of facial fractures are not Le Fort type. Specifically, Le Fort I accounts for 0.4%, Le Fort II for 0.9%, and Le Fort III for 0.5% of cases.⁸ A study conducted in Bandung, Indonesia, between 2015 and 2020 identified 157 cases of maxillary fractures out of 1,221 maxillofacial trauma cases, although the specific proportions of Le Fort types were not detailed.⁶

This article aims to discuss the diagnosis and management of patients with Le Fort fractures.

2. METHODS

This study was designed as a narrative literature review. An electronic search of the medical literature was performed using PubMed, Scopus, and Google Scholar to identify relevant articles on Le Fort fractures and midfacial trauma. The search covered publications from January 2000 to June 2025.

The following key terms and their combinations were used, employing Boolean operators (AND, OR): "*Le Fort fractures*", "*LeFort fractures*", "*midfacial fractures*", "*midfacial fractures*", "*maxillofacial trauma*", "*panfacial fractures*", "*orbital fracture*", and "*orbital reconstruction*", combined with "*management*", "*treatment*", "*fixation*", "*open reduction and internal fixation*", and "*reconstruction*". Reference lists of selected articles and relevant textbooks in oral and maxillofacial surgery were also hand-searched to identify additional pertinent publications.

We included peer-reviewed articles that:

1. Focused primarily on Le Fort fractures or midfacial fractures in human subjects;
2. Reported on epidemiology, clinical features, diagnostic modalities, management, or outcomes of Le Fort fractures;
3. Were published in English; and
4. Were original clinical studies (prospective or retrospective), case series, review articles, clinical guidelines, or key textbook chapters.

We excluded experimental animal studies, purely technical radiologic reports without clinical correlation, isolated single case reports without broader discussion, conference abstracts without full text, and non-English articles for which a full-text translation was not available.

Given the narrative nature of this review, no formal protocol was registered and no quantitative meta-analysis or formal risk-of-bias assessment was performed; instead, evidence from the included sources was synthesized qualitatively according to major themes (etiology, clinical presentation, diagnostic work-up, operative and non-operative management, and postoperative care).

3. ETIOPATHOGENESIS

Le Fort fractures are frequently associated with high-velocity impact mechanisms resulting from acceleration-deceleration forces. Falls with direct impact to the face have been reported as causes for Le Fort I fractures, as well as for Le Fort II and III fractures.³ High-velocity trauma mechanisms and falls from heights greater than one story are common causes of Le Fort II and III fractures. Le Fort III fractures are also frequently accompanied by head and neck injuries, particularly traumatic brain injury (TBI), cervical spine injury, and skull fractures.^{9, 10}

The human facial skeleton is constructed by a system of pillars or "buttresses," both vertical and horizontal, which function to bear loads and withstand trauma.³ The primary vertical pillars include the nasomaxillary, zygomaticomaxillary, and pterygomaxillary buttresses. The fracture patterns in Le Fort injuries involve the disruption of the pterygoid plates of the sphenoid and one or more of these buttresses, causing the midface skeleton to lose its structural support and separate from the cranium.⁵

Horizontal buttresses (e.g., the palatal floor, maxillary alveolar arch, orbital rims, and zygomatic arch) work in conjunction with vertical buttresses to withstand blunt forces. When the external impact force exceeds the threshold strength of the bone and sutural connections, fractures occur. Le Fort fractures are typically the result of high-energy blunt trauma, such as motor vehicle accidents (particularly at high speeds), falls from heights, or severe impacts to the midface, nasal bridge, or upper maxilla.⁵

Midface bone structures possess areas of *locus minoris resistentiae* (points of structural weakness), such as the pterygoid plates, maxillary sinus floor, orbital floor, naso-orbital area, and the sutural connections between the maxilla, zygoma, and nasofrontal region.⁵ These are the points most susceptible to the propagation of fracture lines when external force is applied. This forms the basis of the "Le Fort lines" theory. However, contemporary literature emphasizes that anatomical variability among

patients and variations in trauma vectors result in many midfacial fractures that do not strictly conform to the classic Le Fort lines.⁹

