CERVICAL NECROTIZING FASCITIS: A RARE COMPLICATION ON ODONTOGENIC INFECTION – A CASE REPORT

Kende PP1*, Chavan AJ1, Gaikwad RP2, Yuwanati M3
1. Department of Oral and Maxillofacial surgery, Government Dental College and Hospital, Mumbai, India
2. Department of Periodontology and Implantology, Government Dental College and Hospital, Mumbai, India
3. Department of Oral pathology and Microbiology, Government Dental College and Hospital, Mumbai, India

Correspondence
Dr. Prajwalit Kende. Department of Oral and Maxillofacial surgery, Government Dental College and Hospital, Mumbai, India
Email: prajwalit_kende@rediffmail.com


ABSTRACT

Necrotizing fasciitis is a rapidly spreading soft tissue polymicrobial infection characteristic by necrosis of the subcutaneous tissue and superficial fascia. Odontogenic infection originates in the tooth proper or in tissue that closely surrounds it, and then spread through path of least resistance. When its origin is an odontogenic infection, most cases resulted from an abscessed mandibular molar. Left unchecked this infection invariably leads to systemic toxicity, multi-system organ failure and eventual death. Early diagnosis and surgical interventions involving aggressive and frequent debridement with proper antibiotic and supportive care are essential for limiting morbidity and mortality. Case presentation: A case of cervical necrotizing fasciitis in 52 years old female with severe swelling on right side of face developed due to untreated carious lower tooth. Patient was operated upon with proper surgical treatment. In conclusion, this case shows how tooth decay may lead to development of unsuspected severe complication like Cervical necrotizing fasciitis. The professional should be aware of the early endodontic treatment importance, because when left unchecked, it might lead to an infection of the deep spaces of face and neck, or to cervical necrotizing fasciitis in patients with certain risk factors.

Key words: Odontogenic infection, cervical necrotizing fasciitis

INTRODUCTION

Necrotizing fasciitis (NF) is a rare acute infections characterized by rapidly progressive necrosis of subcutaneous tissue and fascia with a high morbidity and mortality rate. Necrotizing fasciitis was first described in 1848 and first recognized by Meleney in 1920. Wilson coined the term necrotizing fasciitis in 1952. Patients with immune compromised status like diabetes mellitus, cancer, alcoholism, vascular insufficiencies, organ transplants, HIV, or neutropenia are more prone to this type of infection. Necrotizing fasciitis following the dental infection is extremely rare with very few reported cases in the literature. They require aggressive treatment to combat the
associated high morbidity and mortality. These infections can be difficult to recognize in their early stages, but they rapidly progress. The intent of this article is to highlight the clinical presentation, management and review of literature of cervical necrotizing fasciitis (CNF) which will be of help for early diagnosis and treatment.

**CASE REPORT**

A 52 years old female was referred to the department of maxillofacial and oral surgery from the outpatient department with history of severe pain and swelling of the right side of face and chin since 5 days. She also disclosed history of pain in right lower posterior region with trismus. The patient gave history of pain in the same tooth on and off in the past one year. She didn’t revealed any positive medical, family, personal and drug/allergy history. On general examination the patient was febrile with other vital parameter in normal level. She was very ill looking and toxic. Extra orally, there was asymmetry of face with swelling of 3 X 4 cm on the right side of face extending from inferior border of mandible to the mid chin area (Figure 1). The swelling was tender, hard with raised local temperature. Intraorally the patient oral hygiene was poor with raised floor of mouth and tender carious #46.

Figure 1. Swelling over right side of face.

The patient was admitted to ward and imperial intravenous antibiotics and fluid therapy started. Routine blood investigation with radiological examination was done immediately. There was leucocytosis, raised polymorphs, raised ESR and lateral neck radiograph showing slight compression of trachea.

The patient was posted in emergency for incision and drainage and extraction of # 46 was carried under local anesthesia. Under all aseptic precautions, the swelling was drained by using Laskin technique. There was no discharge of pus. The offending tooth was extracted. Two drains were inserted. The patient tolerated the surgery well.
She was given high dosage of ampicillin and metronidazole. However, the painful erythema spread.

Figure 2. Radiograph showing carious # 46.

Figure 3. After incision and drainage on 3rd showing necrosis of skin on the right side of neck.

Figure 4. Postoperatively after 7th days of through local regular dressing.
throughout the neck with further swelling developing low in neck. On the 3rd day, following the initial incision and drainage and area of necrosis appeared on the skin of the right side of neck. She became very toxic with high fever. The skin color surrounding the area of necrosis was dusky red with poorly defined margin. Cefotaxim was added to the antibiotic regime. The following day the patient was taken up for surgery under general anesthesia where the necrotic tissue was debrided with some part of skin fat and muscle which were all gray or black and foul. The wound was irrigated with hydrogen peroxide, betadine, povodindodine and dressed with gauze packs soaked in EUSOL. These dressing were changed thrice daily. 3 days after the debridement the wound started to heal. After 15 days of continuous dressing and antibiotic therapy the patient responded on positive side. The wound healed leaving the scar behind.

