

Drainage of Cervico-Facial Cellulitis under Local Anaesthesia in a Resource-Limited Centre: A 3-Year Descriptive Study

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How to cite this paper: Mabika, B.D.D., Ngoua Essininguele, L., Niengo Outsouta, G., Faye, A.D., Bamboula, C., Monkessa, M.E. and Ondzotto, G. (2026) Drainage of Cervico-Facial Cellulitis under Local Anaesthesia in a Resource-Limited Centre: A 3-Year Descriptive Study. *Open Journal of Stomatology*, 16, 61-68.

<https://doi.org/10.4236/ojst.2026.163007>

Received: January 13, 2026

Accepted: March 22, 2026

Published: March 25, 2026

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Abstract

Introduction: The standard treatment combines antibiotic therapy and early surgical drainage, ideally under general anaesthesia. However, in certain constrained contexts, drainage is performed under local anaesthesia. **Objective:** To describe the clinical, therapeutic and evolutionary characteristics of cervico-facial cellulitis drained under local anaesthesia. **Materials and Methods:** This is a descriptive cross-sectional study with retrospective data collection, conducted in the Stomatology and Maxillofacial Surgery Department of the Brazzaville University Hospital over a three-year period, from January 2021 to December 2023, on cervico-facial cellulitis under local anaesthesia. **Results:** 140 patients underwent local anaesthesia. The average age was 31.8 ± 1.5 years, with a predominance of males. The types of anaesthesia used were: local anaesthesia with reinforced lidocaine and adrenaline (57.9%) and local anaesthesia alone in 42.1% of cases. Significant intraoperative pain was reported in 72.1% of cases. Etiological dental treatment was delayed by an average of 6 days. **Conclusion:** Drainage of cervico-facial cellulitis under local anaesthesia is an alternative imposed by resource constraints. Although it allows initial control of the infection, this approach is accompanied by imperfect analgesia, limited surgical intervention and prolonged post-operative effects.

Keywords

Cervico-Facial Cellulitis, Local Anaesthesia, Drainage, Lavage, Antibiotics

1. Introduction

Cervicofacial cellulitis is a diffuse infection of the soft tissues, mainly of odontogenic origin, which can progress to collected or gangrenous forms, compromising functional and vital prognosis. It remains common in countries with limited resources, where self-medication and delayed consultation lead to admission at advanced stages [1]-[3].

The standard treatment combines antibiotic therapy and early surgical drainage, ideally under general anaesthesia, ensuring airway control and complete debridement [4] [5].

However, in certain constrained contexts, drainage is performed under local anaesthesia due to financial or logistical limitations [3].

Although pragmatic, this approach could influence the quality of the surgical procedure and postoperative outcomes. There is little data documenting this practice in the African context. The aim of this study was to describe the clinical, therapeutic and evolutionary characteristics of cervico-facial cellulitis drained under local anaesthesia.

2. Materials and Methods

This is a descriptive cross-sectional study with retrospective data collection, conducted in the Stomatology and Maxillofacial Surgery Department of the Brazzaville University Hospital over a three-year period, from January 2021 to December 2023. All patients treated for cervico-facial cellulitis constituted our study population. All pre-selected patients underwent an emergency anaesthesia consultation to assess 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 and included in our study. Local anaesthesia was performed in the presence of an anaesthetic nurse, with vital signs monitored using a multi-parameter scope.

Incomplete records were excluded.

The following parameters were studied: age, sex, comorbidities (HIV, diabetes), aetiology, time to consultation and self-medication, topography, clinical stage, type and technique of anaesthesia, time of drainage, surgical procedure, intraoperative pain, length of hospitalisation, compliance with follow-up, dental aetiological treatment, postoperative results and the criterion for choosing local anaesthesia.

The data were entered and analysed using SPSS 2.0 software. Qualitative variables were expressed as numbers and percentages. Quantitative variables were expressed as means \pm standard deviation. A descriptive approach was favoured, without seeking causal correlation. Data anonymity and confidentiality were respected.

3. Results

246 patients were hospitalised for cervico-facial cellulitis, 29 received non-surgical treatment, *i.e.* in the serous phase (11.8%), and 217 received surgical treatment,

i.e. 110 in the collected phase (44.7%) and 107 in the gangrenous phase (43.5%).

Of the 217 cases of cellulitis treated surgically, only 140 were treated under local anaesthesia (65.7%), thus constituting the size of our sample.

The average age was 31.8 ± 1.5 years, with a predominance of males (sex ratio = 1.3).