4. CLINICAL MANIFESTATIONS

Patients with all types of Le Fort fractures frequently present with edema (swelling) and hematoma/ecchymosis of the face, particularly in the midface (maxilla, cheeks, and periorbital area) due to soft tissue and osseous injury.¹¹ Dental occlusion abnormalities (malocclusion), such as anterior open bite or discrepancies in the maxillo-mandibular relationship, are highly common as the maxilla (or facial skeletal segment) suffers instability, potentially leading to a "floating maxilla."¹² Pathological mobility of the maxilla/midface is detectable upon palpation; the upper face (maxilla, upper dentition, or palate) may move abnormally relative to the cranium. Crepitus (a grating sound) may be found if the fracture is displaced. Sensory disturbances (paresthesia or hypoesthesia) in the distribution of the infraorbital nerve (cheek skin, upper gingiva, and upper lip) may occur due to nerve trauma.^{5, 13} The three classical Le Fort fracture patterns and their relationship to the maxillary buttresses are schematically illustrated in **Figure 1**.

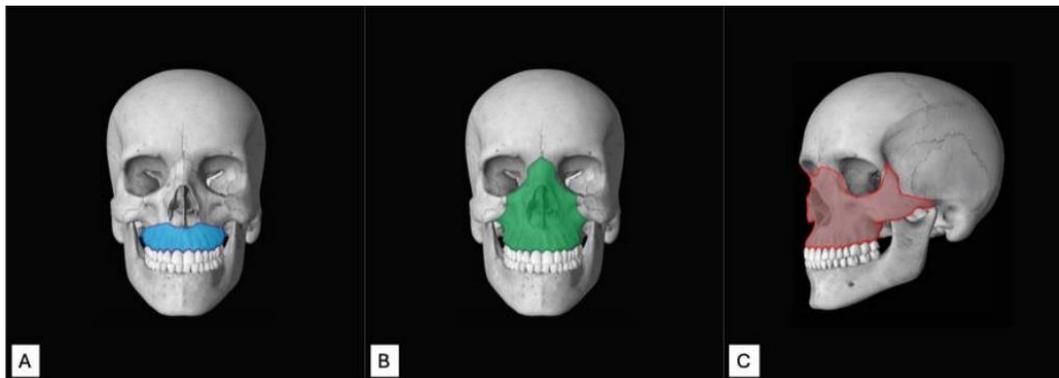


Figure 1. Three-dimensional schematic representation of Le Fort fracture patterns. (A) Le Fort I (horizontal) fracture involving the maxilla above the apices of the teeth (blue). (B) Le Fort II (pyramidal) fracture extending through the nasal bridge, medial orbital walls, and maxilla (green). (C) Le Fort III (craniofacial disjunction) fracture separating the midface from the cranial base, involving the zygomatic arches and lateral orbital walls (red).¹

Le Fort I fractures

Le Fort I fractures involve a horizontal disjunction of the maxilla from the upper facial structures. Clinically, patients often present with upper lip swelling, tenderness along the fracture line, and intraoral mucosal bleeding, such as hematoma in the vestibule. Malocclusion with an anterior open bite is a hallmark finding, particularly if the alveolar segment is displaced posteriorly or inferiorly. Intraoral examination may reveal palatal mucosal tears or mobility of the alveolar segment, presenting as a "floating maxilla." If the fracture is displaced, anterior movement of the maxilla may produce a sensation of friction between fragments.¹¹

Le Fort II fractures

Le Fort II fractures exhibit a pyramidal pattern, making the midface deformity more pronounced. Patients frequently experience bilateral periorbital edema and ecchymosis, producing the characteristic "raccoon eyes" appearance. Due to the involvement of nasal and infraorbital structures, bilateral epistaxis is common. In specific cases, cerebrospinal fluid (CSF) rhinorrhea may occur if the fracture extends to the anterior skull base. Midface mobility involving the maxilla and the naso-orbital-nasal complex is palpable. Additionally, infraorbital hypoesthesia is more frequent compared to Type I due to the higher level of the fracture.⁵

Le Fort III fractures

Le Fort III fractures represent the most severe form, known as craniofacial disjunction, as the midface is detached from the cranial base. Clinically, the deformity is dramatic, characterized by facial elongation ("dish-face" deformity), midfacial flattening, and edema severe enough to completely close the eyelids. Extensive subconjunctival hemorrhage, enophthalmos, diplopia, and restriction of extraocular movements occur if the orbit is involved. Damage to Lockwood's suspensory ligament can cause ptosis of the upper eyelid. This type poses the highest risk of airway compromise, as the posterior displacement of the palate can compress the tongue.^{5, 14}

For clarity, the key similarities and differences between the Le Fort (Wassmund modification) and Marciani (1993) classification systems are presented in **Table 1**.

