



Short communication

Cervical necrotizing fasciitis of odontogenic origin involving the temporal region – A case report

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ABSTRACT

Necrotizing fasciitis (NF) is a soft-tissue infection, usually polymicrobial, that causes necrosis of fascia and subcutaneous tissue while sparing skin and muscle. We report a case of cervical NF complicating dental infection in a 50-year-old woman, who presented with infection involving mucosa of the right mandible and temporal muscle, and masticator spaces, requiring extensive surgery and antibiotic therapy. Prompt diagnosis and immediate aggressive surgical debridement of all compromised tissues are critical to reducing morbidity and mortality in these rapidly progressive infections.

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1. Introduction

Necrotizing fasciitis (NF) is a rare, usually multimicrobial, infection of the deep dermis and subcutaneous tissues, characterized by rapid invasion of soft connective tissue (Jones, 1871). Spread of the infection may also involve muscle layers, resulting in oedema, massive lymphocytic infiltration and vascular thrombosis that may develop into necrosis of subcutaneous tissues, causing septic shock and kidney, liver or heart failure. The most frequent pathogens are *Streptococcus hemolyticus* β group A, *Staphylococcus aureus*, Enterobacteriaceae, *Clostridium* and *Salmonella* (Fenton et al., 2004). Cervical NF may arise in the oropharyngeal or buccal region, typically from odontogenic sepsis. If not treated at once with appropriate drugs or surgery, it may spread through the bone marrow and cortex, reaching muscle layers, fascial spaces and thence various vital organs. Aggressive forms are often the result of underestimation of the infection, late diagnosis, erroneous surgical approach and septic complications (Cunningham et al., 2001). The mortality rate is 6–13% (Rubinstien et al., 1995; Jarrett et al., 1997; Tung-Yiu et al., 2000; Whitesides et al., 2000). The affected site is usually very painful; the skin is hot, red and swollen, later possibly turning purplish red and developing bullae, crepitation and dermal

gangrene. Fever is almost invariably present and accompanied by systemic toxicity with tachycardia and mental confusion.

2. Case report

The 50-year-old woman was referred to the Dentistry Department of Siena University Hospital with a 1 week history of swelling and trismus of the right side of the mandible involving the cervical region, which was painful to palpation. Medical history included ovarian carcinoma and Hepatitis C Virus (HCV) infection. The patient had been on ampicillin for about 10 days without improvement.

Treatment was changed to i.m. ceftriaxone (2 g/day) and methylprednisolone (16 mg/day) with follow-up the next day to assess the patient's general condition, by which time her condition had worsened (temperature 39 °C, dyspnoea, dysphagia, foreign body sensation, sensory loss; Fig. 1). She was immediately admitted to the ENT Department. Full blood count showed high neutrophilic leucocyte count (white blood cell (WBC) $26.05 \times 1000/\text{mm}^3$, neutrophilic granulocytes 90.8%), an elevated erythrocyte sedimentation rate of 74 mm/h, an elevated C reactive protein (20.78 mm/dl) with glucose 143 mg/dl. Parenteral broad-spectrum antibiotic therapy was begun with sulbactam and ampicillin 9 g/day, metronidazole 1.5 g/day, teicoplanin 800 mg/day, methylprednisolone 40 mg/day, ciprofloxacin 400 mg/day and imipenem 1.5 g/day. The advice of a diabetologist was also sought.

Orthopantomography and computerized tomography of the neck and chest with and without contrast medium were performed

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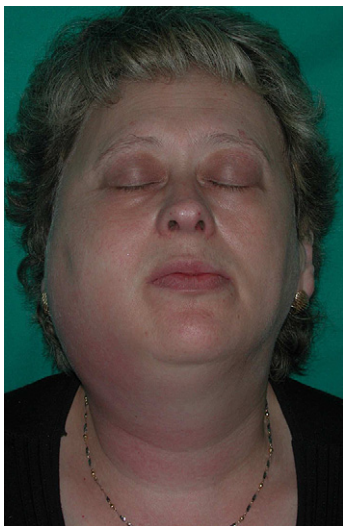


Fig. 1. Swelling of right jaw with typical signs of fasciitis.



