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Original Article

Odontogenic Peri-Mandibular Cellulitis in Adults : Clinical Profile and Treatment at Owendo University Hospital (CHUO)

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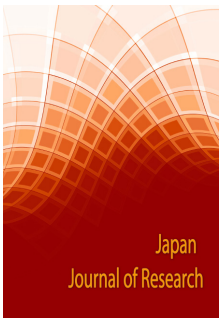

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Keywords

Cellulitis, Peri-mandibular, Odontogenic, Favourable factors, Treatment

Abstract

Introduction: *Odontogenic peri-mandibular cellulitis is a serious, life-threatening infection of the celluloid tissues of the mandible. Our aim is to investigate the clinical and therapeutic profile of odontogenic peri-mandibular cellulitis in adults.*

Materials and methods: *This is a retrospective, descriptive, monocentric study conducted at the Department of Stomatology and Maxillofacial Surgery from 2020 to 2022.*

Patients aged at least 18 years treated for odontogenic circumscribed perimandibular cellulitis were included. The following were excluded: diffuse cellulitis, maxillary cellulitis, records that could not be used.

The following parameters were studied: socio-clinical data (age, sex, habits and lifestyle, factors contributing to cellulitis, consultation time, physical examination, puncture fluid); therapeutic data (treatment method, evolution).

Results: *98 cases were collected, giving a prevalence of 15%. The mean age was 33.3 years. Men accounted for 54% of patients, with a sex ratio of 1.17. 53.1% of patients brushed their teeth once a day. 81.6% of patients were self-medicating with NSAIDs. 57.1% consumed alcohol and 90.8% consumed sweets. 48.0% of patients consulted between D4 and D7 for swelling. 48.0% of patients had submylohyoid cellulitis. 76% had a purulent collection. 60.2% received medical/surgical treatment compared to 39.8% who received medical treatment only. 60.2% of cases benefited from incisional drainage and 73.5% from mechanotherapy. The course was favourable in 83.7% of cases.*

Conclusion: Odontogenic peri-mandibular cellulitis is common and affects young male patients. NSAIDs are the main risk factor and swelling is the main mode of onset. Treatment is medical-surgical with a favourable outcome.

Introduction

Odontogenic peri-mandibular cellulitis is an infection of the cellulo-adipative tissues of the mandible. It is the result of infectious complications of pulpitis or peri-odontal infections [1]. They are serious conditions with a rapid and extensive tendency to become life-threatening. [2]

Cellulitis is a public health problem in Africa. In Senegal, a 2007 study found a prevalence of 1.7% in 5 health facilities in the department of MBACKE et al [3]. However, a study carried out in Côte d'Ivoire in 2020 found a high mortality rate of 13.96% [4]. On the other hand, in France in 2020, the mortality rate associated with cellulitis varied between 0.01% and 0.2% [5].

Peri-mandibular forms of cellulitis are quite common, as shown in a 2012 study by MILOUNDJA et al in Libreville, with a frequency of 59.4% of patients [6]. This peri-mandibular location was also found in 54.6% of patients in a study carried out in Casablanca in 2012 [7]. Peri-mandibular cellulitis most commonly affects young, predominantly male adults.

The positive diagnosis is based on a standard clinical examination, with the patient's history being reviewed for a history of dental pain or fracture, or debilitation. The exo-oral examination focuses on the appearance of the integuments, looking for a swelling, noting its location, limits, appearance, colour and temperature. Clinical observations must be supported radiologically by a panoramic radiograph [8].

Management is urgent and multidisciplinary: medical-surgical, consisting of probabilistic and then adapted antibiotic therapy, accompanied by incision, drainage and must be completed by treatment of the causal tooth [9,10]. The aim of our work is to study the clinical and therapeutic profile of odontogenic peri-mandibular cellulitis in adults.

Patients and methods

WThis is a retrospective, descriptive, monocentric study conducted at the Department of Dental, Oral and Maxillofacial Surgery over

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a 2-year period from 2020 to 2022. Patients aged at least 18 years with circumscribed perimandibular cellulitis of dental origin were included. The following were excluded: diffuse cellulitis, maxillary cellulitis, files that could not be used.

