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Epidemiological Aspects of Complications of Cervico-Facial Cellulitis of Dental Origin at the Sominé Dolo Hospital in Mopti from 2021-2022

Théra Thioukany David[1*], Guindo Aly Abdoulaye[1], Koné Mory[1], Fofana Youssouf[2], Diarra Alassane[2], Guindo Oumar[3], Coulibaly Amady[4]

[1]General Surgery Department, Sominé DOLO Hospital, Mopti (Mali)
[2]Medicine Department, Sominé Dolo Hospital, Mopti (Mali)
[3]Public Health Service, Sominé Dolo Hospital, Mopti
[4]Maxillofacial Surgery Department ¬CHU-CNOS, Bamako (Mali)

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***Corresponding author:** Théra Thioukany David
General Surgery Department, Sominé DOLO Hospital, Mopti (Mali)

Abstract **Original Research Article**

Diffuse cervico-facial cellulitis is very common and constitutes a real public health problem in sub-Saharan Africa. They are serious and fatal. The objective of our study was to describe the epidemiology of complications of cervico-facial cellulitis of dental origin at the Sominé Dolo Hospital in Mopti from 2021-2022. We conducted a descriptive cross-sectional study from 2021-2022 on cases of complications of cervico-facial cellulitis of dental origin which were seen in maxillofacial surgery consultation at the Sominé Dolo hospital in Mopti. This hospital is located in Sevaré and is the largest reference center in the 5th region of Mali. During the study period we collected 12 cases of complications of cervico-facial cellulitis out of a total of 33 cellulitis recorded, i.e. a frequency of 36.36%. The average age was 31.83 years. The male gender represented 75% (9 cases), and the sex ratio was 3. Patients who came from rural areas represented 83% of cases and those from urban areas represented 17%. The average consultation time was 21 days. The favoring factors found were: traditional treatment (100%), delay in consultation (100%), use of NSAIDs (33%), HIV immunosuppression (8%), diabetes (8%). The complications found were: purulent pleurisy (33%), loss of skin substance (17%), brain abscess (8.3%), facial venous thrombophlebitis (8.3%), hemoptysis (8 .3%), osteitis of the sternum (8.3%), mediastinitis (8.3%), retroperitoneal abdominal effusion (8.3%). The cytobacteriological examination (ECB) of the pus came back sterile in 42% of cases. The mortality rate was 16.66% (2 cases).

Keywords: complications, cellulite, cervico-facial, Mopti, Mali.

INTRODUCTION

Diffuse cervico-facial cellulitis is very common and constitutes a real public health problem in sub-Saharan Africa. They are serious and fatal [1]. These are infections of the celluloadipose subcutaneous tissue of the face and peripharyngeal spaces [2, 3].

The entry point is most often a dental infection, a subperiosteal abscess forms which spreads secondarily to the cellulose-fat tissues of the face but also to the deep muscular tissues of the upper aerodigestive tracts [3].

Complications occur by diffusion through compartments communicating with each other, in particular via the para-tonsillar space, then with the large anatomical separation spaces which extend from the base of the skull to the mediastinum. This diffusion mechanism explains the complications, not only general, septic but also regional.

The incidence of brain abscesses in developed countries is 0.3 to 0.9 per 100,000 population with mortality ranging from 17% to 37% [4]. There are few studies on the complications of cellulite in Africa.

Bacteria from the oral cavity can spread to the brain and cause life-threatening infections. Natural oral flora is the most common cause of subsequent brain infections, particularly streptococcus species and mixed anaerobes

In addition to these contributing factors, there is also the delay in consultation, most often due to certain cultural beliefs and the poverty of populations in rural areas.

Self-medication and traditional treatment (traditional therapy) remain the rule and routine in our very impoverished environment and are responsible not only for the delay in medical care for all patients, but also for the worsening of the disease.

The objective of our study was to describe the epidemiology of complications of cervico-facial cellulitis of dental origin at the Sominé Dolo Hospital in Mopti from 2021-2022.

PATIENTS AND METHOD

We conducted a descriptive cross-sectional study from 2021–2022 on cases of complications of cervico-facial cellulitis of dental origin which were seen in maxillofacial surgery consultation at the Sominé Dolo hospital in Mopti. This hospital is located in Sevaré and is the largest reference center in the 5th region of Mali. All patients were questioned and examined by a maxillofacial surgeon and additional examinations were carried out (BCN, blood sugar, serum creatinine, transaminases, SRV, TPHA/VDRL, brain scan, ultrasound, chest x-ray)

A case of cellulite complication was defined as the existence of one or more of these clinical and/or paraclinical signs.

