

Acute Mediastinitis Caused by Parapharyngeal Abscess and Carotid Sheath Infection: Case Report

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ABSTRACT

Deep neck infections are less common today than in the past. Still, odontogenic infections due to tooth decay and periodontal disease are common in the community. Although odontogenic infections in general are locally limited, they can progress to deep neck infections and lead to life-threatening complications in exceptional cases. Mediastinal extensions of deep neck infections are a condition that requires rapid diagnosis and should be considered first in patients who have a worsening general condition and swelling in the face - neck extending to the bottom of the clavicle and who have a toxic appearance. These infections need immediate treatment. A rapid and accurate clinical, radiological and multidisciplinary approach toward our case was demonstrated to be lifesaving.

Keywords: Abscess, deep neck infection, mediastinitis, odontogenic

INTRODUCTION

Deep neck infection (DNI) is one of the most important emergencies in otolaryngology practice. DNI, which may cause life-threatening complications such as mediastinitis, Lemierre syndrome, necrotizing cervical fasciitis, carotid artery aneurysm, and sepsis, is a clinical picture that requires prompt diagnosis and treatment (1,2).

In this case report, we present a parapharyngeal abscess case caused by an odontogenic infection complicated by acute descending necrotizing mediastinitis.

CASE REPORT

A fifty-three-year-old female patient was admitted to our clinic with complaints of toothache, sore throat, inability to eat, and swelling in the right cheek that started a few days before. She had diabetes mellitus in her background.

The physical examination of the patient revealed tooth decay in the right third molar. There was swelling on the right parotid

and submandibular gland, which was palpable with pain but did not fluctuate (Figure 1a). The laboratory values of the patient were as follows: leukocytes 16160/ml, neutrophils 13950/ml, and C-reactive protein 329.4 mg/l. With the preliminary diagnosis of deep neck infection, ceftriaxone 2x1 g i.v. infusion and metronidazole 2x500 mg i.v. infusion treatment were started empirically with intravenous hydration and analgesia.

Upon the extension of swelling on the right side of the patient's neck below the clavicle and the worsening of her general condition, emergency contrast-enhanced neck and thorax tomography were performed. In these radiological examinations, the right parapharyngeal abscess and subsequent acute descending necrotizing mediastinitis were observed, the thoracic surgery unit was informed, and the patient was taken to emergency surgery (Figure 2a). Following the right-sided Schobinger incision, the submandibular gland was turned over the anterior and the intense abscess was drained from the parotid deep lobe region and posterior of the submandibular gland extending to the parapharyngeal area. Upon the appearance of intense purulent secretion in

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Figure 1: a) Swelling due to deep neck infection from the right side of the patient's face and neck to the bottom of the clavicle and b) Image of the healed patient.

the localization of the carotid sheath, the sheath was opened from the skull base to the level of the clavicle. The inside of the sheath was also found to be filled with intense purulent secretion (Figure 3a). Following this, the clavicular region was explored and the necrotic tissues were cleaned. The layers were closed appropriately and the patient was transferred to thoracic surgery in the same session. After double lumen intubation, the thoracoscopic entrance was performed through video-assisted thoracic surgery (VATS). The exploration showed infiltration of abscess content from the mediastinum into the thorax. About 600 cc of empyema content was aspirated. It was revealed that the mediastinal surface was necrotized starting from the level of the azygos to the level of the apex. Upon opening the mediastinum with the help of a harmonic scalpel, it was observed that the inflammation came from the edges of the esophagus, trachea, and vena cava superior (VCS). The inflammatory content was aspirated and necrotic tissues were also debrided (Figure 3b). After intrapleural lavage, a thoracic tube was inserted, the expansion of the lung was observed, and the layers were duly closed.

The patient was followed in the intensive care unit (ICU) for approximately 15 days, one week of which was with intubation, and in the otolaryngology clinic for about three weeks. Upon

