



Original Article

Osteitis of the Jaws of Dental Origin in Yaounde (Cameroon)

Ostéites des Mâchoires d'Origine Dentaire à Yaounde (Cameroun)

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ABSTRACT

Introduction. Osteitis of the jaws is an inflammatory disease of the bony tissues of the maxilla and mandible. This osteitis is often of dental origin. The aim of our study was to describe the epidemiological, clinical and therapeutic aspects of osteitis of the jaws of dental origin. **Methodology.** This was a descriptive study, with a retrospective data collection, conducted in the odontostomatology departments of the Yaounde Central Hospital (YCH) and of the Yaounde University Teaching Hospital (YUTH), Cameroon. Data were collected from January 2018 to December 2022. All patients presenting for a consultation or referred for osteitis of the jaws were included. The parameters studied were socio-demographic profile, history, clinical paraclinical aspects, treatments carried out and their evolution. **Results.** Of 2351 cases, 54 were included, representing a global hospital prevalence of osteitis of 2.3%. Only 41 of the 54 cases were retained. Males were more affected (56.1%), with a sex ratio of 1.28. The average age was 40.5 ± 10.8 years. The main reason for consultation was pain in 68.2% of cases. Osteitis often followed dental avulsion (48.8%). Osteomyelitis was more common in our study (63.4%). All patients underwent medical and surgical treatment. **Conclusion.** Dental osteitis of the jaws is a serious condition. Early, specialised and even multidisciplinary management is important.

RÉSUMÉ

Introduction. L'ostéite des mâchoires est une affection inflammatoire des tissus osseux du maxillaire et de la mandibule. Ces ostéites sont souvent d'origine dentaire. L'objectif de l'étude était de décrire les aspects épidémiologiques, cliniques et thérapeutiques des ostéites des mâchoires d'origine dentaire. **Méthodologie.** Il s'agissait d'une étude descriptive, à collecte de données rétrospective, réalisée dans les services d'odontostomatologie de l'hôpital central de Yaoundé et du Centre Hospitalier Universitaire de Yaoundé (Cameroun). La collecte de données a été faite sur des dossiers de janvier 2018 au décembre 2022. Etaient inclus tous les dossiers de patients venus en consultation ou référé pour ostéite des mâchoires. Les paramètres étudiés étaient le profil sociodémographique, les antécédents, les aspects cliniques paracliniques, les traitements effectués et leur évolution. **Résultats.** Des 2351 dossiers, 54 dossiers étaient inclus, soit une prévalence hospitalière d'ostéites de 2,3%. Seuls 41 sur 54 dossiers ont été retenus. Le genre masculin était plus affecté (56,1%), sex-ratio de 1,28. La moyenne d'âge était de $40,5 \pm 10,8$ ans. Le principal motif de consultation était la douleur dans 68,2% des cas. L'ostéite faisait souvent suite à une avulsion dentaire (48,8%). Les ostéomyélites étaient plus retrouvées dans notre étude à 63,4%. Un traitement médico-chirurgical a été effectué chez tous les patients. **Conclusion.** L'ostéite des mâchoires d'origine dentaire est une pathologie grave. Une prise en charge précoce, spécialisée voir multidisciplinaire, est importante.



INTRODUCTION

Osteitis of the jaws is an inflammatory disease of the bony tissues of the maxilla and mandible [1, 2]. Their aetiology may be primary or secondary to a local or general cause. In the majority of cases, osteitis is caused locally by infection (bacterial, mycotic or viral), trauma and/or tumour (benign or malignant) [1, 2]. In the maxillofacial region, dental causes are often incriminated in the aetiology of osteitis, with rates varying from 74-90% depending on the country [2-4]. The clinical appearance of dental osteitis of the jaws varies according to location, extent, duration and the presence or absence of suppuration. Diagnosis is relatively straightforward, but often requires further investigation. Dental osteitis of the jaws can cause significant functional and aesthetic sequelae, leading to a certain morbidity in those affected. They therefore require careful management in a specialist environment [1-3, 5]. Dental osteitis of the jaw is still quite common in developing countries [1, 3, 5]. The aim of this study was to describe the epidemiological, clinical and therapeutic aspects of osteitis of the jaws of dental origin at the Yaounde Central Hospital (YCH) and the Yaounde University Teaching Hospital (YUTH), Cameroon.

METHODOLOGY

This was a retrospective study conducted in the odontostomatology departments of the Yaounde Central Hospital (YCH) and the Yaounde University Teaching Hospital (YUTH), Cameroon, respectively. This study was conducted for one year, from June 2022 to June 2023. Data were collected on records from January 2018 to December 2022. We included in this study all the records of patients who came for consultation or were referred to the above-mentioned departments, treated as outpatients or hospitalised for osteitis of the jaws, without age limitation. Files that could not be used or with incomplete data for osteitis of the jaws of dental origin and those relating to osteitis of the jaws of non-dental origin were excluded from our study. The parameters studied were sociodemographic data, personal history, clinical and paraclinical aspects, as well as treatments carried out and their progress. Data were entered and analysed using SPSS version 23.0 software.

