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Diffuse perimaxillary cellulitis: etiological, clinical and therapeutic aspects at the University Teaching Hospital of Lubumbashi

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Abstract

Introduction: Diffuse perimaxillary cellulitis (kapopo) can cause life-threatening complications. The objective of this study was to study the etiological, clinical and therapeutic profile of diffuse perimaxillary cellulitis and to assess their prognosis. **Patients and Method:** This is a cross-sectional descriptive study with collection of retrospective data concerning 60 cases collected over a period of five years from January 2016 to December 2020 at the University Teaching Hospital of Lubumbashi. The parameters considered were collected on a three-fold sheet: socio-demographic, clinical and therapeutic. **Results:** The average age of our patients was 30 ± 3.14 years (range: 15 and 80 years), with a clear predominance of women (75%), the sex ratio (F / M) being 3. The average delay of consultation was one month. Our patients came from rural areas (55%) and in 80% of cases they had received traditional treatment before admission. The main aetiology was dental caries (80%) and the lower molars were the starting point in 60% of cases. The clinical focus was mainly acute diffuse perimaxillary swelling in all patients. The pyoculture revealed more staphylococcus (25%) sensitive to cefotaxime. The first-line medical treatment was antibiotics, pain relievers and anti-inflammatory drugs, before considering an incision and drainage. 40% of our patients had a fatal outcome following late management and outcome of complications including mediastinitis, while 60% recovered from their disease after well-followed treatment with unsightly sequelae. **Conclusion:** Diffuse perimaxillary cellulitis of dental origin are potentially serious pathologies requiring early management in hospital settings, hence the imperative need for effective dental prophylaxis through simple prevention measures and health education.

Keywords: Epidemiology, Perimaxillary cellulitis, Treatment, Lubumbashi.

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INTRODUCTION

Diffuse perimaxillary cellulitis is defined by infection of the cellulo-fatty tissues of the face and neck secondary to septic inoculation. These cellulites are characterized by clinical polymorphism. They are sometimes the cause of locoregional and general complications that can be life-threatening [1]. Prompt and adequate management allows the infection to be treated in almost all cases. A multidisciplinary collaboration is often necessary between, maxillofacial surgeon, stomatologist, radiologist, otolaryngologist, endocrinologist and resuscitator [2]. Dental infections are common and represent between 46% and 49% of emergency dental visits [3,4]. Most often dental infections are contained, treated by drainage of the collection and removal of the cause. Complications to be feared are spread of the infection to the airways or vital organs. In our community, this disease called "KAPOPO" is considered in the community as a bad spell cast by wizards and should only be treated with traditional medicine. This worsens the prognosis of patients who often come to consult at the stage of complications. Cellulitis extended to the cervical, cranial or mediatisnal level must be managed in a multidisciplinary manner and especially in collaboration with the resuscitation team. The objective of this study is to study the etiological and clinical profile of dental perimaxillary cellulitis and to assess their therapeutic management.

MATERIALS AND METHODS

This is a descriptive, cross-sectional study with collection of retrospective data concerning 60 cases collected over a period of eight years from January 2011 to December 2020 at the University Teaching Hospital of Lubumbashi. The parameters considered were collected on a three-fold sheet: socio-demographic, clinical and therapeutic.

RESULTS

Socio-demographic data

The mean age of our patients was 30 ± 3.14 years with extremes ranging from 15 to 80 years with a clear predominance of women (75%). The sex ratio (F / M) was 3. The average consultation time was 13 days. Our patients came from rural areas in 71.66% of cases. The majority of the patients (70%) had a low socio-economic level against 30% of the cases which had an average socio-economic level. In our study, 80% of cases had a history of dental caries and treatment with traditional medicine before admission, and in 50% of cases there were associated pathologies: diabetes (30%), hypertension (10%) , HIV (10%) including 4% at the stage of AIDS disease on ARVs. The notion of tobacco and / or alcohol consumption was found in 30% of cases and all patients (n = 60) had taken nonsteroidal anti-inflammatory drugs before their admissions (Table 1).

