



## Case Report

# A Case of Ludwig's Angina: A Rare and Potentially Lethal Neck Infection

## *Ludwig Anjina Vakası: Nadir Görülen ve Hayati Risk Oluşturan Boyun Enfeksiyonu*

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### ABSTRACT

**Introduction:** Ludwig's Angina (LA) is a rare, life-threatening infection of the mouth and submandibular spaces, mainly caused by odontogenic infections, particularly periapical abscesses in mandibular molars. The infection spreads through the submandibular and sublingual spaces, causing severe neck swelling, trismus, and difficulty swallowing. The pathogens involved are a mix of aerobic and anaerobic bacteria, including *Streptococcus viridans* and *Staphylococcus aureus*. Treatment focuses on securing the airway, followed by antibiotics and surgical drainage, with an emphasis on early intervention.

**Case Report:** A 25-year-old woman presented to our clinic with swelling, redness, and pain in the right and anterior regions of the jaw and both sides of the neck. On examination, a painful, firm swelling with redness, especially in the right submandibular and sublingual regions, limited neck mobility and trismus were observed. The patient was initially referred to the otorhinolaryngology department following a preliminary diagnosis of Ludwig's Angina, and the patient's lower impacted wisdom teeth were extracted following drainage of neck abscess.

**Conclusion:** Ludwig's Angina is a rapidly progressing, life-threatening infection of the submandibular and sublingual regions. Early diagnosis and intervention, including securing the airway, administering broad-spectrum antibiotics, and performing surgical drainage are crucial for successful outcomes and reducing mortality.

**Keywords:** Ludwig's Angina; Odontogenic infection; Surgical drainage

### ÖZET

**Giriş:** Ludwig anjina (LA), submandibular, sublingual ve submental lojların nadir görülen, yaşamı tehdit eden bir enfeksiyonudur. Enfeksiyona esas olarak odontojenik enfeksiyonlar; özellikle mandibular molar dişlerin periapikal apseleri neden olur. İlgili lojlara yayılım nedeniyle boyunda ciddi şişlik, trismus ve yutma güçlüğü gözlenir. Patojenler *Streptococcus viridans* ve *Staphylococcus aureus* dahil olmak üzere aerobik ve anaerobik bakterilerdir. Tedavisi, erken müdahalenin önemi vurgulanarak hava yolunun güvence altına alınmasını takiben, antibiyotik profilaksisi altında cerrahi drenaj yapılmasıdır.

**Vaka Raporu:** 25 yaşında kadın hasta çenesinin sağ ve ön bölgesinde şişlik, kızarıklık ve ağrı ile kliniğimize başvurdu. Yapılan intraoral muayenede özellikle sağ submandibular ve sublingual bölgede boyunda ağrılı, kızarıklık, sert bir şişlik ile beraber boyun hareketlerinde kısıtlılık ve trismus saptandı. Hasta ilk olarak Ludwig anjina ön tanısıyla kulak burun boğaz bölümüne konsültasyon amaçlı sevk edildi ve boyun apsесinin drenajını takiben hastanın alt gömülü yirmi yaş dişleri çekildi.

**Sonuç:** Ludwig anjina hızlı ilerleyen, hayati tehlike oluşturan derin bir boyun enfeksiyonudur. Erken tanı ve hastanın zamanında hospitalize edilmesi mortaliteyi azaltmada önemli bir rol oynar.

**Anahtar Kelimeler:** Cerrahi drenaj; Ludwig anjina; Odontojenik enfeksiyon

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## INTRODUCTION

Ludwig's Angina (LA) is a rapidly progressing, life-threatening infection of the floor of the mouth and submandibular spaces, first identified by German surgeon Karl Friedrich Wilhelm von Ludwig in 1836.<sup>1</sup> Odontogenic infections cause this severe cellulitis in 70% of the cases and typically affects adults with periapical abscesses originating from mandibular molars, although other risk factors include poor dental hygiene, trauma, immunosuppression, and systemic illnesses like diabetes and HIV.<sup>2</sup>

The infection commonly spreads through submental, sublingual, and submandibular spaces, causing severe neck swelling, trismus, and difficulty in swallowing. The cause of Ludwig's Angina is a mixture of aerobic and anaerobic bacteria normally present in the oral flora. These are mainly *Streptococcus viridans*, *Staphylococcus aureus*,  $\beta$ -hemolytic *Streptococcus* species and *Staphylococcus epidermidis*.<sup>3,4</sup> Ludwig's Angina has the potential to cause airway obstruction. Treatment plan should prioritize ensuring and maintaining airway patency. Prophylactic antibiotic use and surgical drainage are the next steps in treatment.<sup>5</sup>



**Figure 1.** Facial swelling in a 25-year-old patient with Ludwig's Angina.

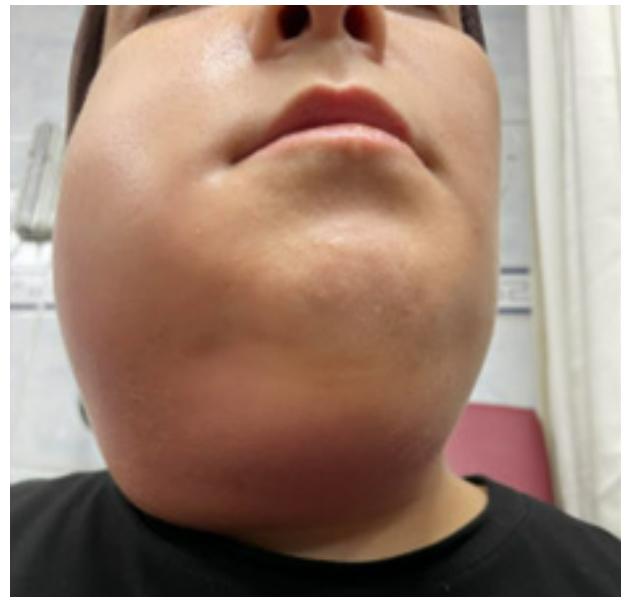
This article presents a rare case of Ludwig's Angina and the importance of immediate airway management and treatment modality based on the current literature.

