BJCR
Brazilian Journal of Case Reports

PCAA
Publicações Científicas de Acesso Aberto

Case Report

Surgical Management of Extensive Facial Laceration: A Case Report

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Abstract: Tissue injuries are common consequences in the care of polytraumatized patients, with traffic accidents, falls, physical assaults, and animal bites being the main etiological factors. This study aims to report the surgical management of extensive facial laceration. A 42-year-old man was admitted to a referral hospital for emergency care in the state of Ceará, Brazil, following a motorcycle accident. On initial examination, the patient was unconscious, under mechanical ventilation via a definitive airway, and presented with multiple facial lacerations, including the midface, lateral border, lingual dorsum, and lower lip. Emergency surgical intervention was indicated for laceration suturing in the operating room. The procedure began with irrigation, debridement, and hemostatic control of the injuries. Sutures were performed sequentially, starting with the lingual dorsum and lateral border, followed by the lower lip, and concluding with layered sutures of the midface lacerations, beginning intraorally and continuing extraorally. A Penrose drain was placed on the right side due to involvement of the parotid gland in the laceration. The patient has been followed up in an outpatient setting for nine months, presenting satisfactory healing without pain or functional complaints. A meticulous understanding of facial anatomy and injury patterns is crucial to ensuring both function and aesthetics for the patient.

Keywords: Traffic Accidents; Maxillofacial Injuries; Soft Tissue Injuries.

Citation: Silva EMA, Cavalcante NKSO, Pereira RM, Vidal IB, Ferreira Filho JSF, Gondim RF, Menezes Junior KMS, Mello MJR, Carvalho ACGS. Surgical Management of Extensive Facial Laceration: A Case Report. Brazilian Journal of Case Reports. 2025 Jan-Dec;05(1):bjcr56.

https://doi.org/10.52600/2763-583X.bjcr.2025.5.1.bjcr56

Received: 26 October 2024
Accepted: 25 November 2024
Published: 15 January 2025

1. Introduction

Trauma stands as the leading cause of morbidity and mortality worldwide, with a multifactorial etiology that includes physical assaults, industrial accidents, sports injuries, gunshot wounds, and traffic accidents, the latter being the most prevalent etiological factor [1-2]. This high prevalence is directly linked to the use of two-wheeled motorized vehicles, which, due to the mechanization era and easy access to these modes of transport, have become increasingly common in urban centers. Young men aged 15 to 40 constitute the predominant group involved in accidents resulting in complex trauma [3-5].

The injuries resulting from such events have a significant impact on public health. Among the various types of injuries, maxillofacial trauma remains one of the most prominent, primarily due to the region's pronounced exposure and lack of protective coverage [3-4]. Helmets prevent approximately 40% of fatal injuries and about 13% of severe non-fatal injuries. However, one-third of motorcyclists still do not use this protective equipment. Helmets have been extensively studied for their effectiveness in mitigating injuries compared to motorcyclists who do not use them [3,7-8].

A scientific investigation highlighted that individuals aged 21 to 30 are the most susceptible to such injuries, with abrasions being the most common manifestation, followed by lacerations and contusions. Additionally, injuries involving the midface and lower face are more prevalent among patients who do not wear helmets or use open-face helmets. On the other hand, midface injuries are more frequently observed in individuals using full-face helmets [3]. Managing these injuries depends on their clinical presentation and complexity, with treatment being individualized according to the extent, depth, contamination level, etiological factors, and time elapsed since the trauma. If not appropriately addressed, such injuries may lead to significant aesthetic, functional, and psychological consequences [4,8-9].

This study aims to report a clinical case involving the surgical management of an extensive facial laceration under general anesthesia, as well as its postoperative follow-up.

2. Case Report

A 42-year-old male patient was admitted to a referral hospital for emergency and trauma care in Ceará, Brazil, following a motorcycle accident. During the emergency assessment, his Glasgow Coma Scale score was 3, and he was intubated via orotracheal route and on assisted mechanical ventilation. Physical examination revealed multiple extensive facial lacerations involving the midface, lower lip, lateral border, and lingual dorsum. Despite the severity of the soft tissue injuries, no facial fractures were identified on clinical or imaging evaluations. The patient had a history of systemic hypertension as a comorbidity.