Clinical data

Apart from bad breath, and a deterioration of the general condition, the clinic was made mainly of an acute perimaxillary swelling in 70% of cases, a diffuse perimaxillary swelling in the thorax in 10 % of cases (Figure 1- A and B), exo-oral swelling in 20% of cases. The other functional signs were made of trismus in 60% of cases, dysphagia in 25% of cases. In 65% of the cases the patients were feverish. In our series, the following clinical forms were found: acute suppurative cellulitis in 60% of cases, acute serous cellulitis in 30% of cases, and in 10% of cases, chronic cellulitis. Our results showed that in 90% of cases (n = 54), it was lower genital cellulitis. The etiology was dental decay (80%), followed by oral trauma (15%) and periodontal disease (5%). The involvement of the lower molars was noted in 70.17% (n = 40) mainly the mandibular first molars with 33.33% (n = 19), followed by the lower premolars in 12.28% (n = 07) of case. (Table 2). In 80% of cases, our patients had received traditional treatment before admission. The bacteriological sample was taken in 40% of cases (n = 24) and was only positive in 50% of cases (n = 12). The organisms isolated were mainly aerobic organisms (66.6%) followed by anaerobes (33.3%). (Table 3)

Therapeutic data

The first-line medical treatment was antibiotics and analgesics for 48 hours for non-fistulized suppurative forms before considering any incision. The antibiotic combination was predominantly made of Cefotaxime + Metronidazole + Fluorquinolone (50%) coupled with mouthwash in all patients. (Table 4). The surgical procedure consisted of the practice of an incision-drainage in 65% (n = 39) of the cases which consisted of a mechanical scalpel incision with evacuation of the pus, debridement, excision of the necrotic tissues and abundant washing with the solution of Dakin and hydrogen peroxide with placement of lamellar drains. Repeated dressings were made. 40% of our patients (n = 24) had a fatal outcome following late management and complications including mediastinitis, while 60% (n = 36) recovered from their disease after well-followed treatment with unsightly after-effects. For our series, 95% of the surviving patients underwent a specialized stomatological examination before discharge and all (100%) followed discharge advice on oral hygiene.

Table 1: Socio-demographic data

Parameters	**Effective(n)**	**Percentage(%)**
Age		
15 – 25	03	5
26 – 35	02	3.33
36 – 45	14	23.33
46 – 55	21	33.33
56 – 65	15	25
66 – 75	01	1.66
76 – 85	04	6.66
Sex	**Effective(n)**	**Percentage(%)**
Male	15	25
Female	45	75
Origin	**Effective(n)**	**Percentage(%)**
Urban	23	38.33
Rural environment	37	71.66
Education	**Effective(n)**	**Percentage(%)**
Primary	17	2.83
Secondary	13	21.66
University	01	1.66
Without	29	48.33
Profession	**Effective(n)**	**Percentage(%)**
Without	48	80
With	12	20
Antecedents	**Effective(n)**	**Percentage(%)**
Diabetes +	26	43.33
High blood pressure+	07	11.66
HIV/AIDS +	10	16.66

Tobacco +	13	21.33
Alcohol +	21	33.33
Tooth decay +	48	80
Taking nonsteroidal anti-infammatory	60	100

Table 2: Distribution of cases according to dental sources

Causal teeth	**Effective (n)**	**Percentages(%)**
1st and 2nd upper premolars	01	1.75
1st and 2nd upper molars	03	5.26
3rd upper molar	02	3.50
1st and lower premolars	07	12.28
1st lower molar	20	35.08
2nd lower molar	11	19.29
3rd lower molar	10	17.54
Lower lacteal molars	03	5.26
Total	**57**	**100**

Table 3: Isolated germs

Aerobic and aerotolerant germs		**Strict anaerobic germs**	
Staphylococci	2	Fusobacterium	5
Non-groupable streptococci	1	Anaerobic streptococci	1
Groupable streptococci	1	Bacterioids	2
Total	**4(33.3)**	**Total**	**8(66.6)**

Table 4: Distribution of patients according to the medical treatment instituted during hospitalization

Medical treatment	**Effective(n)**	**Percentage(%)**
Cefotaxime + Metronidazole	19	31.66
Amoxicillin-clavulanic acid + Metronidazole +Aminoglycoside	11	18.33
Cefotaxime+ Metronidazole + Fluorquinolone	30	50
Mouthwash (gargle)	60	100
Antalgesics (Perfalgan)	60	100

Figure 1: Perimaxillary phlegmons: **(A)** managed by a traditional practitioner having diffused in the thorax, **(B)** admitted at the late stage

Figure 3: Perimaxillary cellulitis following oral trauma in a diabetic

DISCUSSION

Diffuse perimaxillary cellulitis of dental origin is frequent in developing countries, unlike developed countries where it has become exceptional, which explains the paucity of literature on the subject in these countries. This preliminary study has no epidemiological value due to the obvious selection bias and the insufficient number of cases, hence the absence of certain clinical forms. The retrospective nature of this work probably did not always allow the precise identification of the causal tooth and its involvement as well as a rigorous classification of clinical forms (site and mode of evolution).