RESULTS

We recorded 2,351 patient records at two study sites: 1,341 at the YCH and 960 at the YUTH. Of these 2351 cases, 54 were included, for an overall hospital prevalence of osteitis of 2.3%. Of the 54 cases, 41 were retained, 08 cases were excluded because they could not be used, and five cases were excluded because the aetiology of the osteitis was not dental. Epidemiologically, males were the most affected, accounting for 56.1% of cases (n=23), with a sex ratio of 1.28. The mean age was 40.5 ± 10.8 years, with extremes of four and 75 years. Patients with secondary education accounted for 48.8% (n=20) of the total. Patients living in rural areas accounted for 65.9% (n=27). In our study population, with regard to comorbidity factors, four patients (9.8%) were hypertensive and three patients (7.3%) had diabetes. Two

patients (4.9%) smoked and one (2.4%) drank alcohol, as shown in Table I.

Table I : Distribution of the population according to socio-demographic data and clinical history.

Variables	N	%
Mean age	40.5 ± 10.8	
Male	23	56.1
Level of study		
None	3	7.3
Primary	13	31.7
Secondary	20	48.8
Superior	5	12.2
Place of residence		
Urban	14	34.1
Rural	27	65.9
Associated general Pathologies		
Diabète	3	7.3
Hypertension	4	9.8
Lifestyle		
Alcohol	1	2.4
Tobacco	2	4.9

The main reason for consultation was pain in 68.2% of cases (n=28). In our series, 33 patients (81.5%) consulted us at least four weeks after the onset of the first symptoms. Osteitis followed dental avulsion in 20 patients (48.8%) and dental infection in 17 patients (41.4%) (Table II).

Table II : Distribution of the population according to the reason for consultation, the time taken to consult and the circumstances in which the disease occurred.

Variables	N	%
Reason for consultation		
Pain	28	68.2
Facial asymmetry/swelling	5	12.2
Purulent discharge	4	9.8
Bone exposure	4	9.8
Consultation time		
≤ 04 weeks	8	19.5
> 04 weeks	33	81.5
Circumstances of occurrence		
Dental avulsion	20	48.8
Dental Infection	17	41.4
Dental trauma	4	9.8

Exobuccal clinical aspects were marked by facial asymmetry in 65.9% (n=27). The presence of a skin fistula was found in 08 patients (19.5%). Trismus was noted in 10 patients, either 24.4% of our study population (Table III). At the endo-buccal level, we mainly found purulent discharge in 22 patients (53.7%), followed by cortical deformity in 21 patients (51.2%). Bone denudation and dental mobility were present in 46.3% of 19 patients. The presence of endo-buccal mucosal fistula was noted in 12 patients (29.3%). Pathological fractures were found in 9.8% (n=4). Pain was the most frequently reported symptom in our study, affecting 30 patients (73.2%). Five patients (12.2%) complained of dysaesthesia. Bone lesions were mainly located in the mandible in 32 patients (78%). Osteomyelitis was the most common lesion in our

study (63.4%) in 26 patients, followed by alveolitis (26.8%) in 11 patients (Table III).

Table III : Distribution of the population according to clinical data.

Variables	N	%
Exobuccal signs		
Facial assymetry/swelling	27	65.9
Skin fistula	8	19.5
Trismus	10	24.4
Endobuccal signs		
Purulent discharge	22	53.7
Cortical blowing	21	51.2
Bone denudation	19	46.3
Mucous fistula	12	29.3
Tooth mobility	19	46.3
Pathological fracture	4	9.8
Associated symptoms		
Pain	30	73.2
Dysesthesia	5	12.2
None	6	14.6
Localisation of lesion		
Mandibular	32	78.0
Maxillary	9	22.0
Type of lesion		
Alveolitis	11	26.8
Osteitis	4	9.8
Osteomyelitis	26	63.4

At the paraclinical level, panoramic dental radiography was prescribed in 33 patients (80.4%) and maxillofacial computed tomography (CT) in 07 patients (17.1%). Bacteriological studies were carried out in 13 patients (31.7%). The results were positive in 7 out of 13 patients, either 53.8% of cases in this series. The germ most frequently found was *Staphylococcus* spp (57.1%) (Table IV).

Table IV : Breakdown of the population according to bacteriological examinations.