The following parameters were studied: socioclinical data (age, sex, lifestyle and predisposing factors, consultation time, physical examination, puncture fluid); therapeutic data (treatment method, evolution).

The data collected from the medical records, the hospitalisation registers and the operating theatre were recorded on a questionnaire and computerised and modelled using Word, Excel 2010, Épi info and Peaterson's chi 2 test, with a significant P value of less than 0.05 for statistical analysis.

Results

Socio-clinical data

98 cases were reported, giving a prevalence of 15%. The mean age was 33.3 years, ranging from 18 to 71 years (Table 1). Men accounted for 54% of patients, with a sex ratio of 1.17. 53.1% of patients brushed once a day, compared with 46.9% who brushed twice a day. 81.6% of patients were self-medicating with NSAIDs (Figure 1). 57.1% of patients consumed alcohol, 81.6% peanuts and 90.8% sweets (Table 2). 48.0% of patients consulted a physician between D4 and D7 (Table 3). Tumefaction with trismus was seen in 60.3% of cases, tumefaction with fever in 24.4% and toothache with tumefaction in 15.3%. The site of cellulitis was submylohyoid in 48.0% of patients (Table 4). The fluid was purulent in 76% of cases (Figure 2).

Therapeutic data

Treatment was medical-surgical in 60.2% of patients, compared with 39.8% who received medical treatment. Drainage incision was combined with Delbet blade placement (Figure 3) in 60.2% of cases and with mechanotherapy in 73.5% of cases. The course was favourable in 83.7% of cases.

Table 1. *Patient distribution by age group.*

Years	Number (n)	Frequency (%)
18 – 24	22	22,4
24 – 34	37	37,8
34 – 44	24	24,5
44 – 54	7	7,1
54 et plus	8	8,2
Total	98	100

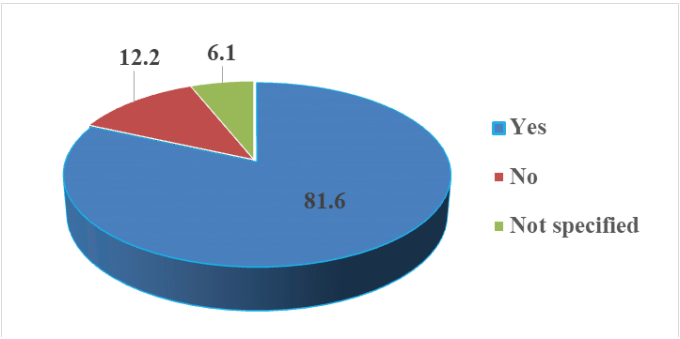

Figure 1. *Distribution of patients by NSAID use.*

Table 2. *Breakdown of workforce by eating habits.*

Eating habits	Number (n=98)	Percentage (%)
Alcohol consumption		
- Yes	56	57,1
- No	42	42,9
Tobacco consumption		
- Yes	18	18,4
- No	71	72,4
- Not specified	9	9,2
Peanut consumption		
- Yes	80	81,6
- No	6	6,1
- Not specified	12	12,2
Consumption of sugar mills		
- Yes	89	90,8
- No	9	9,1
Consumption of cariogenic foods		
- Yes	51	52
- No	47	48

Table 3. *Breakdown of sample size by consultation deadline.*

Consultation time (in days)	Number (n)	Percentage (%)
1-3	26	26,5
4-7	47	48,0
8-14	19	19,4
>14	6	6,1
Total	98	100

Table 4. *Breakdown of workforce by location.*

Location	Number (n)	Frequency (%)
Sub-mylohyoid	47	48,0
Masseterian	24	24,5
Lower Génian	20	20,4
Sus-mylohyoid	4	4,1
Chin strap	3	3,1
Total	**98**	**100**