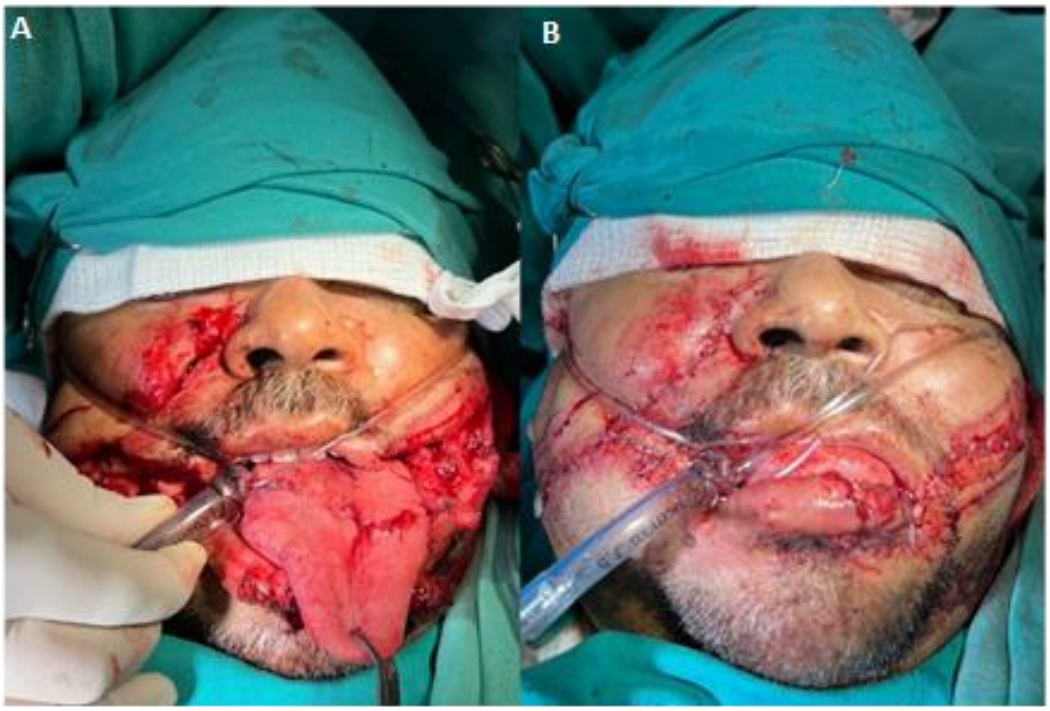
Figure 1. A. Documentation of the injury prior to surgical debridement. B. Documentation of the injury after drape placement, debridement, and wound hemostasis.

Given the presented condition, an emergency intervention was performed in the operating room for tissue synthesis. The surgical steps began with rigorous antisepsis of the intraoral and extraoral areas, followed by the placement of sterile surgical drapes, abundant irrigation with 0.9% saline solution, necrotic tissue debridement, and meticulous hemostasis control. Soft tissue reconstruction commenced with the dorsal and lateral border

of the tongue using Vicryl 5.0 absorbable sutures. Subsequently, debridement and reconstruction of the lower lip were carried out using 5.0 nylon sutures. Due to the communication of midface lacerations with the oral cavity, the sutures for the buccal mucosa lesions, bilaterally, were performed through direct access, ensuring clear visualization of the boundary between the mucosa and the skin. For intraoral lacerations, Vicryl 4.0 absorbable sutures were used for tissue synthesis.

During the reconstruction of extraoral lacerations, tissue layers were visualized, from the oral mucosa to the most superficial layer of the skin. On both sides, the parotid gland was affected due to the extent of the laceration; however, on the right side, there was more significant involvement of the salivary gland, necessitating the placement of a Penrose drain. Cutaneous sutures were performed using 5.0 nylon with a simple interrupted technique (Figure 2).

Figure 2. A. Suturing of the tongue using absorbable sutures. B. Immediate postoperative view of facial sutures.



