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Epidemiology and Treatment of Complex Facial Wounds in Emergency Situations in an African Context: Experience at Brazzaville University Hospital

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Abstract

Facial wounds constitute a maxillofacial surgical emergency due to their functional and aesthetic impact and the vulnerability of prominent structures. **Objective**: To describe the epidemiological profile, timing of treatment and reconstructive techniques used at Brazzaville University Hospital. **Materials and Methods:** This is a descriptive cross-sectional study with retrospective data collection, conducted in the surgical emergency department and maxillofacial surgery department of Brazzaville University Hospital from January 2020 to December 2024 on patients treated for complex facial wounds. **Results:** A total of 58 patients with complex facial wounds were included in the study. The average age was 24 ± 2 years, with a predominance of males (sex ratio = 1.9). Road traffic accidents (56.9%) and assaults (29.3%) were the most common causes of injury. The injuries observed included: loss of substance (53.5%), lacerations (34.5%), other types of wounds (12%). Immediate reconstruction was performed in 89.6% of cases. In 60.3% of cases, treatment was delayed due to the availability of the operating theatre or waiting for medication. General anaesthesia was used in 42% of cases. The main procedures performed included: flaps: 30 cases, trimming and suturing: 16 cases. No microsurgery was performed. The postoperative outcomes were considered satisfactory in 82.2% of cases. **Conclusion:** Facial wounds mainly affect young men, most often as a result of road traffic accidents. Immediate reconstruction using local flaps is the most commonly used strategy, adapted to the resources available. Limited

access to general anaesthesia remains a major constraint.

Keywords

Facial Wound, Loss of Substance, Disfigurement, Trauma, Reconstruction, Flap

1. Introduction

Facial wounds constitute a maxillofacial surgical emergency due to their functional and aesthetic impact and the vulnerability of prominent structures. Rapid treatment and the choice of reconstructive technique are key to optimal recovery and the prevention of sequelae [1] [2].

In sub-Saharan Africa, the management of facial wounds is often limited by technical constraints, restricted access to general anaesthesia and the absence of microsurgery, making immediate reconstruction using local flaps the standard strategy in most centers [3]-[5].

In Congo Brazzaville, little data exists on the timing of treatment and the techniques used to repair facial wounds in emergency departments. This study aimed to describe the epidemiological profile, timing of treatment, and reconstructive techniques used at the Brazzaville University Hospital.

2. Materials and Methods

This is a descriptive cross-sectional study with retrospective data collection, conducted in the surgical emergency department and maxillofacial surgery department of Brazzaville University Hospital over a five-year period, from January 2020 to December 2024. Our study population consisted of facial wounds treated in the department during the study period. Only complex facial wounds with usable medical records were included. That is, wounds with loss of substance, damage to vital structures, or extensive wounds.

Other facial wounds and those with unusable records were excluded. This resulted in a total of 58 complex wounds. All preselected complex wounds underwent an emergency anaesthesia consultation to assess the anaesthetic risk using the ASA (American Society of Anaesthesiologists) score. Patients classified as ASA1 (healthy with no comorbidities) by the anaesthetist-resuscitator were eligible for local anaesthesia, while others were eligible for general anaesthesia. Local anaesthesia was performed in the presence of an anaesthesia nurse, with vital signs monitored using a multi-parameter scope.

Data were collected from the hospitalization register, patient medical records completed after questioning and physical examination, and surgical reports.

The following parameters were studied: age, gender, mechanism of trauma, aetiology of trauma, time to consultation, extent of substance loss, topography, timing of repair (primary, *i.e.* trimming and reconstruction at the same time, or sec-

ondary), anaesthetic methods, reconstruction techniques, and post-operative results: aesthetic and functional appearance, and complications.

The data were entered and analysed using SPSS 30 software. Qualitative variables were expressed as numbers and percentages. Quantitative variables were expressed as means ± standard deviation. A descriptive approach was favoured, without seeking causal correlation. Data anonymity and confidentiality were respected.

3. Results

A total of 58 patients with complex facial wounds were included in the study. The mean age was 24 ± 2 years, with a predominance of males (sex ratio = 1.9). Patients under the age of 12 accounted for 13.8% of the total number (n = 8). Patients belonging to a low socioeconomic level accounted for 60.3% (n = 35), and 50 patients came from Brazzaville (86.2%). Patients were admitted by referral in 31% of cases (n = 18).

In terms of aetiology, road traffic accidents (RTAs) were the main cause in 33 cases (56.9%), of which 30.3% involved two-wheeled vehicles such as motorcycles. Seventeen physical assaults with knives were recorded (29.3%) of cases. Bites accounted for 8.6% and other mechanisms for 5.2%.

The time between the injury and the specialist consultation ranged from 1 hour to 7 days.

Clinically, the injuries observed included: loss of tissue: 53.5% (n = 31), lacerations: 34.5% (n = 20), other types of wounds: 12% (n = 7).