Variables	N	%
Bacteriological cultures		
Yes	13	31.7
Type of sample (n=13)		
Bone sequestration	9	69.2
Purulent fluid	4	30.8
Bacteriological results (n=13)		
Positive	7	53.8
Germs isolated (n=7)		
<i>Staphylococcus</i>	4	57.1
<i>Enterobacter</i>	2	28.6
<i>Streptococcus</i>	1	14.3

In terms of treatment, all patients in our study underwent medical and surgical treatment. Outpatient treatment was used in 61.0% of cases (n=25), compared with 16 inpatients (39%). In terms of medical management, we found 22 cases of dual therapy (53.7%). Amoxicillin + clavulanic acid was used in 73.2% (n=30), followed by metronidazole in 22 patients (56.0%). Chlorhexidine-based local antiseptics were administered to all patients. All patients had been prescribed a level 1 analgesic, paracetamol 60 to 80 mg/kg/day (Table V).

Table V : Breakdown of the population according to medical management.

Variables	N	%
Type of antibiotic therapy		
Monotherapy	7	17,07
Dual therapy	22	53,7
Triple therapy	12	29,26
Antibiotics prescribed		
Amoxicillin + clavulanic acid	30	73,2
Metronidazole	22	53,7
Lincocin	12	29,26
Other*	4	9,7

*Doxycycline, Imipenem, Ceftriaxone, Clindamycin

Surgical treatment was performed under locoregional anaesthesia in 30 patients (73.2% of cases). Sequestrectomy was performed in 15 patients (36.6%), followed by bone curettage in 12 patients (29.3%). Fistulectomy was performed in 05 out of 08 patients with a skin fistula (62.5%), as shown in Table VI.

Table VI : Distribution of the population according to surgical management.

Variables	N	%
Type of anaesthesia		
Locoregional	30	73,2
General	11	26,8
Surgical procedure		
Bone curettage	12	29,3
Decortication	8	19,5
Sequestrectomy	15	36,6
Resection*	6	14,6

* interruptive resection and non interruptive resection

Follow-up was straightforward in 35 patients (85.4%). However, we found complications in 6 patients (14.6% of cases), dominated by cases of maxillary sinusitis (50% of cases) in three of the six patients. There was one case of jaw constriction and one of tissue necrosis. One death was reported as a result of complications. The sequelae rate was 39.0% (n = 16), related to unsightly scars and/or persistent bone deformity.

DISCUSSION

Osteitis of the jaws is relatively common in developing countries, despite advances in oral hygiene, access to care and antibiotic therapy [1, 3, 5]. In this study, osteitis of the jaws of dental origin accounted for 2.8% of cases collected over five years at the YCH and the YUTH. Our results are similar to those found in the literature, which describes a prevalence of osteitis of dental origin of between 2.41-15% [6, 7].

The mean age of patients at diagnosis was 40.5 ± 10.8 years in our study. Our results are comparable to those of André et al., and Peravali et al., who observed an average age of 42 and 44 years respectively. However, Ntep et al., found an average age of 34 years in their series. Julien et al., also noted an average age of 32.7 years [2, 4, 6, 8]. This means that the age of onset of osteitis of the jaws is between 30-50 years.

In our series, men predominated. This may be explained by the fact that men are more careless about their oral

hygiene. Many authors, such as Koorbusch et al., Baltensperger et al., Peravali et al., and Baur et al., also found a male predominance in their studies [4, 9-11]. In contrast, Haeffs et al., observed a predominance of women [12]. On the other hand, studies by Ory et al., and Aka et al., found no gender specificity [7, 13].

In this study, diabetes and hypertension were the associated comorbidities, as had also been shown by Baur et al. Diabetes and hypertension are pathologies known to lead to microvascular remodelling of organs, thus weakening their defence system against pathogens. Peravali et al., found an association between uncontrolled diabetes and osteomyelitis [4, 11].

Pain was the primary reason for consultation in 68.2% of cases. Despite this, 81.5% of cases had come for a consultation four weeks after the onset of the first symptoms. This could be explained by a lack of information about the condition and/or the precarious socio-economic situation of patients. Ory et al., and Ouedraogo et al., also noted a delay in consultation [3, 7]. With regard to clinical aspects, pain (73.3%) and facial asymmetry/swelling (65.9%) were the signs and symptoms most commonly found in our study population, in line with what has been described in the literature (figure 1).



Figure 1 : Exobuccal profile image of an adolescent girl with osteitis, showing swelling and a pus-producing skin fistula in the masseterine region with exposed bone sequestrum.

Baur et al., reported pain (41.6%) and swelling (58.3%). André et al., reported pain in all their patients and swelling in 85% of cases. Koorbusch et al., noted the presence of pain and swelling in 71% of cases [2, 9, 11]. Lesions were mainly located in the mandible in 32 patients (78%) (figures 2 and 3).



Figure 2 : Endobuccal image of a patient with mixed dentition, showing infectious maxillary osteolysis ranging from 64-16 with exposed bone.