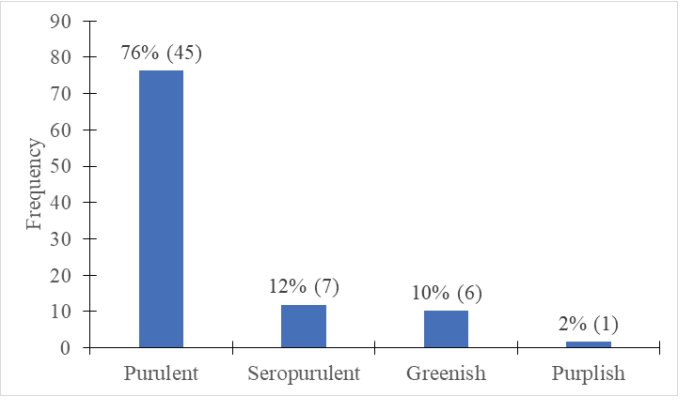

Figure 2. *Distribution of puncture fluid appearance by number of patients.*

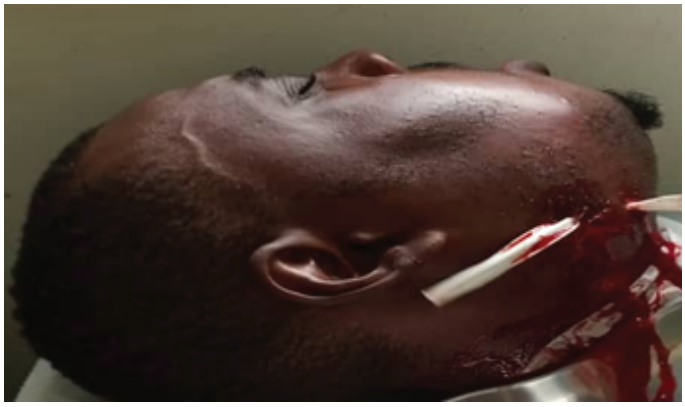

Figure 3. *Drainage of cellulitis (Image CMF Stomatology Department, CHUO).*

Discussion

Socio-clinical data

The prevalence of peri-mandibular cellulitis was 15%. Our result is higher than that of SONFO et al [11], who reported a prevalence of 12.04%, and KAMPO et al [1], 10.67%. This difference can be explained by the lack of awareness of the disease in our population, which often leads to delays in seeking medical attention, resulting in serious complications that can be life-threatening.

Our patients range in age from 18 to 71, with the most common age group being 24-34, with a frequency of 37.8%. Within this age group, women were the most common with a frequency of 42.2%. THIERO et al [12] in MALI find that the 20-30 age group is the most affected, with 31.20% of cases, and NASSIMA et al [13] for the 21-30 age group. This age group corresponds to the beginning of working life, which probably explains why they do not seek oral health care until the disease has become detrimental.

The male sex is represented in 54% of the cases, with a sex ratio of 1.17. Our figures are close to those of SONFO et al [11], who found a male prevalence of 54.67% in their study, and NASSIMA et al [13], who found a male prevalence of 65%. This male predominance can be explained by poor oral hygiene and the predominance of dental caries in men. On the other hand, studies by KAMPO et al [1] in 2021 and THIERO et al [12] in 2013 found 59% and 58.09% of cases respectively in favour of women, which may be explained by the fact that women spend most of their time snacking on sweets.

In our study, 53.1% of patients brushed their teeth once a day, using soft bristle brushes in 42% of cases. Even if this single brushing was done with a hard bristle brush, cellulitis developed in 44% of cases. The study found that 57.1% of patients consumed alcohol. This is in line with the work of NIKITINA O et al [14], who also explain that alcohol destroys the immune system, resulting in neutrophil dysfunction and complement deficiency. The result is a reduction in the humoral and cellular immune response and the body's inability to protect itself. They also showed that consumption led to a reduction in the activity and number of lymphocytes and the phagocytic function of neutrophils (resulting in a reduced immune response). In this study, more than 81.6% of the patients consumed peanut paste, and peanut paste used in spreads is cariogenic.