Table 1. Comparison of Le Fort (Wassmund Modification) and Marciani (1993) Classification Systems ⁵

System	Type	Description
Le Fort (Wassmund Mod.)	I	Low maxillary fracture; occurs at the alveolar process and the pyramidal base of the nose, causing separation of the maxilla from the upper facial skeleton.
	II	Pyramidal fracture; fracture lines traverse the medial orbital wall, nasal bones, and maxilla, forming a pyramidal pattern.
	III	Craniofacial disjunction; total separation of the facial structures from the cranial base, involving the orbits extensively.
	IV	Skull base fracture associated with a Le Fort II or III fracture, indicating more severe damage extending to the anterior cranial fossa.
Marciani (1993)	Ia	Comminuted low maxillary fracture; similar to Le Fort I but involves multiple fragments.
	Ila	Pyramidal fracture with nasal fracture; combined damage to

System	Type	Description
		the maxilla and nasal bones.
	IIb	Pyramidal fracture with naso-orbito-ethmoid (NOE) fracture
	IIIa	Craniofacial disjunction with nasal fracture.
	IIIb	Craniofacial disjunction with NOE fracture.
	IVa	Supraorbital rim fracture.
	IVb	Supraorbital rim fracture with anterior cranial fossa fracture.
	IVc	Orbital wall fracture with anterior cranial fossa fracture.

5. DIAGNOSTIC EVALUATION

The diagnosis of Le Fort fractures commences with an initial evaluation adhering to the ABCDE principles of trauma management, prioritizing the stabilization of the Airway, Breathing, and Circulation. Severe facial injuries, particularly Le Fort types II and III, have the potential to cause airway obstruction due to maxillary displacement or massive hemorrhage.¹⁵ Patient stabilization is the primary imperative before proceeding with further examination. Once vital parameters are controlled, a focused facial examination is conducted to assess for deformity, edema, or clinical signs suggestive of midfacial fractures.¹⁶

A detailed injury-specific history is obtained to understand the mechanism of trauma and the potential structural damage involved. Information may be elicited from the patient, family members, or pre-hospital personnel. Critical inquiries include visual disturbances, hearing loss, facial hypoesthesia or anesthesia, a history of hemorrhage or clear fluid discharge (suggestive of CSF) from the nose, ears, or mouth, and difficulty breathing following the injury. These complaints assist in assessing the involvement of the orbit, infraorbital nerve, skull base, and pharyngeal structures, which are crucial elements in differentiating Le Fort fracture types and determining the need for immediate imaging.¹⁵

Physical examination is conducted systematically to identify hallmark signs of Le Fort fractures, including midface deformity, abnormal maxillary mobility, crepitus, epistaxis, malocclusion, and periorbital edema or hematoma. Palpation along fracture lines (infraorbital rim, nasal bridge, and zygomatic buttress) aids in identifying step deformities, which distinguish Le Fort II from Le Fort III.¹⁵ Facial neurological examination is essential to evaluate the function of the infraorbital and facial nerves. Examination of the oral cavity and dental occlusion is also performed to assess for a "floating maxilla" in cases of suspected complex fractures.¹⁶

Plain radiography may serve as an initial screening tool, particularly in resource-limited settings. Occipitontal (10–30°) and Waters (37°) projections are utilized to assess the paranasal sinuses and orbital walls. Interpretation involves the assessment of the McGregor–Campbell, Dolan, and Rogers lines, which assist in detecting disruptions in facial bone continuity. The "4 S" principle (**S**ymmetry, **S**harpness, **S**inuses/Beasts, and **S**oft tissues) proposed by DelBalso, Hall, and Margaroni is used to compare the injured side with the normal side. This allows for the early identification of bone contour abnormalities, although sensitivity is lower compared to computed tomography (CT).^{17, 18} Typical radiographic and computed tomography findings of a Le Fort II fracture on Waters and coronal views are shown in **Figure 2**.