Fig. 2. Dental X-ray.

immediately. The former showed caries of 4.8, 4.7 and 4.5 (Fig. 2). Computed tomography (CT) showed an extensive right laterocervical abscess invading the parapharyngeal and submandibular masticatory spaces as far as a plane passing through the hyoid bone, surrounding the ramus of the mandible, displacing the pharynx contralaterally. Diffuse oedema of neighbouring soft tissue and the right wall of the pharynx, lymphadenopathy, and slight reactive sclerosis of the ramus at the right mandibular angle were noted. The patient also had slight pleural effusion on the right associated with commensurate breathing difficulty. Mediastinal accumulation was excluded. After careful evaluation it was decided to drain the abscess surgically.

The operation was conducted in two stages. The first consisted in extraction of the three carious teeth and removal of purulent material. The second consisted of right lateral cervicotomy according to Morestin, performed by the ENT surgeons, which revealed infiltrated, swollen and necrotic tissue. There was thrombosis of the facial vein and the external and internal jugular veins. Exploration of the cervical area (level 2) led to release of 300 ml of purulent material. A sample of the pus was cultured. The area was cleaned and partially sutured, applying medicated gauze dressing. Because of the patient's poor general condition, she was admitted to intensive care where serial samples were obtained for microbiological examination. Since the cultures produced *Staphylococcus epidermidis*, *Candida albicans* and *Klebsiella oxytoca*, fluconazole (400 mg/day followed by 200 mg/day) was added to therapy. Daily medication of the surgical wound with bicarbonate and topical rifampicin was carried out during intensive care (Fig. 3).

Three days after surgery, CT of the neck and head showed slight cerebral oedema, an abscess in the right submandibular region, and inflammation of soft tissues extending to the external pterigoid muscle. Thickening of the right sternomastoid muscle and bilateral pleural effusions were seen. There were no mediastinal accumulations.

A second surgical operation through the previous access enabled removal of the right submandibular gland. An abscess under the mylohyoid muscle was drained of pus which was sent for culture and sensitivity. The ENT team performed a tracheotomy and the patient was out on assisted ventilation. Culture confirmed the presence of the previously listed pathogens but with a large increase in colonies of *Candida albicans* (100,000 ufc/ml). After repeated medication, the surgical wound improved markedly and

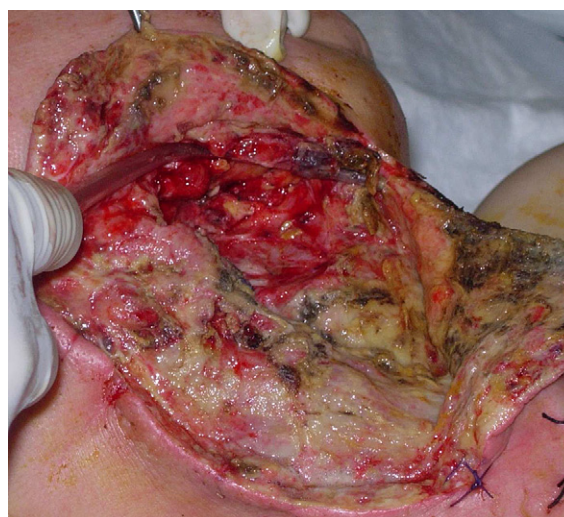


Fig. 3. Evidence of necrotic sternomastoid muscle tissue.

necrosis reduced in the area. Two days after the operation CT revealed an accumulation of pus/liquid in the right temporoparietal region and a small fistula between the right zygomatic fossa and the ramus of the mandible on the same side (Fig. 4). The abscess was drained and the temporal muscle, which was necrotic and purulent, was partially removed (Fig. 5, cervical exploration to the coronoid process via the internal face of the ramus). After an episode of deep venous thrombosis during intensive care, heparinoids were added to therapy.

Forty-eight hours after drainage of the temporal abscess, CT of the neck, chest and head showed a reduction of inflammation and of subcutaneous oedema in the cervical region. The patient's clinical condition gradually began to improve. The surgical wound was then sutured, sedation reduced and assisted ventilation suspended. After 27 days of intensive care, the patient was returned to the ENT ward. Clinical examination showed remission of craniocervical inflammation. There was functional deficit of right cranial nerves IX–XII with moderate dysphagia, especially for liquids, and dysphonia. At 32 days, the tracheotomy was closed. At 40 days, the patient was discharged from hospital.

The patient underwent rehabilitation of swallowing and speech to improve contralateral laryngeal compensation. At 6 months, she was in good health and dysphagia and dysphonia had improved considerably, though deficit of the last four cranial nerves persisted.

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