

LUDWIG'S ANGINA: A RARE BUT LIFE-THREATENING DEEP NECK SPACE INFECTION

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ABSTRACT

Ludwig's angina is a rare, life-threatening deep neck space infection involving the bilateral sub-mandibular and sublingual spaces, often caused by dental infections. This case highlights a 30-year-old male with uncontrolled type 2 diabetes and poor oral hygiene who presented with neck swelling, fever, pain, dysphagia, and respiratory distress. Physical examination revealed submandibular swelling, tenderness, and dental caries. Laboratory findings confirmed elevated ESR and Streptococcus viridans as the causative organism. Prompt treatment included airway management, broad-spectrum antibiotics (metronidazole and ampicillin), surgical drainage, and supportive care, which improved clinical outcomes. Ludwig's angina requires timely diagnosis and treatment to prevent complications like airway obstruction, sepsis, and respiratory collapse. Most cases stem from odontogenic infections, with Streptococcus and Staphylococcus species being common pathogens. Effective management includes airway stabilization, incision and drainage, and targeted antibiotics based on culture sensitivity. Clinicians must maintain a high index of suspicion for Ludwig's angina in patients with dental infections and bilateral submandibular swelling to ensure prompt and lifesaving interventions.

KEYWORDS: Ludwig's angina, airway, edema, sepsis.

INTRODUCTION

Ludwig's angina, a rare but life-threatening infection involving the floor of the mouth and deep neck spaces, primarily affects the bilateral submandibular space. It is most commonly caused by dental infections in adults and tonsillitis in children, particularly those with poor hygiene or weakened immunity.

If left untreated, it can lead to sepsis, airway obstruction, and respiratory collapse, often requiring emergency surgery. Thanks to widespread antibiotic use and improved dental care, the incidence of Ludwig's angina has significantly decreased, and its mortality rate, which once exceeded 50%, is now below 10%.

Now days it is rarely seen, the existence may not be required. It decreases the incidence attributed to the early and wide spread use of antibiotics to the treatment of the oro dental facial infections and also due to oro-dental care.

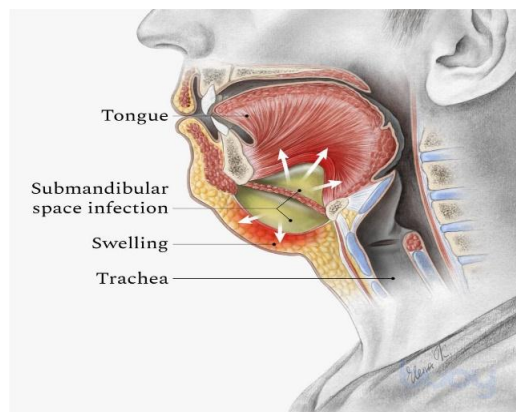


Figure 1: Surgical Drainage of Ludwig's Angina.

CASE PRESENTATION

A 30-year-old male from rural area was presented to the department of ENT, at Sri Balaji medical College Hospital, Renigunta, Tirupati on 23 January 2025. With a two-day history of severe neck pain, swelling, fever, chills and difficulty in breathing and swallowing and known case of type 2 diabetes.

PAST MEDICAL HISTORY

He is k/c/o type 2 diabetes mellitus and hypothyroidism, which could have predisposed him to the infection. He

had not sought medical attention for the dental issue, which progressively worsened, resulting in the development of Ludwig's angina.

PERSONAL HISTORY

- He is a tobacco seeker, alcoholic.
- The patient experienced malaise and fever and also noticed that he found a foul smell in mouth.

PHYSICAL EXAMINATION

Temperature: 99° F

Bp : 130/90 mm /Hg

Pulse rate: 120 beats/min

Respiratory rate: 18 Mild respiratory distress

ORAL CAVITY

- Dry mucosa, dental caries, Tissue swelling.
- Swelling of sub-mandibular area extended to thyroid cartilage.
- Tenderness of anterior and posterior lymph nodes.
- Patient can't rotate his neck pain due to swelling.

Lungs: clear and equal breath sounds.

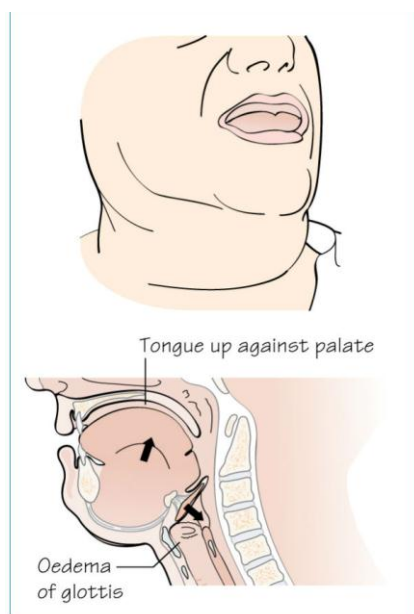


Figure 2: Ludwig's angina.

