

Post-Traumatic Facial Soft-Tissue Loss: A Prospective Study of 56 Cases

S. Injirahi^{1*}, S. Lamdarki¹, C. Cherrad¹, Z. Aziz¹, N. Mansouri¹¹Department of Stomatology, Maxillofacial and Aesthetic Surgery, CHU Mohammed VI, Ibn Tofail Hospital, Marrakech, MoroccoDOI: <https://doi.org/10.36347/sjmcr.2026.v14i08.018>

| Received: 19.05.2026 | Accepted: 10.07.2026 | Published: 17.08.2026

*Corresponding author: S. Injirahi

Department of Stomatology, Maxillofacial and Aesthetic Surgery, CHU Mohammed VI, Ibn Tofail Hospital, Marrakech, Morocco

Abstract

Original Research Article

Post-traumatic facial soft-tissue loss is a challenging condition in maxillofacial surgery because it may affect both essential functions and facial aesthetics. This prospective descriptive study aimed to analyze the epidemiological, clinical, and therapeutic characteristics of post-traumatic facial soft-tissue loss and to assess early morpho-functional outcomes. The study was conducted from March to September 2025 in the Department of Stomatology, Maxillofacial and Aesthetic Surgery at CHU Mohammed VI, Ibn Tofail Hospital, Marrakech. All consecutive patients admitted for post-traumatic facial soft-tissue loss and managed in the department were included; defects of tumoral or infectious origin were excluded. Fifty-six patients were included. The mean age was 30.9 years, with a range of 2 to 85 years. Men predominated, accounting for 46 patients (82.1%), and road traffic accidents were the main mechanism, observed in 49 cases (87.5%). The most frequent locations were the isolated frontal region, the isolated labial region, and the fronto-eyebrow region. Muscular involvement was found in 37 patients (66.1%), and bone exposure was present in 14 patients (25.0%). Primary closure was the most commonly used technique, performed in 47 patients (83.9%), followed by directed secondary healing, skin grafting, and local flap coverage. Early complications included wound dehiscence and cutaneous necrosis, while late complications mainly included ectropion and scar contracture. A stepwise reconstructive strategy based on careful debridement, tissue preservation, and appropriate coverage provided satisfactory early functional and aesthetic outcomes in most patients.

Keywords: facial trauma, soft-tissue defect, facial reconstruction, primary closure, skin graft, maxillofacial surgery, road traffic accident.

Copyright © 2026 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

Post-traumatic facial soft-tissue loss represents a major therapeutic challenge in maxillofacial surgery. It may occur after high-energy trauma, such as road traffic accidents, assaults, and falls from height, or after lower-energy mechanisms, including domestic accidents and bite injuries. These lesions may involve one or several anatomical layers, including skin, subcutaneous tissue, muscle, mucosa, cartilage, and bone [1-3].

The face has a complex functional and aesthetic role. Tissue loss may impair occlusion, speech, respiration, eyelid mobility, facial expression, and social interaction. Therefore, treatment must restore tissue continuity and function while preserving facial harmony and respecting aesthetic units [2,4].

The basic principles of management include early assessment, hemostasis, copious irrigation, conservative debridement, infection prevention, preservation of vascularized tissue, and rapid coverage of exposed structures. Depending on the size, depth, contamination, and location of the defect, reconstruction may include primary closure, directed secondary healing, skin grafting, local or regional flaps, and free tissue transfer in selected complex cases [3,5].

The purpose of this study was to describe the epidemiological profile, mechanisms of injury, lesion characteristics, surgical management, complications, and early morpho-functional outcomes of patients managed for post-traumatic facial soft-tissue loss in our department.

MATERIAL AND METHODS

This was a prospective descriptive study conducted over a six-month period, from March to September 2025, in the Department of Stomatology, Maxillofacial and Aesthetic Surgery at CHU Mohammed VI, Ibn Tofail Hospital, Marrakech, Morocco.

All consecutive patients admitted to the emergency department for post-traumatic facial soft-tissue loss and managed in the department during the study period were included, regardless of the mechanism of trauma. Patients with tissue loss of tumoral or infectious origin were excluded.

Data were collected using a standardized data collection form. The analyzed variables included age, sex, geographical origin, trauma mechanism, location of tissue loss, size and depth of the defect, involved anatomical structures, treatment modality, number of procedures, postoperative complications, scar evolution, functional recovery, and patient satisfaction.

