

Case Report

## Cervical Necrotizing Fasciitis of Dental Origine: A Case Report and Review

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### Abstract

Cervical necrotising fasciitis constitutes an infectious emergency whose the starting point is located in the oral cavity or the pharynx with a direct infection of the cervical region by transmucosal way. The progression of the infection can be towards the mediastinum with the development of a life-threatening necrotising mediastinitis. The diagnosis is mainly clinical, the radiographic evaluation are particularly useful for assessing the extent of damage .In most cases, it is mixed polymicrobial infections. The therapeutic management is a medical and surgical that has several components. We report a case of very extensive cervical cellulitis related to a neglected dental abscess that has evolved under antibiotic therapy, surgical drainage and intensive daily care.

### Introduction

Cervical necrotising fasciitis is a bacterial infection of skin and hypodermis necrosis accompanied with involvement of the superficial fascia. This is a serious infection, fatal in 30% of cases and most often complicating a dental infection or oropharyngeal aero and anaerobic germs spreading by contiguity to the neck and mediastinum [1,2, 3,4 ] .We report a case of very extensive cervical cellulitis related to a neglected dental abscess that has evolved under antibiotic therapy with intensive daily care.

### Case report

Mr. XY aged 59 years ago, poor controled type II diabetic was admitted to the emergency unit for a left lateral cervical swelling lasting for two weeks with fever, he was under antibiotic treatment (macrolide) and anti inflammatory drug for one week for a dental abscess. On admission, he was in severe sepsis with a temperature at 38 ° C, blood pressure 91 / 41mmHg, tachycardia at 121 pulses per minute, polypnea to 24 cycles per minute and a saturation of 91% in air ambient. Clinical examination revealed swelling of the left lateral region

of the neck and inflammation with crackles extended to the whole cervical region also taking the anterior chest (Figure 1).



**Figure 1.** Clinical view at admission: massive left lateral cervical swelling.



**Figure 2.** CT scan showing voluminous collection of the left cervical region.

The examination of the oral cavity noted poor oral hygiene and the decayed left mandibular third molar with periapical infection. Moreover, the biological assessment was a glucose 3.59 g / l and glycated hemoglobin A1c to 8.5%. CRP was 163 mg / l, the white blood cells: 15300 cells / mm<sup>3</sup> with 83% neutrophils plus a functional renal failure with urea at 0.61 g / l and serum creatinine at 19 mg / l. CT chest neck objectifying a voluminous collection of the left cervical region with air bubbles,

driving back the trachea and the vessels of the neck (Figure 2). Under general anesthesia, a cervicotomy with a large incision was necessary to drain pus and excised areas of necrosis. The tooth in question was extracted and Delbet blades were left in place without skin closure (Figure 3). Bacteriological samples taken intraoperatively find a *Streptococcus pyogenes* and *Staphylococcus* species sensitive to antibiotics prescribed in the admission: amoxicillin-clavulanic acid 1 g / 6 h, an imidazole 500mg / 8h and aminoglycosidic gentamicin to 240 mg / 24h. The treatments continued daily in deep sedation and consisted of abundant washes with saline, hydrogen peroxide and betadine. The withdrawal of Delbet blades were retired gradually over the care. The outcome was favorable and skin closure was carried out towards the end of the 3rd week with good healing.



**Figure 3.** Large cervical incision for drainage.

## Discussion

Necrotising fasciitis is an infectious emergency originating from an infection of the oral cavity or the pharynx, with direct infection of the cervical region by transmucosal way, unlike the lymphatic or blood way infections spread. The progression of the infection can be towards the mediastinum, with the development of necrotising life-threatening mediastinitis [5,6]. Factors favoring the development of necrotising fasciitis were identified: age (children and elderly), obesity, alcoholism, smoking, active cancer, kidney and liver failure, the presence of reach skin and immunosuppression (diabetes, AIDS). The role of non-steroidal anti-inflammatory drugs (NSAIDs) in triggering necrotising cellulitis remains controversial. In many publications, the authors suggest that NSAIDs favor the occurrence of necrotising fasciitis, either by masking the first signs of infection or by promoting microbial growth [7,8,9].

