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An Infection Potential for Severe Complications: Deep Neck Infection

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Abstract

Background: Deep neck infections and cervical necrotizing fasciitis are infections with high complication rates and can cause significant morbidity and mortality. Mediastinitis, which can develop as a complication of these infections, can be fatal as it affects many vital organs in the mediastinum.

Case Report: In this report, we present a 67-year-old male patient who was admitted to the emergency department with complaints of sensation of sticking in the throat, dysphagia and shortness of breath. The patient was tachypneic and tachycardic with CRP value in laboratory findings and tomography results compatible with deep neck infection and mediastinitis. Airway safety was ensured and antibiotic treatment was started and the patient was hospitalized in the intensive care unit for surgical debridement.

Conclusion: In patients presenting with suspected head and neck infection, physical examination should be performed carefully and a history of immunosuppressive disease should be thoroughly investigated. It is important that the airway of these patients is protected and their treatment is provided

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rapidly. Due to the complexity of the anatomy of the head and neck, high suspicion by the examining physician may prevent delay in the treatment of these patients. Multidisciplinary work in terms of airway protection, antibiotic therapy and surgical debridement may be life-saving.

Keywords: Cervical necrotizing fasciitis, deep neck infection, mediastinitis

INTRODUCTION

Deep neck infections and cervical necrotizing fasciitis are infections with high complication rates and can result in significant morbidity and mortality. Mediastinitis, which can develop as a complication of these infections, can be fatal as it affects many vital organs in the mediastinum. In patients presenting with suspected head and neck infection, physical examination should be performed carefully, and a history of immunosuppressive disease should be thoroughly investigated.

CASE REPORT

A 67-year-old man was admitted to the emergency department with complaints of a sensation of sticking in the throat, dysphagia and shortness of breath. Vital signs showed a heart rate of 122 and respiratory rate of 24, which were otherwise within normal limits. The patient had a known history of laryngeal cancer and received radiotherapy. Physical examination revealed bilateral swelling and increased redness in the neck region. Oropharyngeal examination was normal. The patient was admitted to the emergency department with the suspicion of foreign body in the throat in the last week. In this application, Ear-Nose-Throat-Throat (ENT) was consulted and no foreign body was found in the examination performed up to the hypopharynx.

At the last admission, complete blood count and blood gas parameters were normal and only elevated CRP was found in biochemistry parameters (CRP: 356 mg/L, normal value <5 mg/L). Contrast-enhanced CT scan of the neck performed with a prediagnosis of 'deep neck infection' revealed 'diffuse air densities in all neck compartments (Figure 1), axilla (Figure 2) and

