

DEEP NECK INFECTION AFTER THIRD MOLAR EXTRACTION*

Üçüncü Molar Çekiminden Sonra Oluşan Derin Boyun Enfeksiyonu

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ABSTRACT

Odontogenic and oropharyngeal infections are relatively common in the cervicofacial region. In rare cases, odontogenic or peritonsillar abscesses may spread through the deep fascial cervical spaces and cause life-threatening complications. Odontogenic infection is the most common cause of deep neck infections and it accounts for 43% of the cases. Early diagnosis, immediate antibiotic treatment, and surgical drainage are the basis of therapeutic success. Deep neck infections are potentially life threatening complications if they are not diagnosed in time and treated quickly. This case report presents clinical, radiological features and treatment of the spread of abscesses through cervical spaces of an unusual case of deep neck infection that was caused by the secondary infection of the root remnants after extraction.

Keywords: Deep neck infection; odontogenic infection; third molar extraction

ÖZ

Odontojenik ve orofaringeal enfeksiyonlar baş boyun bölgesinde oldukça yaygındır. Nadiren odontojenik ve peritonsiller abseler derin fasyal servikal boşluklar yoluyla yayılabilir ve hayatı tehdit eden komplikasyonlara sebep olabilir. Odontojenik enfeksiyonlar derin boyun enfeksiyonlarının en sık karşılaşılan nedenidir ve olguların %43'ünü oluşturmaktadır. Erken teşhis, acil antibiyotik tedavisi ve cerrahi drenaj terapötik başarının temelini oluşturmaktadır. Erken teşhis edilmediği ve hızlı bir şekilde tedavi uygulanmadığı takdirde derin boyun enfeksiyonları potansiyel olarak hayatı tehdit eder. Bu olgu bildirisinde, diş çekimi sonrasında kalan kök parçasından kaynaklanan sekonder enfeksiyonun sebep olduğu derin boyun enfeksiyonu vakasının klinik, radyolojik özellikleri ve tedavisi sunulmuştur.

Anahtar kelimeler: Derin boyun enfeksiyonu; odontojenik enfeksiyon; üçüncü molar çekimi

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Introduction

Deep neck infections (DNI) are polymicrobial bacterial infections which usually occur following preceding infections such as tonsillitis/pharyngitis, dental caries or procedures, surgery or trauma to the head and neck region, or in intravenous drug abusers (1, 2). Odontogenic infection is the most common cause of DNI that accounts for approximately 43% of the cases (3). The infection is typically spreading along the fascial planes and spaces of the head and neck regions. Although the prevalence of DNI has decreased since antimicrobial drugs became available, these infections continue to be a cause of significant morbidity and mortality (4).

Clinical symptoms of DNI depend on the spaces infected. Common manifestations are pain, fever, swelling, dysphagia, trismus, dysphonia, otalgia, and dyspnea. Although the diagnosis of DNI is based on clinical assessment, the extent of the disease process is often difficult to evaluate by clinical examination (1). Imaging techniques have great importance in the early diagnosis of these complications. Computed tomography (CT) imaging is the modality of choice in DNI (5). Dental radiographs are also useful in identifying odontogenic sources of infection (1).

This report presents a case of deep neck infection, caused by the secondary infection of a remained tooth root after mandibular third molar extraction and focuses on radiological features of abscess progression through the cervical spaces.

Case report

A 23 year-old female patient was referred to Ear Nose Throat (ENT) Department with severe dyspnea, pain, and neck swelling that originates from a dental infection. The patient was evaluated by an ENT specialist and a maxillofacial surgeon. The patient mentioned that the symptoms occurred after the removal of her mandibular right third molar tooth in a private dental clinic. She stated that the tooth extraction was troublesome and lasted approximately 2 hours. The dentist of the patient was called immediately and the history of the patient was taken in details. The dentist told that the tooth was asymptomatic and the reason of extraction was halitosis. He also mentioned that the mesial root was left in the socket. The patient was informed about the remaining root and antibiotherapy was started via oral route. The dentist decided to refer the patient to a maxillofacial surgeon after the poor healing of the extraction socket. However, the patient returned to dental clinic with severe

pain and swelling 1 week after the tooth extraction and then the dentist started antibiotherapy intravenously. At the second week of the tooth extraction, symptoms worsened day by day. Finally, the patient was referred to department of ENT due to severe dyspnea. The patient was hospitalized immediately and intravenous antibiotherapy continued to be given. Contrast-enhanced CT images showed fluid collection in the right submandibular region. Also, CT images showed fluid collection at the right parapharyngeal space extending to retropharyngeal space (Figure 1).