A delay of more than 7 days in seeking medical attention was found in 95% of patients, often associated with self-medication in 96.4% of cases, particularly with non-steroidal anti-inflammatory drugs.

Clinically, cervical and submandibular locations were the most common (75%). The aetiology found was dental in 98% of cases.

The main clinical signs were:

- Pain (100%), more intense in the collected phases,
- Swelling, purulent discharge, blackish skin,
- Crepitus, fluctuation, foul-smelling necrotic wounds.

Trismus, dysphagia and dyspnoea were among the functional signs.

The average length of hospitalisation was 15 days, ranging from 6 to 40 days, with the need for repeated treatment in 52.1% of cases. Diabetic patients accounted for 19.3% of cases and had a more prolonged course of illness. Those who were HIV-positive accounted for 9.3% of cases.

In terms of treatment, the timing of care varied (**Figure 1**).

Treatment systematically included probabilistic dual antibiotic therapy.

The criterion for choosing local anaesthesia was motivated by the inability to afford the cost of general anaesthesia in 93.5% of cases and by the accessibility of the lesion in 6.5% of cases.



Figure 1. Loss of retractile tissue in the cervical region following drainage for cervico-facial cellulitis under local anaesthesia, with prolonged postoperative effects. Trimming, rejuvenation of the lost tissue and coverage with a full-thickness skin graft under local anaesthesia.

The types of anaesthesia used were locoregional anaesthesia with lidocaine and adrenaline, reinforced by intravenous analgesia (57.9%), and locoregional anaesthesia alone in 42.1%.

Three types of anaesthetic techniques were used, often in combination, with two common features: rigorous asepsis of the injection sites and infiltration away from the infected areas:

- Peripheral infiltration into healthy tissue.
- Local regional nerve block.

- Ring infiltration (“ring block”).

In 83.6% of cases, treatment was delayed due to the unavailability of medication.

Surgical treatment consisted of thorough washing, drainage of pus, debridement and necrosectomy, followed by daily washing and dressing. A skin graft was performed at a later date in five cases (**Figure 2**). Deep necrosectomy could not be performed initially in the majority of patients. Five cases were converted to general anaesthesia secondarily.

Significant intraoperative pain was reported in 72.1% of cases. Etiological dental treatment was delayed by an average of 6 days. Early loss of postoperative follow-up (after 21 days) affected 75% of patients.

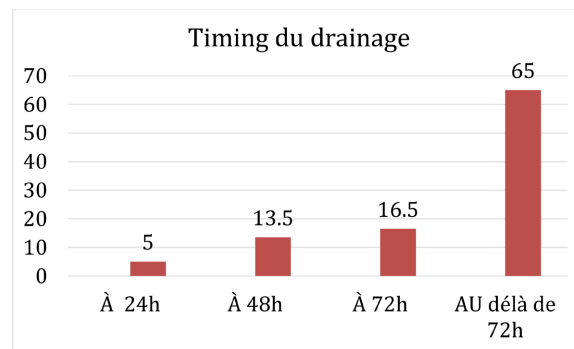


Figure 2. Distribution of drainage time.

Postoperative outcomes were satisfactory in 70% of cases, but several complications were observed: delayed healing, insufficient drainage or initial necrosectomy, persistent local superinfection, persistent respiratory disorders, local extension of skin necrosis, persistent glycaemic imbalance (in 55.6% of diabetics), and three cases of chronic fistulas.

HIV-positive patients presented with more severe forms and a prolonged course.

Deaths: 14 cases (10%), often related to acute respiratory distress or generalised sepsis.

4. Discussion

Our results (average age 31.8 years, predominantly male) are consistent with those reported by several African authors [6]-[8] who describe a young, male population, often from a modest socio-economic background.

Self-medication and the misuse of NSAIDs promote rapid progression to gangrenous or collected forms [1] [3]. The use of NSAIDs prior to hospitalisation is already recognised as a factor aggravating the progression of the infection, masking the signs of inflammation and promoting the spread of cellulitis [2].

A delay of more than 7 days in seeking medical advice was found in 95% of patients, which is lower than that reported by Bazame CBT, *et al.* [8], but remains a key factor in severity. This can be explained by a lack of knowledge about the

disease, financial constraints, and difficulty in accessing referral facilities.

The cervical and submandibular locations (75%) were the most common, with 98% of cases having a dental aetiology, which is consistent with the classic data on cervico-facial cellulitis, where dental infection is the main source [1]-[3] [7] [8]. This highlights the need for structured oral hygiene.