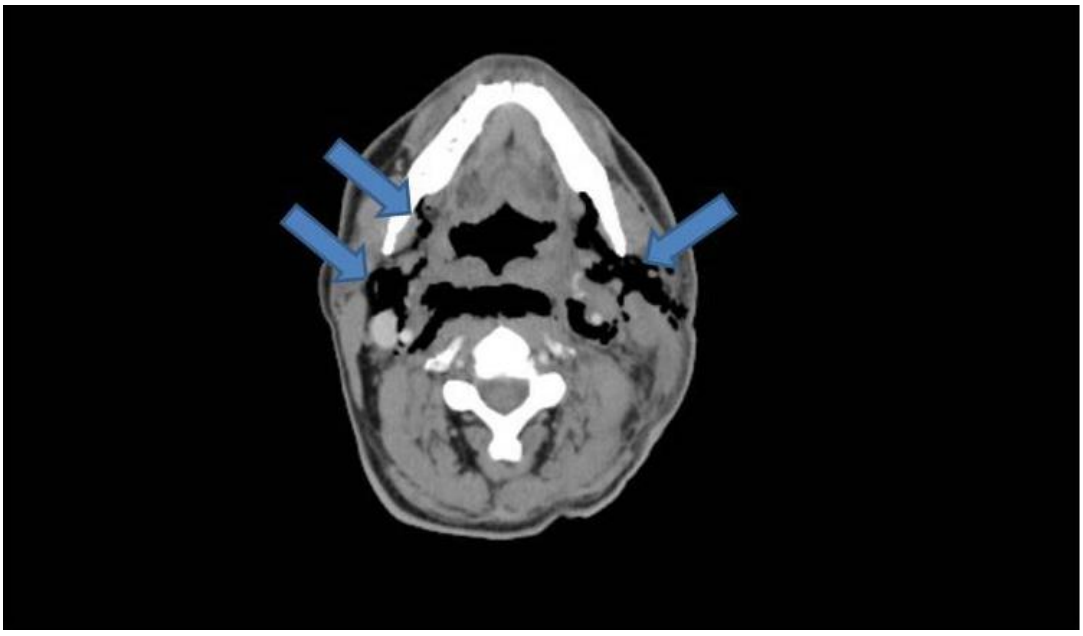

Figure 1. The arrows show diffuse air densities in neck compartments

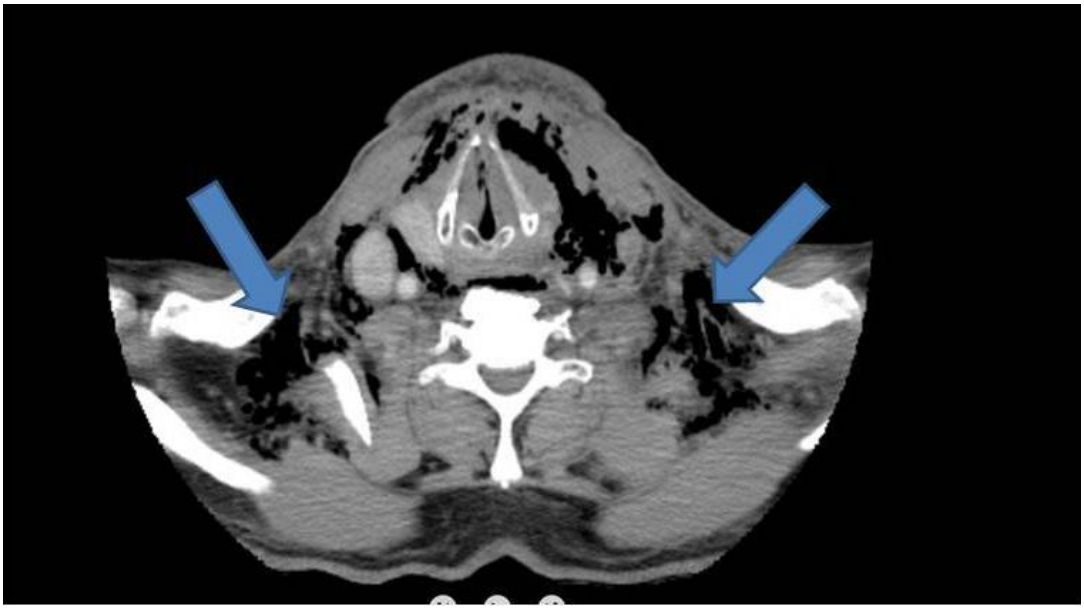

Figure 2. The arrows show diffuse air densities in bilateral axilla

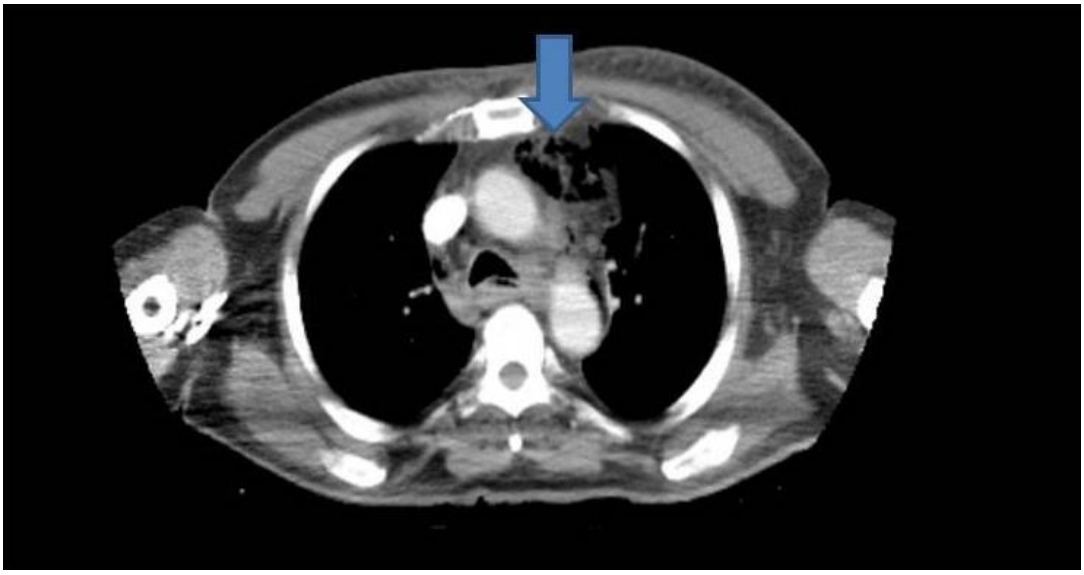

Figure 3. The arrows show pneumomediastinum and significant hyperdensity in soft tissue (mediastinitis)