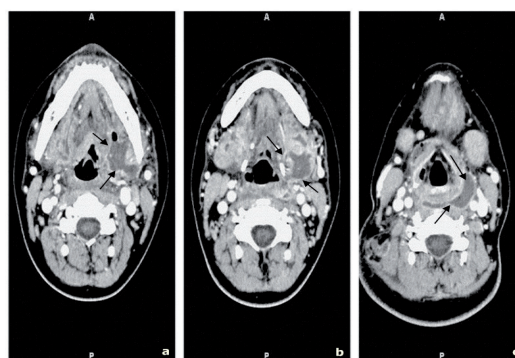


Figure 1. Axial CT sections; the arrows showing with the pathway of the extension of infection (a. submandibular space; b. parapharyngeal space; c. pretracheal space).

At the second day of hospitalization severe dyspnea continued and tracheotomy was performed. Percutaneous abscess drainage was performed under CT guidance. The drainage fluid culture was evaluated and the responsible agents were found as gram positive *Staphylococcus haemolyticus* and gram negative *Klebsiella pneumonia*, which were mainly facultatively anaerobic. These bacteria are found in the normal flora of the mouth, skin, and intestines and both are sensitive to the combination of amoxicillin and clavulanic acid. Intravenous antibiotherapy was continued with amoxicillin and clavulanic acid combination (Augmentin 1.2 IU, twice daily) for twelve days before and after surgical procedures. After the immediate management, the patient was referred to the department of Oral and Maxillofacial Surgery for further evaluation. Extraoral examination revealed a diffuse swelling at the right submandibular region and the patient's maximum mouth opening was 3 millimeters. Intraoral examination revealed a purulent discharge from the third molar region. In panoramic radiograph, a tooth root was noticed in third molar tooth's socket (Figure 2).



Figure 2. Panoramic radiograph showing the remaining tooth root.

The tooth root was removed under conscious intravenous sedation and local anesthesia at the 5th day of hospitalization when the patient's mouth opening was right for extraction. No complication was observed during the first postoperative week

and the patient was discharged from the hospital asymptotically one week after the surgery. A follow-up panoramic radiograph was taken at postoperative third month and healing was observed in the extraction site (Figure 3).

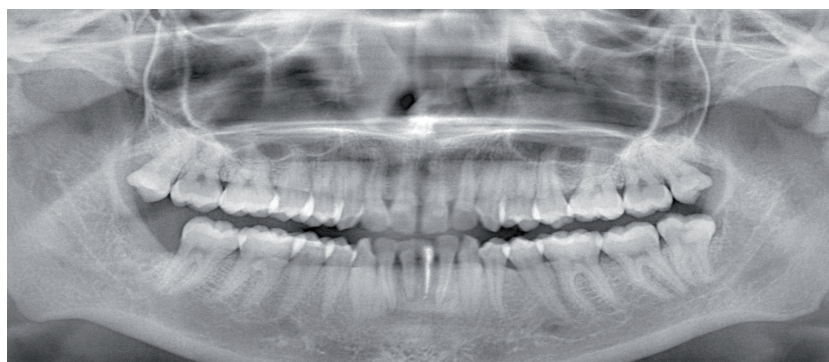


Figure 3. Panoramic radiograph showing good bone healing at postoperative 3rd month.