Socio-demographic data

Age and gender

In our series, the mean age was 30 ± 3.14 years (range: 15 and 80), with a clear predominance of women (75%), the sex ratio (M / F) being 3. For Sami and coll. [4], the mean age was 31 years with a predominance of men. El Abed w *et al*. [2] reported an average age of 34 years, with a slight male predominance, ie a sex ratio of 1.02. Our results are identical to those found by these authors. Although perimaxillary cellulitis is seen at all ages, it most often affects young adults between the ages of 20 and 35. The male predominance is unanimous among several authors [1-6], contrary to the results of our series. We have not found in the literature factors that would expose one sex or another, but we believe that the relatively high level of education among males compared to females in our settings, could explain this exposure of female subjects (lack of sufficient information on oral hygiene).

Consultation time, origin and standard of living of patients

The mean time to consultation in our study was 13 ± 2 days (Extreme: 5-19 days). Our patients came from rural areas in 71.66% of cases (n = 37), with a low socio-economic level in 70% of cases (n = 42), and without a paid profession in 80% of cases (48). For Haitami S. et Coll. [6], the majority of patients were subjects without a profession who could not seek treatment for lack of financial means. In the series of El Abed w. *et al*. [2], The majority of patients (71.8%) had a low socioeconomic level, 20 cases (28.2%) had a medium level. The delay in consultation in our series is justified by the lack of financial means and by the use of traditional medicine given that the origin of this disease is first attributed to witchcraft (locally qualified in greater Katanga in the name of *kapopo*). Self-management of health care by a poor population in front of a health care system devoid of any health insurance, is a factor that contributes to the delay in hospital care forcing the population to resort to self-medication and especially to indigenous treatment.

Co-morbidity factors

In our study, 80% of cases (n = 48) had a history of treatment with traditional medicine before admission, and in 50% of cases (n = 30) there were associated pathologies: diabetes (43.33 %), Hypertension (11.66%), HIV (16.66%) including 4% at the stage of AIDS disease. The notion of tobacco and alcohol consumption was found in 21.33 %% and 33.33% of cases, respectively, and all the patients had taken nonsteroidal anti-inflammatory drugs (NSAIDs) before their admission. The factors favoring cervico-facial cellulitis are numerous: diabetes, alcohol and tobacco poisoning, immunosuppression, taking non-steroidal anti-inflammatory drugs [1]. In the series by Sami Rouadi *et al*. [5], tobacco was the second risk factor found after diabetes. Diabetes is a factor favoring the occurrence of cervicofacial cellulitis of dental origin. All the studies carried out confirm that diabetes is the most common medical history found in patients [5,7,8]. The questioning of non-steroidal anti-inflammatory drugs (NSAIDs) is shared by most of the authors [9,10]. NSAIDs are significantly involved in the speed of diffusion of the infectious process by inhibiting granulocyte function [11,12]. El Abed w. *et al*. [2] reported in their study that 21 patients (29.5%) had various pathological histories of which 50% were diabetic. For Sami R. *et al*. [5], 20% of patients presented with various antecedents: diabetes (10%), tobacco (7.7%), arterial hypertension (3%). In the study by Julien ALDOSA [13], 18 patients were smokers on admission, 45 non-smokers or weaned off, 4 had chronic alcoholism and one patient was addicted to heroin. 20 patients were chronically ill or immunosuppressed.

Clinical data

For our series, apart from a characteristic bad breath, the clinic was made mainly of an acute perimaxillary swelling in 70% of the cases, a diffuse perimaxillary swelling in the thorax in 10% of the cases, a swelling exo-oral in 20% of cases. The other functional signs were made of trismus in 60% of cases, dysphagia in 25% of cases. In 65% of the cases the patients were febrile and 30% presented a deterioration of the general condition. The diagnosis of cervicofacial cellulitis is clinical, it is based on the conjunction of an infectious state and cervicofacial physical signs. Often, a recent history, sometimes still evolving, of dental avulsion, treatment or abscess is found [12]. Sami Rouadi *et al*. [5] had described the same clinical signs in their series in Morocco, as in the series by El Abed *et al*. [2]. In our series, the

following clinical forms were found: acute suppurative cellulitis in 60% of cases, acute serous cellulitis in 30% of cases, and in 10% of cases, chronic cellulitis.

