

Extensive Necrotizing Fasciitis of the Neck: A Rare Case Report

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ABSTRACT

Necrotizing fasciitis of the neck and chest wall is a very rare, aggressive infection with high morbidity and mortality. It caused a severe soft tissue infection involving subcutaneous tissue and fascial planes. This infection is more prone in patients with impaired immune systems. Its aggressiveness can also be rapidly fatal, thus requiring aggressive medical and surgical therapy to improve the prognosis. We present a case of a young man with no comorbidities who had an extensive submandibular abscess with necrotizing fasciitis of the neck, anterior chest wall, and descending mediastinitis. Computed tomography of the neck and thorax showed evidence of the initial diagnosis. He was treated with broad-spectrum intravenous antibiotics and surgical debridement of the neck and anterior chest wound. After the surgery, his condition rapidly improved, and he was discharged after a week. The wound was healed after a month of daily dressing.

INTRODUCTION

Necrotizing fasciitis (NF) of the chest wall is a very rare and aggressive pathology, with significant mortality that spreads along the subcutaneous tissue and fascial plane. Its aggressive behaviour causes widespread necrosis of the subcutaneous fat, skin, and muscle. It can occur after inappropriate treatment of abscesses, especially in patients with diabetes, obesity, steroid treatment, chronic renal failure, old age, poor nutritional status, peripheral vascular disease, or smoking [1]. NF is less common in the head, neck, or chest area, than in limbs. It is usually secondary to the dental or peritonsillar area infection, which progresses to para or retropharyngeal and mediastinum abscesses [2]. Early diagnosis and a combination of medical and surgical treatment are essential to prevent mortality [3]. We present a case of a young healthy man with NF of the neck, anterior chest wall, and descending mediastinitis caused by a submandibular abscess, successfully treated with broad-spectrum intravenous antibiotics and surgical debridement.

CASE PRESENTATION

A healthy 24-year-old man was referred to an emergency Otorhinolaryngology service for a painful swelling on the right side of his neck and a foul-smelly right anterior chest wound. The pain and swelling started three days before the visit. He denied toothache, gum swelling, or sore throat. Physical examination revealed a swollen and warm right submandibular area, extending to the right side of the chest, with evidence of necrotic soft tissue areas and pus at the chest wound (Figure 1). The patient reported tolerable pain over the neck and anterior chest, but no shortness of breath, central chest pain, or fever. A dental assessment showed the swelling has no connection to the dental area.



Figure 1 Right neck and anterior chest wall necrotic tissue and pus discharge

Blood investigation showed a raised of total white cells, with normal random and fasting glucose, and negative for viral screening. There was no documented high temperature at the emergency room. Computed tomography (CT) of the neck and thorax revealed extensive collection involving the right submandibular space, descending to the anterior chest wall, and retrosternal region. There is also air within the collection that represents a necrotizing infection or gas-producing organisms (Figure 2).

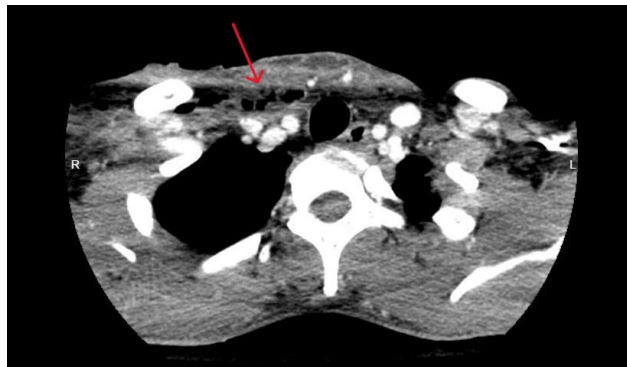


Figure 2 CT image in the axial view showed hypodensity of the anterior chest with air within the collection (red arrow), and extending to the anterior chest

The patient was started with intravenous ampicillin-sulbactam antibiotics and taken into the operation theatre together with the surgical team. The procedure included drainage and extensive debridement of the neck and anterior chest necrotic tissue (Figure 3). The retrosternal collection was managed conservatively. The pus was sent for culture and sensitivity pre- and post-operatively but revealed no significant growth of organisms. The diagnosis of necrotizing fasciitis was based on clinical and intraoperative findings. After a week of daily diluted povidone dressing, his condition and the wound dramatically improved. Inflammatory markers returned to normal, and he was discharged home with another course of oral antibiotics. He was reviewed again in the outpatient clinic and the wound completely healed after a month.



Figure 3 Post-surgical debridement of right neck and anterior chest wall

DISCUSSION

NF is less common in the head and neck region, however more common as a descending odontogenic infection that spreads along the fascial and subcutaneous tissue to the neck and chest, causing mediastinitis [2]. It is commoner in the abdomen, extremities, and perineum. In this index case, the main collection is at the submandibular region, which does not communicate with the teeth, and extends inferiorly to the anterior chest.

The bacteria involved in the development of NF include *Clostridium perfringens*, *Streptococcus* species, and *Staphylococcal* species. They usually affect the elderly and immunocompromised groups. A massive and widespread infection could be associated with systemic illness and immunocompromised states such as vascular disease, diabetes, obesity, bad nutrition, and human immunovirus [1]. In contrast to our reported case, the patient developed an extensive NF without any associated illness and was not immunocompromised. More interestingly, the pus culture was sent twice and showed no significant bacterial growth.

As NF is an aggressive form of infection, early diagnosis, and aggressive medical and surgical intervention are necessary for a better prognosis. In a suspicious case, CT imaging of the neck and thorax is essential to help establish the diagnosis and to help detect the complications. The common CT findings are thickening of subcutaneous tissues, cervical fascia, platysma, and muscles, as well as collection within multiple neck compartments. Other than that, gas collection in the soft tissue is also suggestive of NF.

Surgical intervention namely debridement of NF, should be arranged as early as possible and sometimes require multiple debridement. Daily changes of the dressing should be done after the debridement. Negative pressure wound therapy is also a good option for healing as a primary intention. It is a technique that uses a controlled sub-atmospheric pressure. In our index case, the patient's wound is well healed after a month of daily diluted povidone dressing initially which subsequently changed to saline dressing.

In an extensive NF, the mortality rate ranges from 20-80% and has been linked with factors such as advanced age, uncontrolled diabetes, states of immunosuppression, streptococcal strains, and delayed surgery [4]. Thus, early recognition of NF and prompt medical and aggressive surgical debridement were essential to reduce sepsis and mortality rates.

CONCLUSION

NF is an aggressive and potentially life-threatening disease. A suspicion of NF should always be taken when there is necrotic skin or soft tissue with interruption of the skin continuity. Early diagnosis and aggressive medical and surgical treatment ensure good results. Debridement is always a need to control the disease and stop the destructive event.

CONFLICT OF INTEREST

The authors agree that this research was conducted in the absence of any self-benefits, commercial or financial conflicts and declare the absence of conflicting interests.

Informed Consent

The patient's informed consent was obtained.

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AUTHORS' CONTRIBUTIONS

WNAS, SAAK, and JCSL drafted the manuscript. MHMR conceived of the study and provided the required information. AA critically revised the manuscript. All authors read and approved the final manuscript.

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