Regarding medication, intravenous administration of Unasyn (Ampicillin 2g + Sulbactam 1g) was prescribed every six hours for seven days, along with Clindamycin 600mg intravenously every eight hours for the same period. This combination aimed primarily to prevent contamination and subsequent infection of the surgical wounds, considering the trauma's etiology. Additionally, Dexamethasone 4mg every twelve hours, Ketoprofen 100mg every twelve hours, and Dipyrone 1g every six hours were prescribed for three days following the intervention.

The patient's diet was administered via a nasoenteral tube during the seven-day hospitalization. Low-level laser therapy sessions were conducted to assist in wound healing, pain control, and edema reduction. On the sixth postoperative day, the patient showed satisfactory progress, with sutures in position and no signs of infection or dehiscence in the midface and tongue regions. However, dehiscence with active secretion was observed at the labial commissure. At this stage, photodynamic therapy with low-level laser was performed, and the drain in the right parotid region was removed.

On the seventh postoperative day (Figure 3), the patient was discharged with prescriptions for pain management medications and 0.12% chlorhexidine. The patient was

transitioning from a nasoenteral to an oral diet, showing facial edema regression and stable sutures.

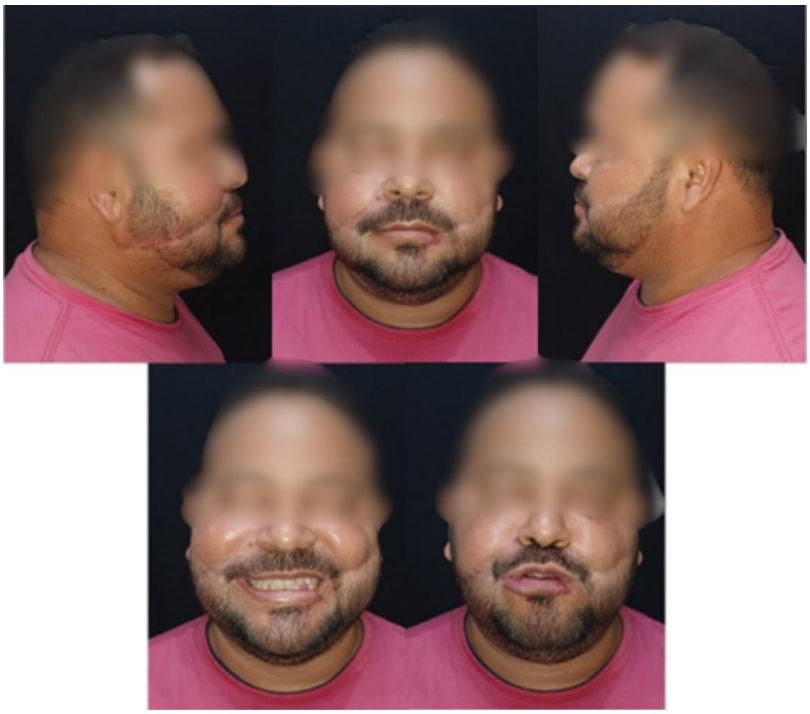
Figure 3. Postoperative day 7, showing satisfactory scarring and no signs of inflammation.

On the thirtieth postoperative day, the patient attended an outpatient follow-up appointment to assess wound healing after the removal of facial sutures (Figure 4). The patient exhibited positive signs of healing, with no evidence of infection or dehiscence.

Figure 4. Postoperative day 30 within normal limits, along with facial mimetic muscle movement during perilabial muscle contraction and smiling.

During movements involving facial expression muscles, a decrease in muscle tone and a limitation in facial expressions were observed.At nine months postoperatively (Figure 5), the patient returned to the outpatient clinic presenting visible facial scars but with preserved integrity of the muscles responsible for facial expression and functional recovery of the critical structures involved in the trauma, without signs of sialocele. Regarding neurosensory alterations, the patient reported paresthesia in the right malar region without associated discomfort, confirming the absence of aesthetic, functional, or social complaints.

Figure 5. Nine-month postoperative period showing the final appearance of the patient, as well as the functionality of the facial mimetic musculature.