The etiology was dental decay (85%), followed by oral trauma and periodontal disease (15%) (Figure 2). Involvement of the lower molars was noted in 70.17% (n = 40), followed by the lower premolars in 12.28 (n = 07)% of cases. In 65% of cases, they had received traditional treatment before admission. For Paul Débé *et al*., the causal tooth mainly concerned the lower molars and mainly the first ones which represent 26.2% of the implicated teeth; these results correspond not only to ours, but also to data in the literature [15-17]. The susceptibility to caries of the premolars and mandibular molars whose occlusal surfaces have marked grooves and the ease of diffusion of the infection in the cellulo-fatty tissue of the perimaxillary regions explain the frequency of cellulitis in the lower level of the face [16]. The mandibular 1st molar is particularly exposed to caries and its complications due to its size, its morphology (grooves on the occlusal face) and its appearance on the arch at an age when the principles and technique of oral hygiene has not yet been assimilated [16]. In our series, the organisms isolated were mainly anaerobic organisms (66.6%) followed by aerobes (33.3%). The germs involved are variable; most often these are saprophytic germs from the oral cavity. The predominance of anaerobic bacteria is unanimous among the authors [18,19], which corroborates our results which isolated anaerobes in 66.6% of cases.

Therapeutic data

In our series, the first-line medical treatment was antibiotics, and analgesics in all patients for 48 hours for non-fistulized suppurative forms before considering any incision. The antibiotic combination was predominantly made of Cefotaxime + Metronidazole + Fluorquinolone (50%) coupled with mouthwash in all patients. The surgical procedure consisted of the practice of an incision-drainage in 65% (n = 39) of the cases which consisted of a mechanical scalpel incision with evacuation of the pus, debridement, excision of the necrotic tissues and abundant washing with the solution of Dakin and hydrogen peroxide with placement of lamellar drains. Repeated dressings were made. 40% of our patients (n = 24) had a fatal outcome following late management and complications including mediastinitis, while 60% (n = 36) recovered from their disease after well-followed treatment with unsightly after-effects. For our series, 95% of the surviving patients underwent a specialized stomatological examination before discharge and all (100%) followed discharge advice on oral hygiene. Medical treatment is based on targeted and effective antibiotic therapy for severe forms as part of appropriate resuscitation. Therapeutic protocols vary in the literature. For the most part, the reference combination is a triple therapy: Betalactamines (penicillin G at a dose of 6 to 20M IU / 24h by slow intravenous injection), aminoglycosides which have an effective synergistic effect on staphylococcus and on certain gram-negative bacilli (Gentamycin at a dose of 160 mg / 24 h) and Metronidazole reputed to be active on anaerobes at a dose of 1.5 g / 24 h. The dose and duration of treatment depend on the type and course of the cellulitis [18]. Surgical treatment is necessary in the event of suppurative collections or areas of necrosis. The intervention must be as comprehensive as possible and the approach broad and scalable; this involves draining but also excising the necrosis and flattening all the cellulite areas [19]. In the event of associated mediastinitis, drainage by thoracotomy during the same operative step will be considered. Tracheostomy is required in retro-pharyngeal cellulitis because of the risk of these abscesses rupturing during intubation maneuvers [20]. Hyperbaric oxygen therapy has a bacteriostatic effect on anaerobic bacteria but is not commonly used in our settings. Stomatological treatment is most often carried out after cooling of the infectious process. The best treatment remains preventive: antibiotic prophylaxis during dental care, oral hygiene, avoidance of excessive prescription of anti-inflammatory drugs. In the series by Sami Rouadi *et al*. [5], the mortality was zero. They explained this by the fact that the severe cases were hospitalized from the start in the intensive care unit. The various published series find a mortality rate of around 20 to 40% [21]. The 40% mortality rate found in our series is justified by the delay in treatment, this disease being culturally conceived as incurable by modern medicine.

CONCLUSION

Our series allows us to conclude that the perimaxillary cellulitis was mainly odontogenic and that their etiologies were largely dominated by caries of the molars and mandibular premolars; they also seem to confirm, without however demonstrating it, the relationships existing between certain teeth or certain groups of teeth on the one hand, and the mode of evolution and the site of collection on the other. Diffuse perimaxillary cellulitis of dental origin are potentially serious pathologies which have a rapid extensive tendency and can be life-threatening, constituting an inevitable source of high health costs. They require early treatment in a hospital setting, hence the imperative need for effective prophylaxis in dental matters through simple preventive measures and health education. The use of traditional treatment worsens the prognosis by promoting late consultations. The development of antibiotics has made it possible to radically modify the course of these cellulitis, provided that their use is early, appropriate and does not make the etiological treatment forgotten.

Conflicts of interest

None declared.

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