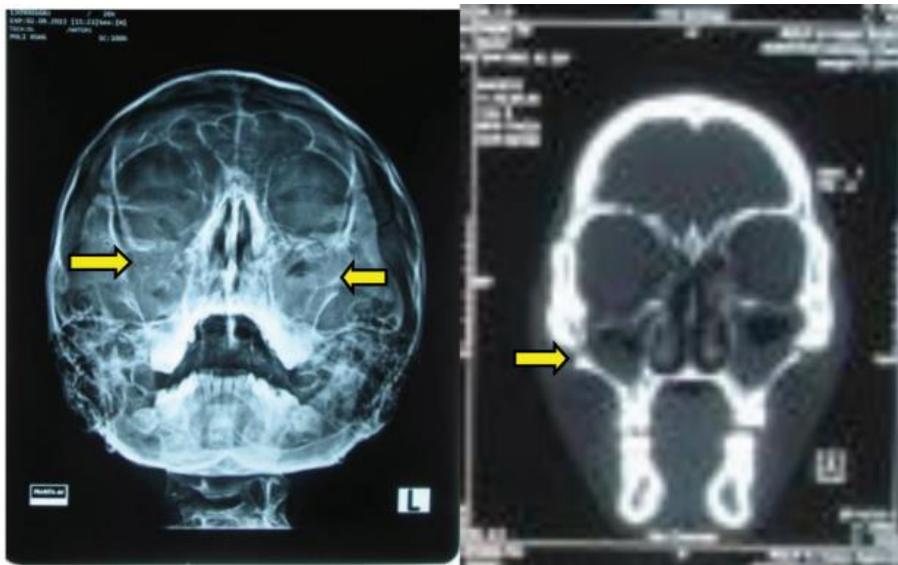


Figure 2. Imaging findings of a Le Fort II fracture. (A) Waters view radiograph demonstrating bilateral fracture lines of the zygomaticomaxillary buttresses (yellow arrows). (B) Coronal CT image showing fracture fragments along the orbital floor and maxillary sinus walls (yellow arrow).¹⁹

Non-contrast CT represents the gold standard for establishing the diagnosis of Le Fort fractures. The scan is performed in three planes (axial, coronal, and sagittal) and supplemented with 3D reconstruction to clearly visualize fracture patterns.¹⁸ CT imaging not only delineates the location and degree of osseous displacement but also facilitates the assessment of orbital, sinus, and skull base involvement, as well as the detection of complex fractures that may not be apparent on plain radiography. This information is critical for determining the management plan and restoring pre-traumatic anatomical relationships.¹⁷

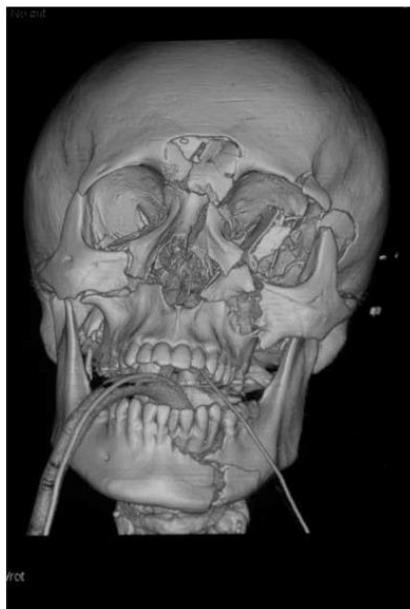


Figure 3. Three-dimensional computed tomography (3D CT) reconstruction of the midface demonstrating Le Fort fracture lines and disruption of the maxillary buttresses .¹³

6. MANAGEMENT

The management of Le Fort fractures necessitates a multidisciplinary approach, as these injuries involve the midfacial complex and are frequently accompanied by traumatic brain injury, cervical spine injury, and airway compromise. Treatment must adhere to Advanced Trauma Life Support (ATLS) principles, prioritizing airway maintenance, patient stabilization, and the identification of life-threatening injuries prior to specific facial interventions.^{9, 12}