❖ **Clinical Signs**

- ✓ Brain abscess preceded by cervico-facial swelling following odontalgia highlighted by the scanner,
- ✓ Facial venous thrombophlebitis preceded by a cervico-facial swelling following odontalgia confirmed by Doppler ultrasound and/or CT angiography,
- ✓ Osteitis of the Sternum preceded by cervico-facial swelling following odontalgia and confirmed by chest x-ray,
- ✓ Pleural effusion preceded by a cervico-facial swelling following odontalgia and confirmed by chest x-ray,
- ✓ Loss of skin substance (ulceration) preceded by a cervico-facial swelling following odontalgia
- ✓ Purulent effusion in the mediastinal cavities preceded by cervico-facial swelling following odontalgia highlighted by chest x-ray and CT scan,
- ✓ Intra-abdominal retroperitoneal effusion without visceral perforation preceded by cervico-facial swelling following odontalgia highlighted by abdominopelvic ultrasound.

Any patient who met the case definition was included.

The data were collected using a standard individual questionnaire developed for this purpose. Our sources of information were the operative report registers, the consultation registers and the patients' medical-surgical files.

The variables studied were:

- Socio-demographic data: age, gender, origin, profession,
- Clinical data: Consultation time, reason for consultation, treatment undertaken, topography, etiology, complication, comorbidity
- Radiographic data: Front/profile chest x-ray, brain scan, abdominopelvic ultrasound and Doppler.
- Biology: CBC, blood sugar, serum creatinine, transaminases, SRV, TPHA/VDRL
- Therapeutic data: The type of treatment, the surgical techniques used.

All included patients gave consent and anonymity was guaranteed. The data were entered and analyzed using Epi info 6.0 VF software.

RESULTS

During the study period we collected 12 cases of complications of cervico-facial cellulitis out of a total of 33 cellulitis recorded, i.e. a frequency of 36.36%. The average age was 31.83 years with extremes of 13 and 52 years. The 16-31 and 32-47 age groups accounted for 42% each

The male sex represented 75% (9 cases), with a sex ratio of 3. Patients who came from rural areas represented 83% of cases and those from urban areas represented 17%.

The patients' professions were distributed as follows: Shepherds (17%), fishermen (25%), farmers (17%), traders (8%), mechanics (8%), housewives (25%).

The average consultation time was 21 days. The favoring factors found were: traditional treatment (100%), delay in consultation (100%), use of NSAIDs (33%), HIV immunosuppression (8%), diabetes (8%). Chest X-ray was performed in 67% of patients, abdominal-pelvic ultrasound in 8%, CT scan in 25% of patients.

The complications found were: purulent pleurisy (33%), loss of skin substance (17%), brain abscess (8.3%), facial venous thrombophlebitis (8.3%), hemoptysis (8 .3%), osteitis of the sternum (8.3%), mediastinitis (8.3%), retroperitoneal abdominal effusion (8.3%).

The cytobacteriological examination (ECB) of the pus came back sterile in 42% of cases. The mortality rate was 16.66% (2 cases).

Drawing

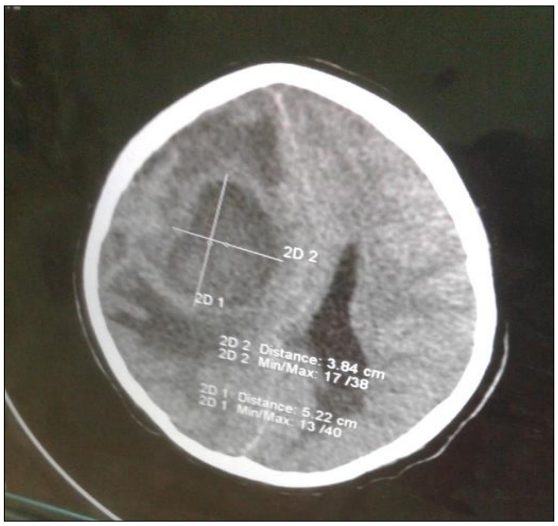

Figure 1: Brain abscess in a 13 year old subject

Figure 2 : Osteitis of the Sternum, 42-year-old man

Figure 3: Drainage Thoracique de pleurésie

Figure 4 : Loss of substance (skin ulcer) way

Figure 5: Epanchement abdominal et scrotal

Painting I: Distribution of patients according to contributing factors

Favoring Factors	Effective	Frequency (%)
Traditional treatment	12	100
Delay in consultation	12	100
Use of NSAIDs	4	33
Immunosuppression/HIV	1	8
Diabetes	1	8

Painting II: Distribution of patients according to the different Complications

Complications	Effective	Frequency (%)
Purulent pleurisy	4	33
Loss of skin substance (ulceration)	2	17
Brain abscess	1	8.3
Facial venous thrombophlebitis	1	8.3
Hemoptysis	1	8.3
Sternal osteitis	1	8.3
Mediastinitis	1	8.3
Retroperitoneal intra-abdominal effusion	1	8.3
Total	12	100

DISCUSSION

To our knowledge, this is the first study carried out on the epidemiology of complications of head and neck cellulitis at the Sominé Dolo hospital in Mopti.