LABORATORY RESULTS AND FINDINGS

- Laboratory and imaging findings was diagnosed as deep neck infection called it as LUDWIG ANGINA.
- Based on the laboratory results patient found the ESR levels are high that is 30 mm/hr observed in blood culture.
- Infection occurred at neck space observed by neck culture due to common organism streptococcus viridans.
- Epiglottitis
- Peritonsillar abscess
- Lingual carcinoma
- Dental caries abscess

DIAGNOSIS

Patient was diagnosed with LUDWIG ANGINA

MANAGEMENT

A 1% dextrose saline solution was administered, along with 500 mg of metronidazole, 1 mg of dexamethasone, and a monitored MRRA-venous TV. A slight fluctuation was observed in the submental area. After local anesthetic injection, a wide-bore needle was used to aspirate pus for culture and sensitivity testing. Incision and drainage were performed, followed by suturing to secure a rubber drain with corrugations. A dressing that absorbed excess fluid was applied and changed regularly. The patient was admitted and positioned at a 45-degree angle for nursing care. A mask with humidified oxygen was provided to assist with breathing. The patient continued receiving a 500 mg/hour infusion of metronidazole, 500 mg/hour of ampicillin, and a dextrose saline drip. The wound drainage was extensive, and the wound was irrigated frequently with normal saline. The pus culture showed a strong bacterial growth.

COURSE AND TREATMENT

Several treatment options should be considered based on the severity of the infection. In cases where significant edema poses a risk of airway obstruction, immediate preparation for potential airway collapse is essential. Close monitoring and appropriate antimicrobial therapy are critical to preventing respiratory failure. Fiber-optic intubation via the nasal route may be necessary if the airway becomes compromised, but this should only be performed if the swelling and cellulitis worsen or if respiratory distress occurs. Broad-spectrum antibiotics, typically penicillin-based, are urgently recommended. The treatment course generally lasts for two to three weeks or until clinical improvement is observed. Additionally, further dental care may be required to address the underlying dental issues contributing to the infection.

DISCUSSION

Ludwig's angina is an infection that can quickly turn life-threatening due to the floor of the mouth and neck being involved, thereby having a potential to be a cause for respiratory distress. The anatomy of the deeper parts of the neck is quite complex in localization; otherwise management poses challenges. Mostly in such patients, usually one or more of the mandibular molars are the cause of the infection. This usually involves a significant amount of noninfected soft tissue and hence, early diagnosis becomes challenging. After the infection spreads into the deep neck spaces, it is more likely to be non-localised.

Common causes of Ludwig's angina include; Dental periapical abscesses that come from the lower molars, Trauma to the floor of the mouth and Osteomyelitis among other infections. Infected sockets after dental extraction is also one of the frequent causes. In this case, the source of infection was a periapical abscess

associated with the right second premolar, first, and second molars, which were grossly carious. Poor oral hygiene contributed to an odontogenic nature of the infection while, by virtue of his lower socioeconomic status, his poor nutritional background further added to the risk.

Other causes of Ludwig's angina include, for instance, the infected squamous cell carcinoma of the tongue but most common cause account for nearly 70%, such as dental infections. Most common pathogens involved are the Streptococcus and Staphylococcus species and Bacteroides as a causative organism is also reported in this disease. Here the predominant microorganism obtained was Staphylococcus aureus that were found to be most resistant to antibiotics like penicillin and tetracycline. Thus, erythromycin was included in antibiotic regimen because the culture and sensitivity testing indicated this to be appropriate and treatment continued for ten days.

In the classical Ludwig's angina, swollen floor of the mouth and large oedematous tongue might lead to significant airway obstruction due to tense brawny oedema in the submandibular region. In such cases, a tracheostomy may be required. In patients with impending airway obstruction, it is done ideally under local anesthesia, or in patients who require surgical drainage under general anesthesia. Fortunately, in this case, there was not real obstruction of the airway, and the nasopharyngeal airway was quite effective. Currently, prophylactic surgical decompression is not a routine; it is reserved for the ones that have fluctuation and pus.

It is very significant that clinicians know the severity of Ludwig's angina because the failure to treat on time would lead to fatal results. A history of toothache or extraction accompanied by bilateral swelling of the submandibular and sublingual region is suggestive, and such patients should be sent to management immediately.

CONCLUSION

Ludwig's angina, though extremely rare, still presents in the practice of emergencies. Important that oral physicians quickly be able to identify this disease. Main treatments include airway management, antibiotics, and surgical drainage to ensure the best outcome. Any infection of odontogenic etiology in the emergency department is considered a potential case of Ludwig's angina because this condition can be fatal if it progresses unmanaged. In more advanced cases, it is imperative to furnish protection of the airway along with surgical drainage in an attempt to avoid complications of this rare but serious condition.

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