Forty-two per cent (42%) of tissue loss was due to assaults (n = 13).

The lesion topography is shown in **Figure 1**.

Computed tomography was performed in 25.9% of patients (n = 15), mainly due to suspected brain or bone injuries. Associated facial fractures were found in 20.7% of cases (n = 12).

In terms of treatment, the overall time to surgical intervention ranged from 3 hours to 10 days. Primary reconstruction was performed in 89.6% of cases (n = 52).

Secondary reconstruction was performed in six cases of tissue loss. The indications were contaminated wounds, two of which were caused by animal bites, with an average delay of 6 ± 0.5 days. Reoperation of the initial treatment was necessary in 19% of cases.

The temporal distribution of primary care was as follows: within the first 24 hours: 24% (n = 14), at 48 hours: 45% (n = 26), at 72 hours: 20.7% (n = 12), beyond 72 hours: 10.3% (n = 6).

In 60.3% of cases (n = 35), treatment was delayed due to the unavailability of the operating theatre or the need to wait for medication.

The anaesthetic techniques used were: local anaesthesia: 58% (n = 34), and general anaesthesia: 42% (n = 24).

Treatment systematically included prophylactic antibiotic therapy with amoxicillin clavulanic acid at a dose of 100 mg/kg/day for approximately seven days,

serum therapy and rabies vaccination for animal bites.

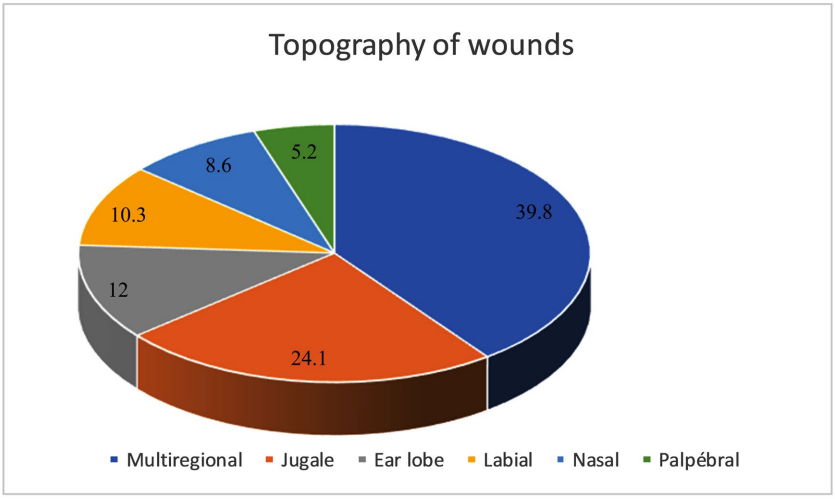

Figure 1. Distribution of wounds according to facial topography.

Figure 2. Loss of tri-tissue substance from the tip of the nose following trauma and reconstruction using a two-stage frontal flap [12].

Surgical treatment consisted of thorough washing and trimming of the wound edges, followed by direct suturing or reconstruction using local or regional flaps, depending on the topography and extent of the lesions. Osteosynthesis was performed simultaneously in 8.6% of cases.

Figure 3. Loss of trissular substance from half of the lower lip following a human bite and reconstruction by simple advancement.

Figure 4. Section of the auricle and reimplantation after washing, trimming, and placement of a splint.

The main procedures performed included: flaps: 30 cases (**Figure 2**), trimming and suturing: 16 cases (**Figure 3**) Anastomosis of the Sténon duct: 3 cases, reimplantation of the auricle: 3 cases (**Figure 4**), total skin and fibromucosal grafting: 4 cases (**Figure 5**), guided tissue repair (2).

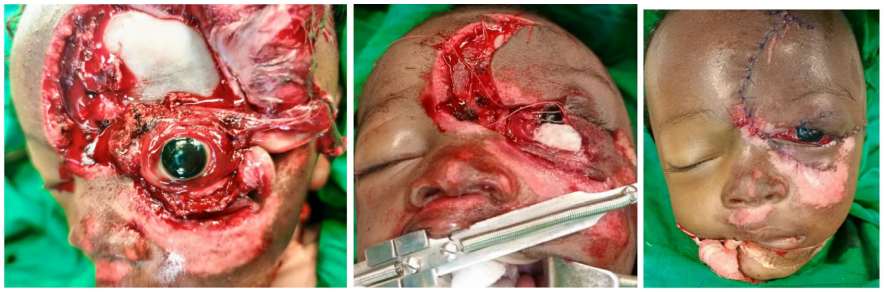

Figure 5. Multiregional deterioration, reconstruction by trimming, fibromucosal graft, and advancement and suturing.

Figure 6. Multiregional deterioration treated late by guided healing and then full-thickness skin grafting, resulting in disfiguring and disabling ocular sequelae.

