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Odontogenic Necrotizing Fasciitis in the Neck and Thoracic Region: A Case Report

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Abstract: Mediastinitis and necrotizing fasciitis are the most threatening complications of odontogenic infection that are not appropriately treated. We reported a 32-year-old woman with odontogenic necrotizing fasciitis in the neck and thoracic region due to second and third lower molar infection that started and progressed in ten weeks. This disease course was initiated by a small abscess in the submandibular region that spread to the neck and right chest. This condition did not progress into mediastinitis which had a poorer prognosis. Early rupture of the abscess may prevent the extent of the infection into the mediastinum. The patient's condition improved after consuming antibiotic, analgesic, and debridement performed on her. The case management was consistent with the literature. The patient only came for first follow-up and then loss-to-follow-up. Therefore, skin flap surgery cannot be conducted.
Keywords: necrotizing fasciitis; odontogenic source; neck; thoracic region

INTRODUCTION

Necrotizing fasciitis is a soft tissue infection due to bacterial infection spreading and is characterized by extensive tissue necrosis and gas formation in the subcutaneous tissue, fascia, and deep tissue.[1,2] This condition is associated with systemic toxicity and a high mortality rate. Its prognosis depends on early diagnosis and prompt treatment.[2] Necrotizing fasciitis is well-recognized in any body region and is most commonly found in the extremities, trunk, abdominal wall, and perineum. Head and neck region is relatively uncommon, and most of these cases are caused by odontogenic infection.[2,3] If necrotizing fasciitis worsen, the management will be challenging with higher morbidity and mortality risks.[4] Therefore, we report a case of odontogenic necrotizing fasciitis in the neck and thoracic region.

CASE REPORT

A 32-year-old woman was admitted to the surgery department with a painful wound in the neck and left chest for approximately ten weeks. The patient stated that there was a small-sized abscess under the right jaw, which then enlarged and extended to the neck and chest. After two weeks, the abscess burst spontaneously, and the wound was not treated properly. On the physical examination, there was pus discharge and necrotic tissue above the wide ulcer without a distinct border from the neck to the right chest (Figure 1). Intraoral examination revealed dental caries on the second and third molars at the lower right region. The patient had good physical condition and consciousness. No sepsis sign was noted. Blood tests showed a leukocytosis. CT scan showed a lesion with fluid density and wide soft-tissue emphysema in the right supraclavicular region and anterior thorax extending to the right breast (Figure 2). *Klebsiella pneumoniae* sp infection was found from the culture examination after debridement. Based on the clinical findings and examinations, the patient was diagnosed with necrotizing fasciitis. Luckily, the patient did not have a severe infection such as mediastinitis, which can be seen from its radiographic findings showing no other soft tissue abnormalities in the mediastinum.

The patient was immediately treated with a broad-spectrum antibiotic and analgetic. The patient was planned for debridement but refused on her first day of hospitalization. After being re-educated, she finally agreed, and the surgery was performed to remove all necrotic tissues in the neck and thorax. The second and third lower molars were also extracted to prevent the recurrence.

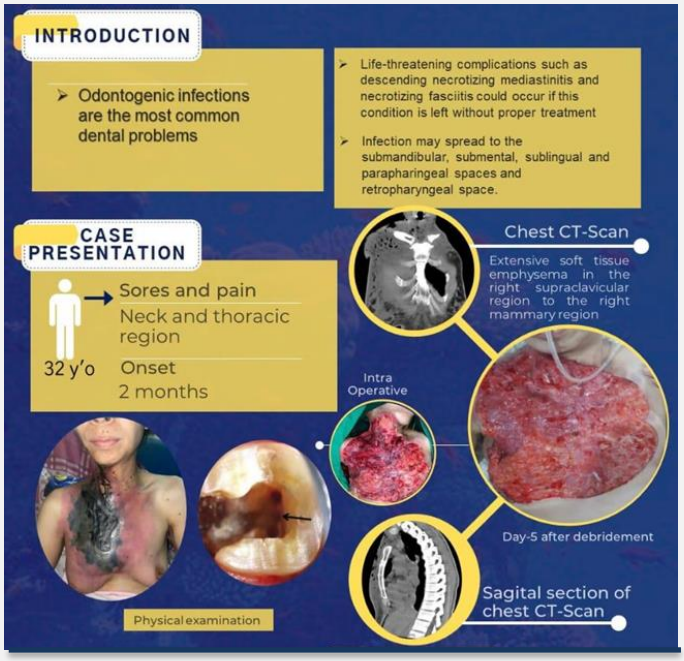

Figure 1. The whole picture of this patient

Figure 1. Chest CT-scan (Left: Coronal; Right: Sagittal). Extensive soft tissue emphysema was revealed from the right supraclavicular region to the right mammary region

After five days of admission, the patient was discharged with open wound care. She came to the outpatient surgery department with a better general condition and appropriate wound care without any signs of reinfection. The further management plan was skin flap surgery by Plastic Surgery Department but the patient did not come for the second follow-up.