Discussion

Mandibular third molars are the most frequently impacted teeth. 1/3 of patients who have impacted third molars need surgical extraction (6). Third molar associated complications requiring hospitalization include deep space infections, mandibular fractures, parapharyngeal displacement of wisdom tooth or root, osteomyelitis, and transection of lingual nerve (7). Recent studies showed that dental infections are the most common source of DNI, which account for approximately 50% of cases. In the literature, most of the dental originated DNI cases were associated with pericoronitis or acute apical periodontitis of decayed teeth (8-14). In the present case, DNI occurred after extraction of an asymptomatic third molar tooth. Although the antibiotherapy was started immediately after the extraction, infection spread to the neck in

a patient with no systematic compromise. In some complicated cases, it could be difficult for dentists to extract a tooth completely and a tooth root could be left in socket. In most cases, the tooth root does not lead to an infection if the extracted tooth was not previously infected. However, it should be always kept in mind that all types of dental treatment could be a potential risk for severe, life threatening infections. Close follow up is essential especially if a tooth root is left behind. In these situations, dentists should inform the patient and refer him to a maxillofacial surgeon immediately. Early diagnosis is crucial in patients suffering from DNI. Clinical symptoms can be present in early or late stages of the disease so that radiographic examinations become more important. CT scans are the easiest and fastest method in the diagnosis of DNIs. It provides the determination of the involved spaces, the examination of the airway, and

the possible presence of air inclusion in the abscess formations (12-15). In this present case, the origin and the spread route of the infection were determined by CT scan. Panoramic and periapical radiographies were also essential for detailed examination of the dental source of infection before the operation. In DNI, the infection spreads quickly and becomes fatal if immediate treatment is not applied. The mortality rate was reported to be 20-75% (16). Aggressive airway maintenance, intravenous antibiotics and surgical drainage form the cornerstones of management (17, 18).

In our case, the patient's symptoms got worse despite antibiotherapy and at the second day of hospitalization tracheotomy was performed. The symptoms were slightly improved by time, however it did not completely heal until the extraction of the retained root. After the extraction of tooth root, the symptoms improved quickly at postoperative first week and the patient was discharged. Head and neck infections could spread in three ways: local progression through the fascial spaces, drainage to regional lymph nodes, and haematogenous way. Fascial spaces are fascia-lined areas that can be eroded or distended by purulent exudate. These areas are potential spaces that do not exist in healthy people but become filled during infections. Extension of odontogenic infections beyond the mandibular spaces is an uncommon occurrence. However, when it happens, spreading to deep cervical spaces may have serious life-threatening sequelae. These sequelae may be the result of locally induced complications, such as upper airway obstructions, or of distant problems, even mediastinitis (19-22). Lateral pharyngeal space infections could lead to several serious potential problems. When the lateral pharyngeal space is involved, it could progress rapidly. Another serious complication arises if the infection progresses from the lateral pharyngeal space to the retropharyngeal space. The retropharyngeal space lies behind the soft tissue of the posterior aspect of the pharynx (23-25). When a patient has extension of infection through the spaces, it must be evaluated with radiographs of the head and neck. To determine the location and pathway of the infection, the knowledge of the anatomy of the head and neck is very important for specialists.

The three layers of the deep cervical fascia encase the structures of the neck and form the deep neck spaces. The parotid, masticator (including the infratemporal fossa), submandibular and the prestyloid parapharyngeal space are exclusively suprahyoid in

location, and the anterior visceral space is exclusively infrahyoid in location. The prevertebral space, retropharyngeal space and poststyloid parapharyngeal space traverse the neck from the skull base down to the mediastinum. When the infection spreads to the deep neck area, especially contrast-enhanced CT would be useful to observe fascial spaces and to locate abscesses effectively in the head and neck area.

Conclusion

Deep face and neck infections are potentially life threatening complications if they are not diagnosed in time and treated immediately. Dentists should have the knowledge of borders, contents, and relations of the various anatomic deep spaces of head and neck region that are likely to be invaded by odontogenic infections. A multidisciplinary approach with the intervention of maxillofacial surgeons, ENT surgeons, and radiologists is recommended for successful treatment of this kind of life-threatening infection.

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Conflict of interest

None declared

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