## CASE REPORT

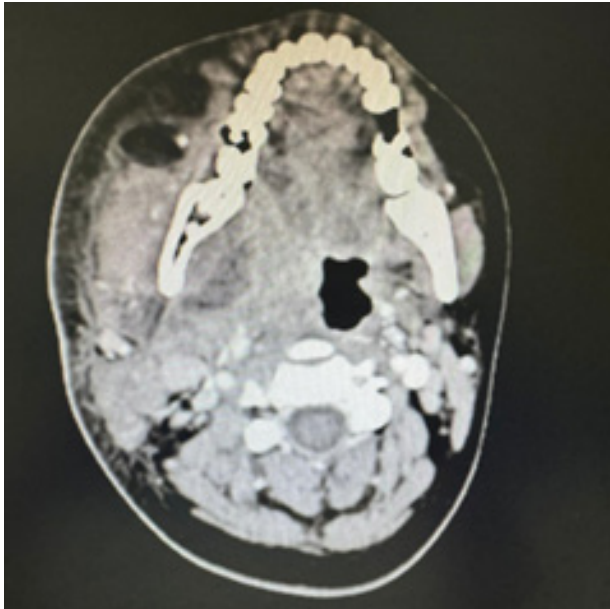
A 25-year-old female patient presented to the Department of Oral and Maxillofacial Surgery with complaints of severe submandibular pain, difficulty in breathing, and a firm swelling primarily in the right side and middle of the jaw (Figures 1-2). Her medical history included visit to the clinic with bilateral pain and swelling in the jaw and prescription of clindamycin tablets six days ago. Physical examination revealed painful, firm swelling in the right submandibular and sublingual regions, trismus, dysphagia, and mild stridor. The patient exhibited a fever of 39.5°C and lymphadenopathy. Redness and pain were observed in the mucosa surrounding the lower wisdom teeth.

The patient was first referred to the Department of Otolaryngology for consultation with a preliminary diagnosis of Ludwig's Angina based on intra-extra oral clinical examination findings.

Computed tomography revealed a periapical abscess measuring 64×80 mm, located medially adjacent to the right mandibular corpus (Figure 3). The abscess extended into the parapharyngeal space and posteriorly to the anterior aspect of the right



**Figure 2.** Swelling and redness in submandibular and submental triangles.



**Figure 3.** Extensive submandibular inflammation and edema on the right side of the neck.

parotid gland, with internal dense fluid densities. In the Department Otolaryngology, the patient was approached through a deep incision in the submandibular triangle followed by surgical drainage through the mylohyoid muscle and from the sublingual region. After the surgical drainage, the patient was administered ceftriaxone and metronidazole for seven days. Following neck drainage, the patient's infected right and left third molar teeth were extracted in two weeks later by obtaining the consent form.

## DISCUSSION

Ludwig's Angina is a rapidly progressing, potentially life-threatening cellulitis that typically begins in the submandibular space and spreads along fascial planes to the sublingual, submylohyoid, and submental regions. It is most commonly caused by untreated dental infections, particularly those associated with poor oral hygiene, such as dental caries and abscesses in the first molar. Other potential sources of infection include sialadenitis, mandibular fractures, and tongue piercings. Predisposing factors include diabetes, malnutrition, obesity, alcohol use, and immunocompromised states.<sup>6,7</sup>

The infection is polymicrobial, with oral cavity flora being the primary contributors. Viridans group Streptococci, *Staphylococcus aureus*, and *Staphylococcus epidermidis* are commonly involved.<sup>8</sup> Symptoms often include dysphagia, dysarthria, neck

pain and difficulty swallowing, and can progress to severely compromised airway.<sup>9,10</sup>

Early diagnosis is critical, as Ludwig's Angina can lead to fatal complications such as airway obstruction, sepsis, or mediastinitis. The mortality rate, once as high as 54-60%, has decreased to under 2% with early and aggressive intervention.<sup>10,11</sup> Treatment typically involves airway management, broad-spectrum antibiotics, and surgical debridement. Airway protection is crucial, and elective awake tracheostomy may be considered a safer alternative to intubation in some cases. Adequate hydration, nutrition, and upright positioning are important, particularly in patients with oropharyngeal edema.<sup>9,12</sup>

Imaging techniques such as ultrasonography, computed tomography (CT), and magnetic resonance imaging (MRI) are essential for early detection and to evaluate potential complications like abscesses or airway edema.<sup>7</sup> While intravenous antibiotics alone may be effective in some early-stage cases, surgical debridement combined with antibiotics tends to result in better outcomes, especially in preventing airway compromise.

Prompt multidisciplinary management is essential to reduce the risk of severe complications and ensure favorable outcomes.

## CONCLUSION

Ludwig's Angina is a rare but potentially lethal condition characterized by rapidly spreading cellulitis of the submandibular, sublingual, and submental spaces. Early diagnosis and prompt multidisciplinary management, including airway stabilization, aggressive antibiotic therapy, and surgical intervention when necessary, are critical to reducing morbidity and mortality. This case demonstrates that successful outcomes can be achieved with early diagnosis and treatment. Securing the airway, administering broad-spectrum antibiotics, and performing surgical drainage are essential components in managing Ludwig's Angina. As highlighted in the literature, prompt recognition and timely intervention are key to reducing the high mortality associated with this infection. An immediate hospitalization is warranted in most cases.

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