No microsurgery was performed.

Follow-up for more than three months was obtained in 43.1% of patients (n = 25).

The postoperative course was considered complication-free in 82.8% of cases (n = 48).

Complications observed included: cosmetic damage in 17.2% of patients (**Fig-**

ure 6), insufficient nasal projection after reconstruction (1 case), and postoperative superinfection (2 cases).

4. Discussion

In this series of complex facial injuries treated in the emergency department of Brazzaville University Hospital, several factors stand out in comparison with studies published in African and international contexts.

The average age observed (24 ± 2 years) and the predominance of males are consistent with many African studies. Adeyemo *et al.* in Nigeria also described a strong male predominance among young patients with maxillofacial trauma, mainly related to road traffic accidents [6]. Similarly, Chidzonga in Zimbabwe reported that the majority of facial trauma victims were young men, which is often attributed to increased exposure to urban and road risks [7].

However, the high proportion of stabbings (29.3%) in our series is remarkable and differs from several African series where accidents (mainly traffic accidents) clearly predominate. For example, Okoje *et al.* reported a clear predominance of road traffic injuries in Ibadan, with a low incidence of physical assaults [8]. In our context, violent assaults resulting in the loss of anatomical structures (lip, nose, earlobe) are a significant aetiological factor, highlighting a particular reality of urban violence linked to the phenomenon of assaults by gangs of young people known as "bébés noirs" (black babies).

The time between consultation and surgical treatment is a crucial factor in facial trauma. In our series, this time ranged from a few hours to 10 days, and the majority of patients underwent surgery within the first 24 to 48 hours. This responsiveness is consistent with the approach recommended in the literature to reduce complications and optimise functional and aesthetic outcomes [9]-[12].

However, the difficulty of accessing general anaesthesia is a significant constraint. In our study, local anaesthesia was used in 58% of cases, while general anaesthesia was only possible in 42%. This predominance of local anaesthesia is mirrored in certain African series, where limited resources lead to a preference for less resource-intensive anaesthesia methods [13]-[15]. In contrast, in series from countries with high resources, general anaesthesia is generally systematic for complex facial wounds, allowing for complete exploration and more precise reconstruction [16].

The limitation of general anaesthesia in our context is linked to several organisational factors: limited availability of operating theatres, lack of anaesthetists, peak hours not covered, and the socio-economic conditions of patients (waiting to purchase drugs before scheduling the theatre). This organisational delay is a peculiarity that is rarely described in Western series but frequently mentioned in the literature on emergency care in sub-Saharan Africa, particularly in cases of head and neck trauma [17].

Primary reconstruction was performed in 85% of cases, with preference given to local flaps and direct sutures. This finding is similar to that of many African

authors, who favour simple, quick and reliable techniques due to the lack of microsurgery and specialised facilities [18]. Ndayisaba *et al.* reported that local flaps are safe options in resource-limited settings, although they do not always allow for optimal restoration of aesthetic contours [19].

The complete absence of microsurgery in our series, despite certain indications, reflects a major institutional technical limitation. In centers with microsurgery facilities, this type of reconstruction is associated with better aesthetic and functional results, particularly for complex tissue loss [20]. The absence of such facilities in our context is a clearly identifiable constraint on treatment [21] [22].

Follow-up beyond three months was only possible in 43.1% of patients. This limited follow-up rate is comparable to that described in the African literature, where logistical, economic and social difficulties compromise long-term post-surgical follow-up [14].

This lack of comprehensive follow-up limits the objective assessment of functional and aesthetic outcomes, as well as the estimation of late complications due to the inability to better identify the postoperative status of absent patients.

Several aspects clearly distinguish our study within the African landscape:

The high proportion of wounds related to knife attacks, with severe anatomical loss, exceeds that reported in many series where road traffic injuries predominate [21] [22].

The specific anaesthetic constraints, with relatively frequent use of regional anaesthesia in emergencies, reflect realistic organisational limitations in a resource-constrained setting.

The difficulty of long-term follow-up highlights a significant gap in continuity of care, which is often underestimated in similar studies.

These factors underscore the importance of contextualising the management of complex facial wounds within local sociocultural and organisational realities, which is the major originality of this series.

Furthermore, the limitations of the study were related to the retrospective nature of the sample, the small sample size, and difficulties associated with incomplete follow-up.

5. Conclusion

In the emergency department of Brazzaville University Hospital, facial wounds mainly affect young men, most often as a result of road traffic accidents. Prompt treatment and the use of appropriate reconstructive techniques are essential to minimise sequelae. Immediate reconstruction using local flaps is the most commonly used strategy, adapted to the available resources. Limited access to general anaesthesia and microsurgical techniques remains a major constraint, highlighting the need to strengthen technical and organisational capacities.

Author Contributions

All authors contributed to the completion of this work. All have read and ap-

proved the final version of this manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

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