In our study, the proportion of complicated cellulite was 36.36%. This high proportion could be explained by the lack of resources: delay in consultation, use of traditional treatments and self-medication.

In our series, the average age was 31.83 years, comparable to that reported by Ramilison HE *et al*., at the Soavinandriana Antananarivo Hospital Center [5]. This could be explained by the fact that our 2 countries are on the African continent whose population is predominantly young.

The male gender was in the majority, with a sex ratio of 3. A similar sex ratio was reported in the study by Righini CA *et al*., in Grenoble in France [6].

The average consultation time in our study was 21 days. Our patients experienced more delays in consultation compared to those of Sanfo M *et al*., at the Ouahigouya regional hospital in Burkina Faso who found an average consultation time of 13 days [1].

The favoring factors found were: traditional treatment (100%), delay in consultation (100%), use of NSAIDs (33%), HIV immunosuppression (8%), diabetes (8%). The main contributing factor reported by Miloundja J *et al*., in Libreville, Gabon, was self-medication with anti-inflammatories [7].

The complications found in our study were purulent pleurisy in 33%. Several studies have reported cases of pleurisy secondary to head and neck cellulitis [1-10]. It occurs by diffusion following the pre-tracheal, perivascular and parapharyngeal space. The continuity of the pre-tracheal fascia, the pericardium and the parietal pleura explains potentially fatal pericardial damage (tamponade), purulent pleurisy or pleural empyema [6-11]. This pleural damage is linked to the propagation of germs downwards by gravity and to negative infra-thoracic pressure.

Our patients benefited from multidisciplinary care (chest drainage carried out by general surgeons, dental extractions by dental surgeons and respiratory physiotherapy by physiotherapists).

Loss of skin substance complicating cervico-facial cellulitis was observed in our patients in 17%. Previous studies have reported similar cases of skin loss [9-12]. The pathogenesis of necrotizing fasciitis begins with liquefaction of the subcutaneous cellular tissue with disintegration of the fascia planes, followed by venous thrombosis, infiltration of inflammatory cells and skin necrosis.

To cover a skin defect (PDS), plastic surgery has 4 basic methods which are, in order of increasing complexity: directed healing, suturing, grafts and flaps [13, 14]. This is consistent with the therapeutic attitude achieved in our patients who were successfully treated with directed healing after necrosectomy and honey dressings.

Brain abscess was found in 1 case (8.3%) in a 13-year-old girl, tooth no. 26 was involved. Operated by the Neurosurgeon within 4 hours following the scan diagnosis with recovery of speech within 48 hours and gradual recovery of the paralyzed limbs. Several studies have shown that the main etiology of brain abscesses is the spread of a contiguous infection with 12% of all brain abscesses being caused by dental etiologies [4-16]. It occurs by tissue necrosis followed by the production of pus, a capsule forms around it and cerebral edema results [16, 17].

In our series, 1 case of facial venous thrombophlebitis was recorded (8.3%). This is a rare complication [18], and the same observation was made by Ouattara *et al*., who found a low frequency in their study [19] . This patient was admitted to an impaired consciousness unit (Glasgow=9/15) in whom type 2 HIV was detected and he died on the 3rd day of hospitalization.

In our series, one (1) case of mediastinitis was recorded in a young subject, from whom streptococcus intermedius was isolated. In Grenoble in France, group A hemolytic β streptococcus and Prevotella were the two germs most frequently isolated in the study by Righini *et al*., [6]. The frequency would vary depending on the consultation time, the socio-economic level of the patient and the diagnostic stage [10]. According to the authors, Computed Tomography (CT) is the key diagnostic examination [1-23].

Retropharyngeal abscesses more readily give rise to infections of the posterior mediastinal space [6-25]. We recorded 1 case of hemoptysis following cervico-facial cellulitis with thoracic extension. This diabetic patient died from severe hemorrhage.

We observed 1 case of retroperitoneal abdominal effusion in our study with a 42-year-old farmer. Multidisciplinary management including (percutaneous drainage of the retro abdominal effusion carried out by the urological surgeon, extraction of the causal teeth by the dental surgeons, feeding was by nasogastric tube). Abdominal retroperitoneal effusion complicating cellulitis of dental origin is very rare. The mortality rate was 16.66% and the responsible complications were thrombophlebitis and hemoptysis.

CONCLUSION

Head and neck cellulitis are serious conditions whose complications endanger the vital prognosis of patients in the short or medium term. Hence the need for early diagnosis and treatment to minimize the occurrence of serious complications. The low socio-economic level and certain cultural beliefs in rural areas contribute to the delay in consultation.

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