DISCUSSION

Necrotizing fasciitis is an acutely progressive fascia and subcutaneous tissue infection which can occur in various parts of the body.[5] Necrotizing fasciitis can be found in patients of all ages without gender and race predilection.[3] Previous study has reported the incidence of necrotizing fasciitis of 2,6% among hospitalized infections.[5] The most common cause of necrotizing fasciitis is odontogenic infection and is more common in patients with immunosuppression, diabetes mellitus, chronic kidney disease, history of trauma, surgery, or radiotherapy. Other causes include oropharyngeal infections such as tonsillitis or peritonsillar abscess, insect bites, and postoperative infection.[3,5] This condition is commonly found in the extremities, abdominal wall, and perineum. The head and neck region is relatively uncommon because it has more blood supply compared to other regions.[5,6] Head and neck region only accounts for 1–10% of necrotizing fasciitis cases.[6]

Necrotizing fasciitis is a polymicrobial or combination of aerobic-anaerobic infection.[3,7,8] *Klebsiella pneumoniae* is the most commonly identified and aggressive pathogen associated with a higher mortality rate of up to 60%. These bacteria are found in a nosocomial form related to multidrug resistance.[9] Other common organisms are *S. aureus;* group A beta hemolytic *streptococcus*; group G, and *H Streptococci, Staphylococci; Haemophilus influenzae type B, Bacteroides species, and Clostridia species*.[10] In this patient, the cause of necrotizing fasciitis odontogenic infection is in line with the literature that stated odontogenic infection was the most common cause of necrotizing fasciitis.

Odontogenic infection on the second and third lower molars is the primary source of infection in necrotizing fasciitis.[2] The initial symptoms are usually benign and associated with dental infections and pharyngitis. The clinical course of necrotizing fasciitis usually begins 2-4 days after the initial insult, and bacterial enzymes are the main cause of the liquefaction of subcutaneous fat and connective tissue.[11] Moreover, fever may be noted. Necrosis is caused by lymphocyte infiltration, vascular thrombosis, and extension into the muscle layer. Dental infection may reach the mylohyoid muscle that sticks to the mandible and extends to the upper region (skull base) and the lower region (thorax and mediastinum). In this patient, necrosis was found in the submandibular region after the second and third lower molar infections, which extended to the neck and thorax.[8]

The initial symptoms of necrotizing fasciitis often mimic cellulitis or erysipelas. The typical symptoms are systemic toxicity, rapidly progressive pain, and the presence of gas.[2] In this patient, necrotizing fasciitis occurred in ten weeks. A small abscess initially notes the clinical course in the submandibular region extending to the neck and right chest. Another study identified the processes of necrotizing fasciitis with induration, erythema, pain, and crackles in 3-4 days.[9] The presence of pus and necrotic tissues on the wound is the basis for confirmatory imaging

examination. The presence of air bubbles may be found in the standard radiological examination. Meanwhile, a CT-scan may show specific signs of parietal collections, edema in the subcutaneous and fatty tissue, local gas collection, and locoregional extension. CT-scan has become the routine imaging examination for diagnosing, evaluating the extension of the disease, and finding complications such as mediastinitis and vascular involvement.[2,9]

In this case, there was no progression to mediastinitis. This complication results from the anatomy of the cervical fascia and its connection to the mediastinal fascia and gravitational expansion.[9] Early rupture of the submandibular abscess may help to prevent further extension of the infection into the mediastinum, which can be seen in this patient. Although the clinical course tended to be longer than usual but did not lead to more severe complications such as mediastinitis. It could be due to early rupture of the submandibular abscess, which helped to prevent the extension into the pretracheal, lateropharyngeal, retropharyngeal spaces, and mediastinum. Surgical treatment is based on debridement through wide drainage incisions on the abscess and daily dressing changes. Prompt drainage incisions are very important for surgeons to prevent severe complications.[9]

CONCLUSION

We report a case of odontogenic necrotizing fasciitis in the neck and thoracic region. Early diagnosis and treatment with drainage incisions and debridement as early as possible are essential in preventing complications. In this case, patient had necrotizing fasciitis due to the second and third lower molar infection. The patients underwent prompt debridement consistent with the literature but skin flap surgery was not conducted because the patients was loss-to-follow-up.

Conflict of Interest

There is no conflict of interest in this study.

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