The therapeutic strategy was individualized according to the site, size, depth, contamination, and viability of adjacent tissue. The main reconstructive options included direct primary closure, directed secondary healing, skin grafting, and local flap coverage.

Wound care included irrigation, debridement when required, infection prevention, and appropriate dressing protocols.

Morphological and functional outcomes were assessed in the short and medium term. The evaluation focused on scar quality, pigmentation, contour regularity, integration with relaxed skin tension lines, occlusion, mouth opening, eyelid mobility, facial expression, and patient satisfaction.

Data were entered and analyzed using SPSS and Microsoft Excel. Quantitative variables were expressed as means and ranges, while qualitative variables were expressed as numbers and percentages.

Ethical considerations: written informed consent for treatment and use of anonymized clinical photographs was obtained from all patients or legal guardians [please confirm before submission]. Institutional ethics committee approval or waiver: [to be completed according to local requirements].

RESULTS

A total of 56 consecutive patients presenting with post-traumatic facial soft-tissue loss were included and managed during the study period.

Table 1: Epidemiological characteristics of the study population

Variable	Number of patients	Percentage
Age < 15 years	9	16.1%
Age 15-30 years	21	37.5%
Age 31-45 years	19	33.9%
Age 46-60 years	4	7.1%
Age > 60 years	3	5.4%
Male	46	82.1%
Female	10	17.9%
Urban origin	35	62.5%
Rural origin	21	37.5%

The mean age was 30.9 years, with a range from 2 to 85 years. Patients aged 15-30 years represented the

largest group. A marked male predominance was observed, with a male-to-female ratio of 4.6:1.

Table 2: Circumstances of trauma

Mechanism	Number of patients	Percentage
Road traffic accident	49	87.5%
Human bite related to physical assault	2	3.6%
Animal bite	4	7.1%
Fall from height	1	1.8%

Road traffic accidents were the leading etiology, accounting for 49 cases. Bite injuries

represented a smaller proportion but were associated with complex contaminated wounds in selected patients.

Table 3: Topographic distribution of facial soft-tissue loss

Location	Number of patients	Percentage
Isolated frontal region	11	19.6%
Isolated labial region	10	17.9%
Fronto-eyebrow region	7	12.5%

Multiple facial defects	5	8.9%
Isolated cheek region	4	7.1%
Isolated nasal region	4	7.1%
Fronto-palpebral region	2	3.6%
Isolated eyebrow region	2	3.6%
External paracanthal region	2	3.6%
Palpebro-jugal region	2	3.6%
Labio-jugal region	2	3.6%
Mental region	2	3.6%
Fronto-nasal region	1	1.8%
Isolated palpebral region	1	1.8%
Preauricular region	1	1.8%

The frontal and labial regions were the most frequently affected sites. Multiple facial defects were

observed in five patients, reflecting severe mechanisms of injury.

Table 4: Depth of lesions

Depth or involved structure	Number of patients	Percentage
Superficial cutaneous involvement	4	7.1%
Muscular involvement	37	66.1%
Nasal cartilage involvement	1	1.8%
Bone exposure	14	25.0%

Muscular involvement was the most frequent finding. Bone exposure was observed in one-quarter of

the cases, highlighting the severity and depth of several injuries.

Table 5: Surgical techniques used

Technique	Number of patients	Percentage
Primary closure	47	83.9%
Directed secondary healing	6	10.7%
Skin grafting	2	3.6%
Local vestibular flap	1	1.8%

Primary closure was the most frequently used technique. Directed secondary healing, skin grafting, and local flap coverage were reserved for selected situations

depending on defect size, tissue viability, contamination, and anatomical site.



Figure 1: Patient with a dog bite presenting with extensive bilateral palpebro-jugal and labio-jugal facial soft-tissue loss



Figure 2: Immediate postoperative appearance after layered surgical closure of the facial soft-tissue defect



Figure 3: Reconstruction of a facial soft-tissue defect using a full-thickness skin graft

Table 6: Postoperative complications

Complication	Number of patients	Percentage
Wound dehiscence requiring surgical re-suturing	4	7.1%
Cutaneous necrosis requiring necrosectomy and dressings	3	5.4%
Ectropion	3	5.4%
Scar contracture, mainly nasolabial or labionasal	4	7.1%

Early complications were managed by re-suturing, debridement when necessary, and daily dressings with petrolatum-impregnated gauze. Late

complications mainly consisted of ectropion and scar contracture. Overall, early morpho-functional outcomes were satisfactory in most patients.