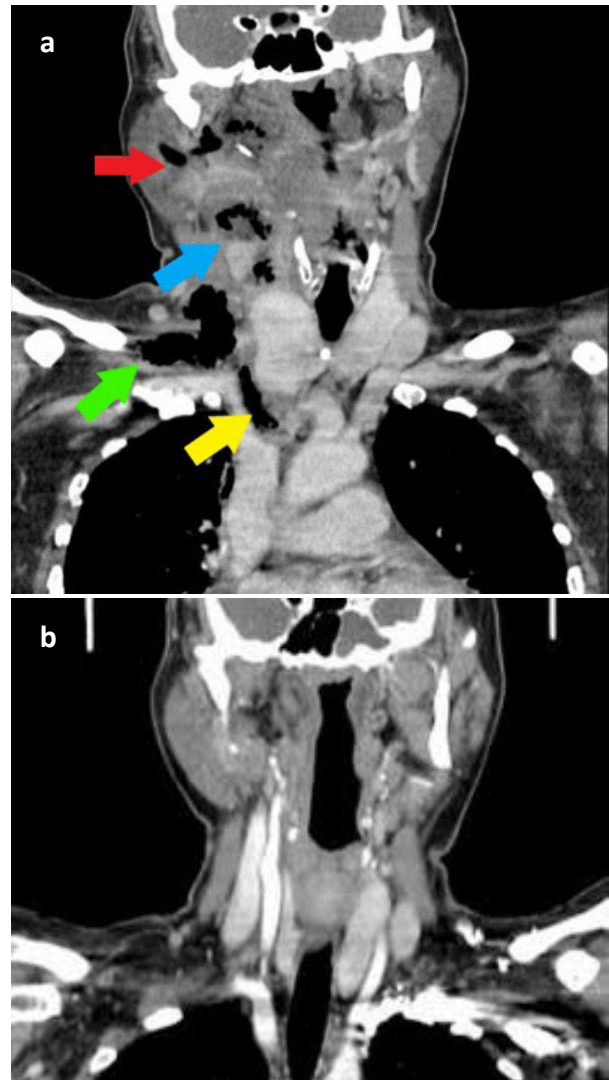


Figure 2: Contrast-enhanced coronal neck CT imaging shows a) a deep neck abscess with air bubbles, starting from the parotid cavity (red arrow), extending to the parapharyngeal and visceral space inferiorly (blue arrow), which opened to the danger space and spread to the mediastinum (yellow arrow); the swelling starting under the clavicle in the physical examination (green arrow). b) In the coronal plane tomography image of the patient three months later, the abscess areas in the neck and mediastinum were completely healed and had a natural appearance.

restoring the oral intake and turning radiological images and laboratory parameters to normal, the patient was discharged with recommendations (Figure 2b). No pathology was detected in the follow-up examinations of the patient for six months (Figure 1b).

DISCUSSION

Deep neck infections most often originate from the septic foci of the mandibular teeth, tonsils, parotid gland, deep cervical lymph nodes, middle ear, or sinuses (3). Although a rare complication, the mediastinal spread of deep neck infections

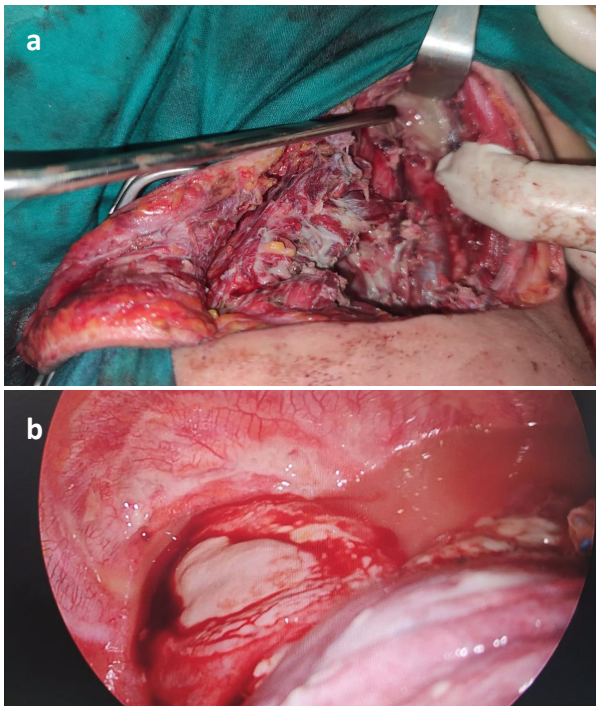


Figure 3: a) Dense purulent secretion in the right carotid sheath and b) rapidly developing pleural empyema and the appearance which is consistent with acute inflammation and mediastinitis in the right upper mediastinal pleura.

is an important complication to consider in a toxic-looking patient. Early diagnosis of mediastinitis is difficult due to the uncertainty of its symptoms. The initial findings are mostly retrosternal pain due to cervical infection, swelling in the cheek-neck, stiffness, crepitation, and trismus, and they may progress to sepsis in a short time following the detection of infection.

The main steps of treatment are the selection of antibiotics appropriate to the etiological agent and surgical drainage (4). The mortality rate is high in cases that cannot be diagnosed early or treated correctly/adequately. The surgical intervention type is determined by the extent of infection in the mediastinum. For drainage of the visceral compartments in the mediastinum, video-assisted thoracic surgery (VATS) or thoracotomy may be needed. When deciding on drainage in cases with infection foci such as parapharyngeal and retropharyngeal ones, it is crucial to detect whether local suppuration has occurred, or whether the infection is in the cellulite stage. Imaging methods can be used because it is sometimes difficult to decide on abscess formation by clinical examination. Surgical drainage of the neck and mediastinum is necessary for deep neck infections complicated by acute necrotizing mediastinitis. The mediastinal approach is performed by the cervicomediastinal or transthoracic method. Although the cervical approach can be effective in early mediastinitis, thoracotomy is usually indicated when the necrotizing process enters the “danger space” (5, 6). In our case, since an abscess involving all the parapharyngeal region and the carotid sheath developed, we planned to clean all abscess foci by achieving full control of the surgical area in

the neck with a Schobinger incision. Following the drainage of the abscess region to the level of the clavicle, the patient was transferred to the thoracic surgery unit.

Another important issue in deep neck infections is providing airway control. Therefore, when necessary, intubation and even tracheotomy can be performed (3). In our case, insufficient oral opening due to trismus prevented endotracheal intubation. Therefore, we performed nasotracheal intubation.

In our case, the rapid extension of the swelling from the lower level of the neck to the bottom of the clavicle and the rapid deterioration of the general condition of the patient made us think that acute mediastinitis was developing, and requested emergency contrast tomography. Thus, we detected mediastinal spread with parapharyngeal and carotid sheath abscesses in the patient. Our case has demonstrated that in situations where deep neck infection progresses and becomes complicated, the rapid application of a multidisciplinary approach is lifesaving.

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