The clinical course of maxillofacial diffuse cellulitis occurs in three phases: serous, collected and diffuse. The time required for cervical infection to progress into the thorax is very variable. In some cases, it's need only few hours; these are forms of "fulminant" infection are very rare. In most cases, it takes few days, probably due to the intake of antibiotics and / or anti-inflammatory in early stage of infection, masking clinical signs [10]. Serous cellulitis is the initial stage of any cellulitis. The clinical signs are predominantly local with edema and skin over which is tense and red. This facial swelling is painful on palpation but is not mobile relative to a deeper level. It follows a toothache or may accompany it, the general signs are absent. In the absence of appropriate treatment, its evolution will be to suppuration. With early etiological treatment, symptoms regress in 48 to 72 hours. The collected cellulitis appears most often the course of a serous cellulitis. The pain is most important and pulsatile. Trismus can be present depending on the location of the causal tooth. General signs appear: moderate fever, asthenia. Clinically, the skin is red, tense, shiny and elevated local temperature. The palpation shows more limited swelling, fluctuation can be perceived with bidigital palpation. Oral examination is essential to find the causal tooth with buccal swelling and to research an associated edema of oral floor. The healing of the cellulitis will take place only after surgical drainage of the collection, treatment of the causal tooth and antibiotics. Spontaneously, the cellulitis can become chronic with formation of cutaneous sinus tract, but in the absence of treatment, the risk is the migration of this collection to neighboring areas, leading to a diffuse cellulitis. The diffuse cellulitis is characterized by a rapid spread of infection with significant tissue necrosis. The symptoms are intense associated with significant systemic symptoms, sometimes with a septic shock. Locally there is a very painful swelling with indurated skin and sometimes necrosis. Subcutaneous crepitation can be found. This type of cellulitis is by definition very quickly extensive, reaching adjacent anatomical regions with a significant risk of mediastinitis. A severe trismus is often present. Surgical drainage of these lesions shows necrotic tissue without significant pus. [1] The diagnosis is mainly clinical and radiological studies are particularly interesting to assess the extent of damage. In fact, the simple chest X-ray is less effective. Pneumomediastinum sign the most suggestive of mediastinal involvement should be suspected in the presence of the following indirect signs widened mediastinum, double contour image of the left edge of Coeuret / or aortic button or diaphragmatic continuous line. Pneumothorax, pneumopericardium, parenchymal infiltrates, pleural effusion are highly suggestive, but very difficult to identify on radiographs made in emergencies, and mostly in bedridden patients, so often of poor quality. Radiological examination of choice is neck and chest enhanced CT. In the chest, this is a particularly sensitive test to detect mediastinal infectious disease. It allows to specify the affected anatomical areas and detect a pleural or pericardial extension to cavities. Depending on these factors, the CT allows the choice of thoracic

surgical approach. The diagnosis of mediastinitis on CT is based on the presence of one or more of the following: mediastinal widening, adenomegalies, hypodensity of mediastinal fat, air bubbles, watery zones (abscess), venous thrombosis, uni- or bilateral pleural effusion, pericardial effusion [11,12,13]. In most cases, it is polymicrobial infections aeroanaerobically mixed flora. Conventional aerobic bacteria are found: *Streptococcus pyogenes* (Group A streptococcus), *Staphylococcus aureus*, *Enterobacteriaceae*, enterococci, streptococci, *Pseudomonas aeruginosa* (often immunocompromised). Anaerobic bacteria are also conventional: *Clostridium* sp., *Peptostreptococcus* sp., *Prevotella* and *Porphyromonas* sp., *Bacteroides* sp., *Fusobacterium* sp. Thoracic, head and neck infection of dental origin is dominated by anaerobic bacteria [11, 14,15].

Necrotizing fasciitis is a medical and surgical emergency with several components: The resuscitation with monitoring and stabilization of hemodynamic and respiratory status, the treatment of a severe sepsis which combines the correction of hypovolemia and the possible use of vasoactive amines and maintaining optimal oxygenation using mechanical ventilation if necessary. [16] Control of the upper airway can be a potential problem. Thus, the choice of anesthetic technique is strongly guided by the risk of the difficulty to place the face mask ventilation and the necessity of maintaining spontaneous ventilation to reduce the risk of hypoxemia during tracheal intubation. The technique of choice for airway control is the bronchial fibroscopy [17]. Probabilistic antibiotic started at admission is essential but not sufficient without surgery. It has a reduced efficiency because of the local severity of the infection and of the state of patients. His interest is limited in areas highly affected because of lack of local antibiotic diffusion, however, it can limit the spread of infection to healthy peripheral areas and hematogenous spread. In head and neck Necrotizing fasciitis we target in particular streptococci (group A) and anaerobic (often sensitive to beta-lactams). The combination comprises penicillin G at a dose of 30 MU / day (or amoxicillin 100 mg / kg per day) and clindamycin at a dose of 600 mg four times a day or rifampicin 10 mg / kg twice daily. 2 g of Amoxicillin-clavulanic acid three times per day associated with high-dose gentamicin 6 to 8 mg / kg daily [15]. the causal tooth is extracted at the time of debridement under general anesthesia. Further treatment of the oral cavity is sometimes necessary in order to prevent any similar infectious episode. [1]

The initial surgery, whose precocity is a key prognostic factor, consists of a wide drainage of collection under general anesthesia. The Drainage is intraoral sometimes transcervical, which allow the realization of antiseptic washes many times per day. The surgical management of gangrenous cellulitis justifies the multiple drainages especially cervical and oral and excision of all necrotic tissue. Several surgical revisions may be required, the first washings are performed best under general anesthesia. If mediastinitis associated with an

extension below the tracheal bifurcation, a double team management with a thoracotomy is justified [5]. The value of hyperbaric oxygen therapy is controversial .it seems be beneficial in animals in combination with surgery and antibiotics, no prospective human studies has been performed. It would eventually be indicated in patients with documented Clostridium infection. In any case, it must not performed before surgery and initiation of appropriate antibiotic therapy [18,19].

## Conclusion

Cervical necrotizing fasciitis is a mixed infectious emergency. The extension of the infection is done by transmucosal contiguity with extreme gravity when it reaches the mediastinum. The functional/ vital prognosis depends on early diagnosis, quality of surgery, associated pathology and the resistance of the isolated strains.

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