Many studies have implicated the use of NSAIDs in peri-mandibular and even cervico-facial cellulitis. In our study, 81.6% of the patients used NSAIDs and there was a correlation with the collected stage, showing that the use of NSAIDs favours the occurrence of collected cellulitis. In France, A BENNANI et al [15] found 80% self-medication with NSAIDs and NASSIMA et al [13] found 95%. On the other hand, ANJARIMANANA et al [16] found lower frequencies, with 41.05% taking NSAIDs alone and 31.05% combined with inappropriate antibiotic therapy. Although the rates vary, all authors consider the use of non-steroidal anti-inflammatory drugs as one of the factors contributing to the occurrence of cervico-facial cellulitis. This relationship can be explained by the mechanism of action of NSAIDs on inflammation, which remains primarily a non-specific defence of the body against microbial invasion. NSAIDs block the breakdown of cellular arachidonic acid by the cyclooxygenase pathway, thereby inhibiting the production of thromboxane A2 and prostaglandins, which play an important role in cellular chemotaxis, and slowing the migration and phagocytic activity of polynuclear cells and macrophages. In addition, NSAIDs reduce the initial signs of inflammation, masking these cardinal signs (pain, heat, redness, oedema) and thus exacerbating the infection. For this reason, the US CDC (Centre for Disease Control and Prevention) recommends that NSAIDs should not be prescribed for uncontrolled infections, or if they are prescribed, a systematic evaluation should be carried out within 48 to 72 hours to assess progress [17].

The average consultation time in our study was 4 to 7 days in 48% of cases. SISSOKO et al [13] reported a consultation time of 3 to 7 days in 55% of cases. On the other hand, DIAWARA et al found a delay of 7 to 15 days and NASSIMA et al [13] an average delay of 7 days. This may be explained by the use of self-medication at the beginning of the disease.

The majority of patients (60.3%) were admitted for swelling associated with trismus. Our reason for hospitalisation, although different in one criterion, is similar to that of KAMPO et al, in whom the reason was pain associated with swelling in 59.69% of cases, and SONFO et al, in whom the reason was pain associated with trismus in 68.67% of cases. The absence of pain in our study may be explained by patient self-medication with NSAIDs, which have analgesic properties [17].

The site of cellulitis is submental in 48% of cases. This differs from the work of ROUADI S et al [7] in 2013, who found submental cellulitis in 54.6% of cases. On the other hand, SONFO et al [11] found a lower genital location in 76.67% of cases, as did NIANG P et al [19] in 53% of cases.

Trismus was found in 73.5% of the patients. This contradicts the work of NASSIMA et al [13] who found it in 40% of cases and ROUADI S et al [7] in 37.6% of cases studied. Trismus is an inconstant sign. It is expressed by contraction of the masseter muscles, making it difficult to open the mouth.

The oral condition of most patients was poor in 46% of cases, which is in line with the work of ANJARIMANANA et al [16], who found 42.11% of cases. Cellulitis in the collected stage is the most common diagnosis, with a rate of 60.2% of cases. SONFO et al [11] reported similar results in their study, with a rate of 51.33% of collected cellulitis. The puncture fluid found was purulent in 76% of cases. The purulent nature of the puncture fluid may be related to the habits and culture of the population, who are not in a hurry to consult a doctor but opt for self-medication earlier. This self-medication masks the infectious process, which develops silently until it reaches an advanced stage. When serious signs appear, patients decide to consult the appropriate treatment centre, often at the stage of suppuration.

Therapeutic data

Medico-surgical treatment was noted in 60.2% of cases. All patients benefited from bi-antibiotherapy combined with extraction of the causal tooth. Our therapeutic approach is similar to that of NIANG P et al [19] and YEHOUESSI-VIGNIKIN et al in 2013 [20]. Antibiotic therapy must be effective and targeted, and is initially probabilistic, targeting streptococci and anaerobes, and then adapted to the antibiogram data.

Drainage was performed in all patients in the study, i.e. 60.2% of patients. SONFO et al reported an incision drainage rate of 53.33%. Incision drainage prevented life-threatening complications such as chronic cellulitis.

All patients with trismus underwent in-patient mechanotherapy with cork stoppers, which they maintained with 3 sessions of personal work. This physiotherapy is considered effective because of its satisfactory results and its accessibility.

In our study, 83.7% of patients had a favourable outcome, while the rest progressed to diffuse cellulitis if not treated early.

Conclusion

Odontogenic peri-mandibular cellulitis is common and affects young men with poor oral health. NSAIDs are the main cause and mandibular swelling associated with trismus is the main mode of presentation. Medico-surgical treatment is well codified with a favourable outcome. Treatment of the causal tooth remains the key point in the management of odontogenic cellulitis.

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