Figure 4: Late complication showing nasolabial scar contracture after post-traumatic facial soft-tissue loss

DISCUSSION

Post-traumatic facial soft-tissue loss is a reconstructive emergency because it may compromise

function, symmetry, and facial identity. In the present series, road traffic accidents represented the main mechanism of injury. This predominance reflects the

high-energy nature of craniofacial trauma in young active patients and explains the severity of many lesions.

The epidemiological profile was characterized by a young mean age and clear male predominance. This distribution is consistent with the exposure of young men to road traffic accidents and interpersonal or occupational trauma. The high proportion of urban patients may reflect access patterns to the emergency department and the location of the referral center.

The frontal, labial, and fronto-eyebrow regions were the most commonly affected sites. These exposed facial areas are frequently involved during direct impact. The high rate of muscular involvement and the presence of bone exposure in 25.0% of patients confirm that facial soft-tissue loss is often multilayered and may require precise anatomical repair.

The reconstructive approach must be individualized. Conservative debridement is essential because facial tissues are highly vascularized and even traumatized fragments may remain viable. The treatment goal is to obtain stable coverage, preserve function, and respect facial aesthetic units [1,2].

Primary closure was the most commonly used procedure in our series. When wound edges are viable and closure can be achieved without excessive tension, layered primary repair remains a reliable option. It allows rapid coverage, preservation of local tissue, and restoration of anatomical continuity. However, excessive tension should be avoided, particularly around the eyelids, lips, and nose, where distortion may lead to functional sequelae.

Directed secondary healing may be appropriate for selected superficial wounds or after debridement of necrotic tissue. Skin grafting is useful when primary closure is not possible, although color and texture mismatch may limit aesthetic quality. Local and regional flaps offer like-with-like reconstruction and remain key options for larger or anatomically complex defects [4,5]. Free flap reconstruction may be considered in extensive composite defects but requires appropriate technical resources and patient stability [3,6].

The observed complications were acceptable and included wound dehiscence, cutaneous necrosis, ectropion, and scar contracture. These complications underline the importance of careful wound preparation, tension-free repair, respect for relaxed skin tension lines, and long-term follow-up to detect secondary functional or aesthetic problems.

This study has several limitations. It was a single-center descriptive study with a relatively small

sample size and limited follow-up. In addition, standardized validated aesthetic and functional scoring systems were not systematically used. Future studies with longer follow-up and objective outcome assessment would provide stronger evidence regarding optimal reconstructive strategies.

CONCLUSION

Post-traumatic facial soft-tissue loss is a challenging surgical condition requiring rapid assessment and individualized reconstruction. In this prospective series of 56 patients, young men were predominantly affected, and road traffic accidents were the main mechanism. Most lesions involved the muscular layer, and primary closure was the most frequently used reconstructive technique. Careful debridement, preservation of vascularized tissue, layered anatomical repair, and appropriate coverage allowed satisfactory early functional and aesthetic outcomes in most cases. Longer follow-up and standardized assessment tools are needed to better evaluate late sequelae and refine reconstructive indications.

Acknowledgement

The authors would like to thank the medical and nursing teams of the Department of Stomatology, Maxillofacial and Aesthetic Surgery, CHU Mohammed VI, Ibn Tofail Hospital, Marrakech, for their assistance in patient care. Funding: none declared. Conflicts of interest: none declared.

REFERENCES

1. Mardini, S., & Chen, H. C. (2008). Traumatic soft tissue defects of the face: Principles of reconstruction. *Seminars in Plastic Surgery*, 22(4), 294-305.
2. Ducic, Y., Athre, R. S., & Cochran, C. S. (2013). Management of facial soft tissue trauma. *Oral and Maxillofacial Surgery Clinics of North America*, 25(4), 603-614.
3. Sadigh, P. L., & Wu, L. C. (2017). Approach to reconstruction of facial soft-tissue injuries. *Clinics in Plastic Surgery*, 44(3), 405-415.
4. Rinker, B. (2009). Reconstruction of complex facial wounds following trauma. *Clinics in Plastic Surgery*, 36(3), 403-420.
5. Costa, H., Zenha, H., Sequeira, H., Coelho, G., Gomes, N., Pinto, C., *et al.*, (2010). Local and regional flaps in facial reconstruction. *Revue de Stomatologie et de Chirurgie Maxillo-Faciale*, 111(3), 137-150.
6. Hidalgo, D. A. (2012). Principles of facial reconstruction following trauma. *Plastic and Reconstructive Surgery*, 130(5 Suppl 2), 257S-269S.