DISCUSSION

Necrotizing fasciitis of the head and neck region is uncommon⁴. In a large series of 128 cases of necrotizing fasciitis, only five of them involved the head and neck region⁵. The severity of necrotizing fasciitis depends on the etiology, anatomical site, and depth of tissue involvement, bacteriology and general condition of the patient. Low immunity plays an important role in determining the initiation, progression and outcome of the disease. The most frequent source of infection for necrotizing fasciitis involving the head and neck region are the teeth or pharynx. Periapical infection of the second or third molar is the usual culprit for cervicofacial infection. This is because the roots of these molars extend below the insertion of the mylohyoid muscle, which is connected to the submandibular space⁶. Other sources include the ear, lymph node, cutaneous infection or extension of infection from adjacent structures. Once the infection has involved the soft tissues, the spread of the disease subsequently follows the fascial planes. The greatest clinical importance of the cervical fascia is that it divides the neck into potential
spaces and involves a number of adjoining areas. Although this infection primarily involves the superficial space, other fascial spaces may be involved depending on the stage of the disease and the portal of entry. The parapharyngeal space communicates with all the major fascial spaces. Thus, it may be involved with infection via direct spread from another space or vice versa. Any delay in the treatment of necrotizing fasciitis of the parapharyngeal spaces will expedite the spread of infection to dangerous spaces and subsequently to the mediastinum inferiorly, causing potentially lethal mediastinitis.

Cervical necrotizing fasciitis was defined by Monreland et al.\(^7\) and modified later to include infections beyond the submandibular space as follows: (A) inflammation in the submandibular space, with little or no suppuration and with spread to the neck beyond the level of the hyoid bone; (B) involvement of more than one neck space, usually bilateral; (C) tissue necrosis with serosanguineous, putrid infiltration; (D) involvement of connective tissue and fasciae and secondary in muscles and skin, but not of glandular structures; and (E) contiguous—not lymphatic—spread.

The most common clinical presentations are painful edema, erythema, warmth, tenderness, crepitation, and submandibular abscess. Patients can develop mediastinitis and consequent septic shock. In the present case, the source of infection was dental carries/periapical infection. Submandibular space infections spread readily beneath the anterior belly of the digastic muscles to involve the adjacent spaces, such as the sublingual and submental.

In our case also lower molar tooth was extracted. NF usually starts with local inflammation and fever that advances rapidly along the fascial planes resulting in extensive tissue necrosis and skin changes over 24-48 hours hence lymphangitis and lymphadenitis are usually absent. Thrombosis of the cutaneous vessels leads to cutaneous ischemia, tissue gangrene, necrosis and sloughing. Presence of vesiculation, ecchymosis, crepitus, anesthesia and necrosis are indicative of advance disease.\(^8\) Our case progressed to necrotic stage but without any organ dysfunction which is common for most of the cases.

The pathological changes of NF include thrombosis of blood vessels, suppuration and necrosis of the superficial fascia with subcutaneous fat.\(^9\) Although many underlying disease processes predispose patients to NF, three common factors are invariably present: (a) impairment of immune system (e.g., diabetes mellitus, malignancy, alcoholism); (b) compromise of the fascial blood vessels; and (c) the presence of microorganisms that are able to proliferate within this area.\(^10\) The pathological mechanism of NF is not fully understood. However, bacterial proteolytic enzymes, such as collagenases and hyaluronidases, may lead to the rapid spread of the infection and necrosis along the tissue planes. In addition, proteolytic compounds in the cell walls of bacteria may combine with collagen to promote tissue necrosis.\(^11\) The pathogenic process can also induce local thrombosis which results in ischemic necrosis of overlying structures such as the subcutaneous fascia and skin. Penetration of antibiotic into ischemic and necrotic tissue is poor and thus antibiotic treatment of conditions such as NF is ineffective without surgery.\(^12\)

The divisions and subdivisions of the deep cervical fasciae determine the limits and the spread of the infectious process. Nevertheless, it is difficult to detect this infection before it has spread to the deep fasciae, when complications are more frequent. Complications of cervical necrotizing fasciitis include airway obstruction, pneumonia, pulmonary abscess, septic shock, jugular venous thrombophlebitis, and mediastinitis. In order to exclude the cervical necrotizing fasciitis diagnosis, x-ray of the affected area must reveal an absence of gas in the soft tissue. CT scan has been advocated for detecting gas, identifying the spread of infection in vascular sheaths, and detecting the extension of infection to remote areas.\(^13\)
Once the diagnosis is made, treatment must not be delayed. Regarding NF of odontogenic origin, there are 4 factors that contribute significantly to morbidity and mortality: delayed treatment due to difficulty in recognizing the condition; inappropriate treatment; host debilitation; and the presence of a polymicrobial infection. The cornerstone of treatment is surgical debridement. All necrotic tissue must be removed until healthy bleeding tissue is encountered. Reluctance to debride facial soft tissues aggressively and avoid unsightly disfigurement often leads to under treatment of the disease early in its course. Multiple surgical debridement’s in the operating room are usually needed. In addition to surgery, other treatment modalities include antibiotics and supportive care. Even though many adjunctive treatments such as maggots, hyperbaric oxygen treatment, intravenous immunoglobulin and plasmapheresis have been reported to be helpful, early diagnosis, broad-spectrum antibiotics and prompt and adequate surgical debridement are the keys to successful treatment.

CONCLUSION

The extraction of carious tooth is a normal clinical procedure made by the general dentist. The professional should be aware of its early treatment importance, because when left unchecked, it might lead to an infection of the deep spaces of face and neck, or to cervical NF in patients with certain risk factors. This infection invariably leads to severe complication with unsuspected death. The early diagnosis of cervical NF with aggressive medical and surgical therapy may significantly reduce morbidity and mortality. This case demonstrates that a minor tooth infection can cause a polymicrobial neck infection, resulting in NF and requiring extensive debridement and antibiotic treatment.

REFERENCES