1. Non-operative Management

Non-operative management is generally reserved for non-displaced Le Fort fractures that do not disrupt occlusion, do not cause midfacial instability, and exhibit no significant sinus or orbital cavity involvement.¹² This conservative approach typically encompasses analgesics, prophylactic antibiotics, hemorrhage control, immobilization, and a soft diet. Patient education is critical, specifically regarding the avoidance of activities that increase intranasal pressure, such as forceful nose blowing, inflating cheeks, or diving. Signs of sinus infection, secondary malocclusion, or changes in facial contour that may necessitate future surgical intervention require rigorous monitoring.¹¹

2. Operative Management

Surgical intervention is indicated in the presence of facial instability, occlusal discrepancies, aesthetic deformity, significant diplopia, orbital involvement, or widely displaced fractures. Le Fort II and III fractures almost invariably require surgery, as they involve midfacial structural supports essential for respiratory function, articulation, and facial aesthetics. Surgery should be

planned once soft tissue swelling has subsided, typically 5–10 days post-trauma, unless emergency indications exist, such as massive hemorrhage, herniation of orbital contents into the maxillary sinus, or airway compromise.²⁰

a. Open Reduction and Internal Fixation (ORIF)

Open Reduction and Internal Fixation (ORIF) represents the gold standard in Le Fort fracture management due to its ability to restore facial skeletal continuity and maintain long-term stability via rigid titanium fixation systems. This procedure targets the reconstruction of facial buttresses, which serve biomechanically as the primary support for the midface. The selection of the surgical approach is heavily dictated by the fracture pattern; intraoral approaches are commonly utilized for Le Fort I, while subciliary, transconjunctival, or coronal approaches are required for Le Fort II and III fractures to provide optimal access to the orbital and forehead complexes. Plates measuring 1.5–2.0 mm are typically selected based on bone thickness and the load-bearing requirements of the region.²⁰

The fundamental principle of ORIF is based on stepwise reconstruction utilizing "bottom-up" (commencing from the maxilla superiorly) and "inside-out" (proceeding from internal facial structures laterally) concepts. This technique ensures that the restoration of occlusion serves as the foundation before correcting other facial structures. Maxillary repositioning is performed using the physiological bite relationship as a stable reference point, followed by the stabilization of the facial pillars (nasomaxillary and zygomaticomaxillary), piriform, and lateral buttresses using miniplates. Buttress reconstruction is paramount, as these pillars determine facial projection, midface contour, and the ability of the sinuses to maintain their normal configuration.²⁰

In Le Fort I cases, the surgical focus is on returning the maxilla to its normal anatomical position and applying rigid fixation to the piriform and zygomaticomaxillary buttresses. Patients with Le Fort II fractures involving pyramidal patterns may undergo more complex reconstruction encompassing the nasofrontal and infraorbital areas. Fixation is typically applied to the infraorbital rim, nasomaxillary buttress, and zygomatic buttress. In Le Fort III patients, fixation must be applied to superior structures such as the nasofrontal junction, superior orbital rim, and zygomatic arch to restore craniofacial stability. Reconstruction in severe cases must be performed simultaneously to preserve function and aesthetics, as the resulting midface deformity can be significant.²⁰

b. Maxillomandibular Fixation (MMF)

Maxillomandibular Fixation (MMF) is a critical method for linking the maxilla and mandible, allowing the surgeon to assess and restore correct occlusion prior to plate fixation. This procedure can be achieved using interdental wiring, arch bars, self-tapping screws, or modern elastic systems.²¹ MMF serves as a vital anatomical reference because the dentition provides the most stable orientation for determining the pre-traumatic maxillary position. In many Le Fort II and III cases, this process is the initial surgical step to prevent occlusal misinterpretation caused by high maxillary mobility.²⁰