mediastinum, as well as marked hyperdensity of soft tissue in defined locations (Figure 3)'. With the clinical features and CT findings, necrotizing fasciitis and associated mediastinitis were considered. The patient was started on broad-spectrum antibiotics and consulted with an ENT doctor and hospitalized in the intensive care unit. Surgery was planned in the follow-up, but the patient's general condition deteriorated; he was intubated the same day due to septic shock. After cardiopulmonary arrest developed, the patient was pronounced dead with no CPR response.

DISCUSSION

Deep neck infections (DNI) are infections with a high complication rate that can lead to significant morbidity and mortality. They are particularly associated with predisposing factors leading to immunosuppression. The complexity of the head and neck anatomy can make diagnosis difficult. High suspicion in the patient prevents delay in treatment. Life-threatening complications include airway obstruction, jugular vein thrombosis, descending mediastinitis, sepsis, acute respiratory distress syndrome (ARDS) and disseminated intravascular coagulation (DIC). The most common sources of DNI are odontogenic, tonsillar, salivary gland, foreign body and malignancy. The underlying microbiologic causes are mostly multibacterial, including anaerobic species, and may rapidly transform into necrotizing fasciitis (1,2). CT is an excellent method to assess the depth and extent of infection. On CT, thickening and fatty stratification of the skin and subcutaneous tissues immediately beneath it are suggestive of cellulitis. Irregular areas of enrichment and fluid collections may also be seen. NF of deeper tissues is seen as thickening and enhancement of the deep cervical fascia. Muscular involvement may be seen on CT with enlargement and hyperenhancement of muscles. Myonecrosis is seen as a low attenuated, non-enhancing area (3). Cervical necrotizing fasciitis (NF) is an acute, rapidly progressive, difficult-to-diagnose infection that causes necrosis of superficial fascial and subcutaneous tissue, leading to extensive gangrene and deep neck cavity abscess. NF usually affects the abdomen, groin, perineum and extremities. Head and neck involvement is seen in 1% to 10% of cases (4). Rapidly spreading necrosis leads to early systemic toxicity and may result in fatal complications including multiple organ failure, sepsis and descending mediastinitis. The mortality rate in cervical NF may vary between 4% and 50% depending on the causative organisms (5,6). Necrotizing fasciitis begins with local pain, swelling and erythema, followed by the formation of bullae and crepitation and finally manifested by skin anesthesia and necrosis. Contrast-enhanced tomography is recommended to assess the depth and extent of infection. Treatment of deep neck infection and necrotizing fasciitis includes securing the airway, antibiotic therapy and aggressive surgical debridement (7).

The mediastinum contains many vital organs and mediastinitis is an inflammation or infection of the mediastinum. Mediastinitis has many etiologies. Currently, the most common is postoperative mediastinitis, followed by descending necrotizing mediastinitis (DNM) and fibrosing mediastinitis. DNM is an acute process caused by the spread of a pharyngeal, odontogenic or cervical infection that progresses into the mediastinum. While this type of mediastinitis was previously responsible for 70% of cases, there has been a significant decrease in incidence due to advances in imaging and antibiotic therapy (8). Polymicrobial infection accounts for about 58% of cases, while the rest

are exclusively gram-positive organisms, including streptococci or anaerobes. Klebsiella and other gram-negative enterobacteria may be causative in patients with diabetes (9). Despite available therapies, the mortality rate after surgery and in DNM can reach 20% to 40% (10).

CONCLUSION

Deep neck infections and cervical necrotizing fasciitis are infections with high complication rates and can cause significant morbidity and mortality. Due to the complexity of the head and neck anatomy, high suspicion by the examining physician may prevent delay in treatment. Multidisciplinary work in terms of ensuring airway safety, antibiotic therapy and surgical debridement may be life-saving.

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Conflict of Interest Statement: The author declares that have no conflict of interest.

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