Cervical necrotizing fasciitis due to periapical infection of the mandibular canine tooth

Alt çene kanin dişinin periapikal enfeksiyonuna bağlı olarak gelişen servikal nekrotizan fasiit

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SUMMARY
The infection of the cervical region is called Cervical NF (CNF) which can spread rapidly along the fascial planes to other regions of the neck. It may lead to the thrombosis, destruction of the superficial nerves and skin necrosis. Odontogenic infections of mandibular molars are the most common causes for CNF. More than half of the patients with CNF have diabetes mellitus (DM) as an underlying systemic disease. Early diagnosis based on physical examination, laboratory tests and radiographic evaluation, as well as appropriate surgical management are critical in reducing morbidity and mortality. Initial treatment of CNF should include immediate hospitalization, hemodynamic and respiratory evaluation, effective high dose broad spectrum intravenous antibiotic therapy, surgical debridement of necrotic tissue and nutritional support. The aim of this report is to present a rare case of CNF originating from an infected mandibular canine in a patient with uncontrolled DM with special emphasis to the clinical characteristics of this lethal condition.

Keywords: Necrotizing fasciitis, odontogenic infection, soft tissue infection, diabetes mellitus

ÖZET
Nekrotizan fasiit (NF) nadir olarak görülen ve derin dermis tabakası, cilt altı dokular ve fasyalı planları tutan ciddi bir enfeksiyondur. NF ağırlıklı olarak ekstremitelerde, perineal bölgede ve kannın dıvannında oluşmuş gösterir. Boyun bölgesinde görülen ve çok hızlı bir şekilde yayılan enfeksiyonu Servikal NF (SNF) adı verilir. SNF kilcal damarların trombozine, yüzeyli sinirlerin tahribatına ve cilt nekrozuna neden olur. SNF nin en sık görüle nedeni alt büyük azı dişlerinin periapikal enfeksiyonudur. SNF görülen hastaların büyük bir çoğunluğunda altta yatan sistemik hastalık diabetis mellitusdur (DM). Fizik muayene bulguları, laboratuvar testleri, radiografik değerlendirmeye dayalı erken teşhis ve uygun cerrahi müdahale morbidade ve mortalitaryi azaltmada önem taşır. SNF nin başlangıç tedavisi acil hastane yatıştır, hemodinami ve solunumun değerlendirilmesi, yüksek doz geniş spektrumu intravenous antibiotik tedavisi, nekrotik dokuların cerrahi debridmanı ve beslenme desteği içermelidir. Bu olgu raporunda; kontrolsüz DM si olan hastada alt kanin dişin periapikal enfeksiyonundan kaynaklanan SNF olguu bildirilmiş ve bu letal durumun klinik özelliklerine vurgu yapılmıştır.

Anahtar kelimeler: Nekrotizan Fasiit, odontojenik enfeksiyon, yumuşak doku enfeksiyonu, diabetes mellitus

INTRODUCTION
Necrotizing fasciitis (NF) is a rare, life-threatening soft tissue infection which affects the deep layers of dermis, superficial fascia and subcutaneous tissues. Diabetes mellitus (DM), immunodeficiency disorders, malnutrition, smoking, alcohol consumption and advanced age are predisposing factors for NF. Cervical NF (CNF), is a relatively uncommon but fatal
condition (%1 to 10% among all NF cases) which is mostly associated with DM.\textsuperscript{1,4} Causative factors of CNF include mainly infections of odontogenic origin\textsuperscript{3, 5} which is followed by those of salivary gland, ear, skin and tonsils.\textsuperscript{6} Mortality rates of CNF have been reported as 0% to 27.6%.\textsuperscript{2} As the treatment delays, CNF may spread along the fascial planes leading to mediastinitis, airway obstruction, septic shock and death.\textsuperscript{2} The aim of this report is to present a rare case of CNF originating from an infected mandibular canine in a patient who has uncontrolled DM with special emphasis to the clinical characteristics of this condition.

CASE REPORT
In December 2015, a 57-year-old male patient was referred with complaints of dysphagia, severe pain and prominent swelling in his cervical region. Ten days prior to his admission, he had felt severe pain in the right mandible and had visited a private dental clinic. There, he had been initially prescribed ampicillin-sulbactam 375 mg per oral (p.o.) twice daily for five days. Later, he had been given an unknown dose of ampicillin-sulbactam intravenous (i.v.) for five days but his overall condition had not improved. The medical history of the patient revealed uncontrolled diabetes, hypertension and ischemic heart disease. Extraoral examination revealed erythema, edema and purple-colored skin tissue in the cervical region (Figure 1).

Figure 1. Clinical view of skin necrosis and erythema in neighboring tissue in cervical region.

Intraoral examination showed only two mandibular canine teeth. A large cavity was observed in the right canine which also demonstrated Class III clinical mobility and swelling in the apical region (Figure 2).

Figure 2. Intraoral view showing the mandibular right canine tooth which is the source of infection (white arrow).

The floor of the mouth was firm, edematous and tender to palpation. A necrotic area in the mucosa of the right vallecula and pus discharge were observed. Diffuse edema spreading from the floor of the mouth to the midline of the neck region was detected. Necrosis extending from skin to the superficial fascia and infrahyoid muscles were noted in physical examination.

The patient’s body temperature was 37°\textdegree C and white blood cell count (WBC) was 27x 10^3 mm^3 while the level of C-reactive protein (CRP) and fasted blood glucose were 263 mg/L and 340 mg/dL, respectively. Blood pressure was 140/80 mm Hg. Computed tomography (CT) with i.v. contrast revealed regions of hyperdensity and the presence of gas in the submandibular, submental and prelaryngeal areas as well as necrotic tissue in the right vallecular region involving the root of right mandibular canine (Figure 3).

Figure 3. Axial computed tomography (CT) scan of the patient that shows diffuse, hyperdense fluid collection and necrotic tissue (white arrows).

Patient was immediately hospitalized and 4x2g daily i.v. ampicillin-sulbactam antibiotic treatment was started. The patient was scheduled for urgent debridement of necrotic tissues under general anesthesia. Necrotic skin of approximately 5 cmx10 cm in size was excised and the debridement of the superficial and deep cervical fascial layers were performed (Figure 4A). Clear surgical margins were reached and the area was irrigated copiously with sterile saline and povidone-iodine solution (Figure 4B). The surgical defect area was left to heal by secondary intention. Both mandibular canines were extracted during the procedure. I.v. administration of clindamycin (3x 900 mg daily) was added to the pre-existing antibiotic therapy (ampicillin-sulbactam 4x2 g daily, i.v.) postoperatively. As the emergency situation was under control, the patient...
was consulted with the Department of Endocrinology in order to effectively manage his blood glucose levels. In the early stages of CNF, it could not be distinguished from dental abscess formation. Panoramic radiographs, CT scans and/or Magnetic Resonance Imaging (MRI) should be obtained for accurate diagnosis. The findings of CT scans of the present case fulfilled the diagnostic criteria for NF. Early surgical intervention is the key to increase survival rates. McHenry\(^\text{10}\) have found a significant difference among the average time intervals from hospitalization to the surgery between non-surviving and surviving patients, which were reported as 90 and 25 hours, respectively. Accordingly, the present case was operated within the first 24 hours and routine re-examinations were performed for two weeks, twice daily.

**CONCLUSION**

CNF mostly originates from the mandibular molar teeth but canines should not be disregarded as possible sources of infection. Immediate surgical intervention is critical in reducing morbidity and mortality; therefore, time span between the diagnosis and the initiation of treatment is of utmost importance.

**REFERENCES**