The duration of MMF varies by case. Patients with stable fractures following ORIF may undergo MMF release immediately on the operating table. Conversely, MMF may be maintained for 1–2 weeks in patients with comminuted fractures or when fixation plates are insufficient to withstand masticatory loads. Long-term use must be approached with caution due to risks of aspiration, difficulty maintaining oral hygiene, and potential nutritional compromise. Alternative techniques, such as guiding elastics, are preferred over rigid fixation in patients with a history of seizures, impaired consciousness, or pulmonary disease.²¹

c. Maxillary Repositioning and Occlusal Restoration

Maxillary repositioning is the core of reconstruction, as the maxillo-mandibular relationship determines masticatory function, lower facial aesthetics, and palatal structure. Minor errors in repositioning can lead to long-term complications such as crossbite, anterior open bite, or midface retroposition, which can significantly alter the facial profile. Therefore, surgery must ensure that the maxilla is placed in the correct three-dimensional position: anteroposteriorly, vertically, and transversely.²⁰

Modern repositioning techniques utilize various auxiliary devices, such as palatal splints to stabilize the palate, the use of teeth as occlusal reference anchors, and intraoperative navigation systems that enhance surgical precision.^{19,21} Virtual Surgical Planning (VSP) is widely used in the modern era. VSP allows for digital fracture analysis, prediction of postoperative anatomy, and the fabrication of patient-specific plates, which can reduce operative time and improve fixation accuracy. This approach represents one of the most influential innovations in complex facial fracture reconstruction.²²

d. Orbital Reconstruction

The orbital complex in Le Fort II and III fractures frequently sustains damage to the floor, medial wall, and orbital rims. Orbital reconstruction is indicated in cases of enophthalmos, persistent diplopia, extraocular muscle entrapment, or orbital wall defects causing volume loss. Modern implants, such as titanium mesh, porous polyethylene (Medpor), or a combination of both, are used to bridge and stabilize defects. Implant selection is tailored to defect size, fracture location, and long-term stability requirements.^{20, 23}

Orbital reconstruction procedures require extreme precision. Risks of optic nerve injury, retrobulbar hemorrhage, and ocular motility disturbances demand operator expertise and the use of visualization techniques such as transnasal endoscopy or intraoperative navigation technology. Implants must conform to the normal orbital contour; minimal errors can result in diplopia, proptosis, or globe malposition requiring revision.²⁰

e. Nasofrontal Junction Reconstruction

Injury to the nasofrontal junction is common in Le Fort II and III fractures as fracture lines traverse the nasal bones and nasal base. This area is critical as it serves as a central aesthetic landmark and the drainage portal for the frontal sinus. Without proper reconstruction, patients may develop "saddle nose" deformities, recurrent epistaxis, nasal obstruction, and long-term structural damage. Techniques include rigid fixation using titanium

miniplates or microplates at the convergence of the nasofrontal bone and nasal socket.²⁰

Further interventions, such as sinus obliteration and reconstruction of the anterior or posterior sinus walls, are necessary if the frontal sinus sustains severe damage. This is performed to prevent complications such as mucocoeles, osteomyelitis, or recurrent infections. A combination of coronal and endoscopic sinus approaches is utilized to ensure optimal reconstruction results while minimizing external scarring.²⁰

f. Coronal Approach and Zygoma Repositioning

The coronal approach provides comprehensive access to the frontal, superior orbital, and zygomatic arch regions. This is particularly useful in Le Fort III or Panfacial fracture cases. The incision is placed behind the hairline to camouflage scarring. This technique allows for extensive exploration and precise repositioning of the zygoma, particularly when it has undergone rotation or translation due to trauma. Coronal access also facilitates safer reconstruction of the superior orbit and frontal wall.²⁰

Zygoma repositioning is performed with specific manipulation instruments, such as periosteal elevators or zygomatic elevators (e.g., Rowe's or Gillies'), to return the bone to its correct three-dimensional position. Fixation is then applied at strategic points such as the zygomaticofrontal suture, infraorbital rim, and zygomatic arch. Lateral midface stability is crucial because the zygoma determines facial width, lateral contour, and masticatory function. Repositioning errors can result in conspicuous facial asymmetry.²⁰

g. Soft Tissue Management

Soft tissue management of the face requires an atraumatic approach, as the face contains numerous aesthetic landmarks that must be preserved. Lip lacerations must be reconstructed with attention to the vermilion border and muscular continuity. Nasal injuries require layered reconstruction to restore the alar and dorsal contours. In the eyelids, mismanagement can lead to functional issues such as ectropion or entropion. Debridement is performed only on clearly necrotic tissue, while viable tissue must be preserved to minimize deformity. The ultimate goal of soft tissue management is to maintain protective function, prevent infection, and preserve harmonious facial aesthetics.²⁰