The main clinical signs observed were characteristic of severe forms of cellulitis, particularly when there was purulent collection or extensive necrosis, confirming the clinical presentation described in other hospital series [2] [3].

In our study, 19.3% of patients were diabetic, with a more prolonged course, and 9.3% were HIV-positive.

Diabetes is recognised as a factor in slower progression and delayed healing, and increases postoperative morbidity, which is aggravated by incomplete drainage, confirming the importance of glycaemic control [10].

Similarly, HIV-related immunosuppression is a factor in severity, with a higher incidence of complex forms of cellulitis [11].

Difficulties in follow-up and delays in causal dental treatment expose patients to the risk of maintaining the infectious focus, as highlighted by Flynn *et al.* Early aetiological management remains essential but is made difficult by the anaesthetic modality [1] [4] [12].

In our study, three anaesthetic techniques were often used in combination:

- Peripheral infiltration into healthy tissue. This involved injecting the local anaesthetic into the tissue adjacent to the site of infection, without crossing the inflamed area. The aim was to create a halo of analgesia around the area to be treated. This technique is suitable for accessible localised cellulitis and limited incision-drainage procedures [13].

- Locoregional nerve block, which allowed deep anaesthesia of the facial areas. This technique is indicated when infiltration alone may be ineffective, particularly due to local acidosis or intense pain [14].

- Ring infiltration (“ring block”)

This consisted of several peripheral micro-injections around the surgical site, forming an anaesthetic barrier. It is particularly useful for localised incision and drainage procedures and allows a large area to be covered without penetrating the site of infection [14] [15].

This approach remains an alternative and a pragmatic adaptation to local constraints, particularly in resource-limited settings, highlighting that drainage under local anaesthesia is feasible even in the absence of general anaesthesia [3], which allows for immediate treatment, reducing the risk of infection progression, and financial and organisational accessibility for patients in resource-limited settings.

Despite its feasibility, this approach has significant clinical limitations:

- Intraoperative pain: limits patient comfort and cooperation.
- Incomplete surgical procedure: deep necrosectomy rarely possible, repeated washing required.
- Prolonged hospitalisation: 2 to 3 times longer than under general anaesthesia.

- Delay in causal dental treatment: promotes the persistence of the infectious focus and the risk of recurrence.

These observations are consistent with the literature: Flynn *et al.*, Boscolo-Rizzo and Da Mosto emphasise that drainage under general anaesthesia remains the standard for ensuring safety and efficacy [4] [5] [15].

Nevertheless, the efficacy of local anaesthetics in the context of cellulitis is influenced by several pathophysiological factors. Tissue acidosis associated with inflammation reduces the proportion of the non-ionised form of the anaesthetic capable of crossing the nerve membrane, thereby reducing its efficacy [3]. This observation justifies the need to inject away from the site of infection, whether by peripheral infiltration, nerve block or ring infiltration. Comparative studies suggest that the combination of nerve block and peripheral infiltration offers more reliable analgesia than infiltration alone, particularly for posterior mandibular teeth or extensive cellulitis [15]-[17]. In addition, the use of more fat-soluble anaesthetics such as 4% articaine may improve diffusion in inflamed tissues and offer greater intraoperative comfort [18], which is not used in our context.

Finally, it should be noted that diffuse or gangrenous forms, severe trismus or respiratory distress remain absolute indications for general anaesthesia, as local regional techniques would be insufficient to ensure effective analgesia and optimal safety [19].

Furthermore, the prolonged hospitalisation observed is consistent with the conclusions of Storoe *et al.*, who demonstrate that complete initial drainage reduces postoperative morbidity [1].

Postoperative outcomes were considered satisfactory in 70% of patients.

A total of 14 deaths (10%) were recorded, often related to acute respiratory distress or generalised sepsis. This mortality rate is comparable to that described in series where progression to severe forms and delayed treatment are key factors in poor prognosis [1] [2] [4] [9] [11].

This study highlights the gap between international recommendations and reality in the field, while documenting advantages, limitations and prospects. Provides a scientific basis for improving protocols in resource-limited settings.

5. Conclusion

Drainage of cervico-facial cellulitis under local anaesthesia is an alternative imposed by resource constraints. Although it allows initial control of the infection, this approach is accompanied by imperfect analgesia, limited surgical intervention and prolonged post-operative effects. Improving access to general anaesthesia, careful selection of possible indications for local anaesthesia and early aetiological management are key factors in optimising prognosis.

Authors Contributions

All authors contributed to this work. All authors have read and approved the final version of this manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

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