3. Discussion

The etiology of maxillofacial trauma is multifactorial, encompassing traffic accidents, falls, physical assaults, industrial accidents, sports injuries, and gunshot wounds. The high incidence of traffic accidents in developing countries is attributed to multiple factors, including insufficient road safety, poor infrastructure, speeding, the use of outdated vehicles without safety features, lack of personal protective equipment, disregard for traffic laws, and low adherence to preventive measures by the local population [1,8].

Traffic accidents, more prevalent in developing countries than in developed ones, represent one of the most frequent causes of injuries in the maxillofacial region. These incidents are predominantly seen among men, especially young adults, who have a higher incidence of facial trauma. The absence, improper use, or non-use of personal protective equipment, such as helmets, significantly increases this incidence. The current case aligns with these statistics, involving a 42-year-old male motorcyclist who was not wearing a helmet at the time of the accident [3,5,11-12].

Abrasions were the most common injuries, followed by lacerations and contusions. Studies have demonstrated that individuals without helmets are significantly more susceptible to injuries compared to those using appropriate protective gear [3]. Soft tissue injuries account for 52.85% of cases, while facial fractures correspond to 48.15% of injuries affecting the oromaxillofacial region [12]. This evidence is corroborated by the present

case, where the patient suffered high-impact trauma, having collided with barbed wire while riding at high speed without wearing a helmet.

Studies have shown that the lower third of the face is particularly vulnerable to trauma in adults, with injuries ranging from soft tissue damage to facial bone fractures [5-6,11]. However, other studies indicate that injuries to the midface are more prevalent than those to the lower face [10,12]. In this case, blunt lacerations were predominantly located in the midface, while abrasive injuries were observed in the thoracic region and the upper and lower extremities.

Regarding nerve-related injuries, studies indicate a significant prevalence of wounds caused by gunshots (47%), followed by traffic accidents and sports injuries. Facial nerve injuries predominantly occurred in patients with gunshot wounds, whereas injuries to the branches of the trigeminal nerve were more frequent in gunshot wounds and less common in traffic accidents. In the present study, the patient reported paresthesia in the right malar region, likely resulting from a laceration ascending toward the right infraorbital nerve [1].

One study reported that 124 patients had nerve injuries, representing 4.98% of the total sample analyzed. A literature review revealed that approximately one-third of patients with facial fractures also have some form of neurological injury. The most common neurological injury was facial nerve deficit (62.9%), followed by infraorbital nerve deficit (27.4%) and mental nerve deficit (9.7%). Additionally, traffic accidents were identified as the leading cause of nerve injuries. The present case differs in several aspects: although the patient suffered high-impact trauma, no facial bone fractures were observed, with injuries limited to soft tissues. The patient reported paresthesia in the area of the right infraorbital nerve but showed no motor deficits in facial expression muscles. This suggests that the limitation was not due to nerve injury but rather to tissue contraction and fibrosis formation resulting from suturing [11].

One author emphasizes that facial injuries, as evidenced in this report, are deforming in nature. However, it is imperative to consider the patient holistically, adhering to the fundamental principles of initial care for polytraumatized patients, as outlined in Advanced Trauma Life Support (ATLS) guidelines. Prioritization of the patient's therapeutic needs is crucial, and once the emergency situation is stabilized, appropriate clinical and surgical treatment of facial injuries can proceed [4].

4. Conclusion

Therefore, a detailed understanding of facial anatomy and the injuries that affect it is essential to establish more precise parameters for emergency care. Long-term follow-up is particularly crucial for traumatized patients, as it allows for rigorous postoperative monitoring and reduces the risk of complications and sequelae that may impact both the patient's physical condition and social aspects. The goal is always to restore, as much as possible, proper functionality and satisfactory aesthetics, minimizing residual sequelae and promoting an improved quality of life for each patient.

Funding: Not applicable.

Research Ethics Committee Approval: We declare that the patient approved the study by signing the informed consent form, and that the study followed the ethical guidelines established by the Declaration of Helsinki.

Acknowledgments: Not applicable.

Conflicts of Interest: The authors declare no conflicts of interest.

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