3. Postoperative Care

Patients require intensive monitoring during the initial 24–48 hours to detect early complications following reconstructive procedures. The primary concern is infection, particularly maxillary or ethmoid sinusitis resulting from sinus involvement in the fracture lines. Broad-spectrum prophylactic antibiotics are recommended in the early phase to mitigate the risk of sinus infection or infection at the plate fixation sites. Patients are monitored for signs of secondary malocclusion, such as anterior open bite, occlusal deviation, or temporomandibular pain. Changes in facial contour, including midface retraction, asymmetry, or orbital depression, are evaluated periodically as these may indicate fixation failure or malunion.²⁴

Postoperative ophthalmologic evaluation is critical, particularly in Le Fort II and III cases involving the orbit. Assessments for new-onset diplopia, enophthalmos, ocular motility disturbances, or decreased visual acuity should be conducted during recovery. Postoperative visual changes may be indicative of retrobulbar hematoma, extraocular muscle spasm, or orbital implant malposition. Respiratory complications and airway edema warrant vigilant monitoring, as midface surgery may exacerbate nasal obstruction or compromise upper airway patency.

A soft diet is prescribed for the first 2–4 weeks postoperatively to reduce the masticatory load on the maxilla and prevent excessive stress on the fixation plates. In patients undergoing MMF for 1–2 weeks, the adequacy of daily liquid nutrition intake is a critical aspect requiring evaluation. Pain management is primarily achieved using non-opioid analgesics, while opioids are reserved for short-term management of severe pain. Non-steroidal anti-inflammatory drugs (NSAIDs) are administered with caution due to their potential to inhibit osseous union.

Oral hygiene constitutes a cornerstone of postoperative healing in Le Fort fractures. Patients are instructed to use an antiseptic mouthwash, such as 0.12% chlorhexidine, and to avoid brushing near intraoral incision sites during the first few days. Additional education is required regarding the cleaning of areas fitted with palatal splints or arch bars to prevent gingivitis and local infection.²⁵ Radiological follow-up via CT scan is indicated if there is suspicion of malunion, nonunion, hardware failure, or significant aesthetic alteration. Non-contrast CT is considered the most accurate modality for assessing fracture reduction quality, plate position, and orbital integrity.

Implant evaluation using CT is performed within 2–6 weeks postoperatively to ensure that implants have not migrated or compressed vital structures. If the patient remains free of complications, radiological control is performed strictly on clinical indication. Patients are instructed to avoid activities that increase intranasal pressure, such as forceful nose blowing, sneezing, or diving, for 4–6 weeks. This precaution is vital to prevent barotrauma, which could displace sinus or orbital reconstructions. Education regarding the risk of Cerebrospinal Fluid (CSF) rhinorrhea is provided to patients with nasofrontal junction involvement.

The recovery of masticatory and speech function typically occurs gradually. Mandibular physical therapy may be initiated once MMF is released, particularly in patients exhibiting limited mouth opening or masseter muscle spasm. Routine mandibular mobilization exercises aid in preventing postoperative trismus and accelerating oral functional recovery. Changes in facial appearance due to trauma or surgery can impact patient self-esteem; thus, counseling and education regarding the long-term healing process are highly beneficial for the patient's psychosocial adaptation.²⁴

7. CONCLUSION

Le Fort fractures represent complex maxillary injuries with profound functional and aesthetic implications, necessitating prompt diagnosis and precise management. Clinical assessment, CT imaging, and definitive surgical interventions including ORIF,

orbital reconstruction, and occlusal restoration constitute the cornerstones of successful treatment. A multidisciplinary approach combined with rigorous postoperative monitoring is essential to mitigate long-term complications and optimize both functional and aesthetic outcomes for the patient.

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Conflict of Interest Statement:

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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