Figure 3 : Endobuccal image showing osteitis of dental origin leading to denudation of the right mandibular body with production of purulent fluid at 46.

This location may be explained by the precariousness of the terminal vascular system of the mandible, the rare anastomoses and low flow rates, and its cortico-spongiosa structure. Our results corroborate those of the literature. André et al., found in their series 87% of cases of osteitis in the mandible. Koorbusch et al., found mandibular osteitis in 86% of their cases. Prasad et al., in their series on osteitis of the head and neck, found that the mandibular bone was most affected (38% of cases), followed by the frontal bone, cervicals and maxillae. [2, 9, 14]. These data are contrary to those of Peravali et al., who found a predominance of maxillary involvement (51%) [4]. Osteomyelitis was the most common type, accounting for 63.4% of cases. This could be explained by the fact that, as the teeth are located within the bony alveoli of the jaws, damage of dental origin is more likely to develop through direct contact with the cancellous bone than with the cortical bone [1].

Panoramic dental radiography shows the images of osteolysis, osteocondensation and bone sequestration described in the literature. Computed tomography provides a more exhaustive and detailed assessment of the lesions. It is requested mainly for extensive lesions of the mandible or for certain lesions in the maxilla (figures 4 and 5).



Figure 4 : Dental panoramic image, showing osteitis of dental origin leading to bone lysis with loss of continuity of the basilar margin of the right mandibular body



Figure 5 : Maxillofacial CT scan, bone window, showing osteitis of dental origin of the left mandible in sagittal section with sequestration + pathological fracture of the condylar neck of the left mandibular ramus

In our series, panoramic dental radiography was the most frequently prescribed radiological examination because it was more accessible and less expensive than maxillofacial CT [12, 15, 16].

The germs that can cause osteitis are many and varied. The normal microbial flora of the mouth, facial sinuses and skin may be involved in the development of facial osteitis. In the jaws, osteitis is often polymicrobial and its source is mainly odontogenic. Staphylococci, streptococci, pneumococci, Haemophilus parainfluenzae, Gram- and Gram+ germs are generally found. Mycelial germs may also be detected [16, 17, 18]. In patients with a history of poorly treated dental infection or alveolar trauma, the presence of staphylococci and enterococci should be greatly taken into account [19-21]. In our study, bacteriological examination was requested in 13 out of 41 patients and the results were positive in 7 out of 13 patients, either 53.8% of cases, with Staphylococcus spp as the main germ isolated in 57.1% of cases.

In the chronic phase, osteitis is often treated medico-surgically. In the acute phase, prescription medication may be sufficient, especially in children. As far as antibiotic therapy is concerned, the spectrum of action and the rate of penetration of antibiotics into bone tissue are considered to be determining factors in the therapeutic success of osteitis. However, the effectiveness of an antibiotic in infected bone tissue depends on its pharmacological characteristics, the degree of vascularisation of the tissue, the presence or absence of foreign bodies and the health conditions of the host. There is therefore no ultimate or perfect antibiotic therapy. Treatment should be adjusted according to the results of the cultures collected, if possible [10, 22, 23]. In our study, the type of antibiotic therapy most commonly used was dual therapy (53.7%). The antibiotics most frequently prescribed were amoxicillin + clavulanic acid (73.2%) followed by metronidazole in 56.0% of cases. Our results are similar to those of Peravali et al., who used the combination of amoxicillin + clavulanic acid + metronidazole in 74.1% of cases in their series [4]. However, our results are contrary to those of Ory et al.,

and Barajas et al., who opted for a combination of lincosamide + metronidazole [7, 24].

Surgical management of osteitis involves debridement of all necrotic and/or infected tissue, bone reconstruction or rehabilitation where possible, and repair of damaged soft tissue. The choice of technique (curettage, decortication, sequestrectomy, interrupting bone resection) will depend on the extent of bone damage. Only complete removal of all necrotic or infected tissue, with establishment of adequate blood flow, will lead to effective antibiotic therapy and thus resolution of the infection [7, 17, 23]. In our series, sequestrectomy was the surgical technique most frequently performed, in 36.6% of cases, followed by bone curettage in 29.3% of cases. Notwithstanding the aesthetic and/or functional sequelae in some patients, clinical improvement was observed in 84.6% of cases. This result was comparable to those of Baur et al., and Ory et al., who in their series observed healing with a favourable outcome in 83.3% and 86.7% of cases respectively [7, 11].

CONCLUSION

Dental osteitis of the jaws is a serious condition that is particularly difficult to treat. There are a multitude of therapeutic approaches. The various medical and surgical treatments do not always guarantee a favourable outcome. Patients may suffer significant morbidity due to functional and/or aesthetic sequelae, hence the importance of early specialised or even multidisciplinary treatment.

CONFLICTS OF INTEREST

We declare that we have no conflicts of interest.

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