

Management of Ludwig's angina: A case report

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World Journal of Advanced Research and Reviews, 2025, 25(01), 1352-1356

Publication history: Received on 12 November 2024; revised on 14 January 2025; accepted on 17 January 2025

Article DOI: <https://doi.org/10.30574/wjarr.2025.25.1.3912>

Abstract

Background: Ludwig's angina is a progressive cellulitis of the soft tissues of the neck and floor of the mouth that spreads quickly and frequently results in death. It is an infection which affects the sublingual, submental, and left and right submandibular spaces. Because it might obstruct airways, the condition is an emergency that needs to be treated right away

Purpose: The purpose of writing this article is to describe the treatment of Ludwig's angina.

Case: A 31-year-old male patient came with a chief complaint of swelling on the right cheek in the last 4 days.

The patient had a history of hepatitis B. Clinical examination showed facial asymmetry, deep caries of 36 and 47, root remains of 37.

Case management: Patient was treated by multiple extraction, incision and drainage of abscess, and exploration of mediastinum under general anesthesia.

Conclusion: This case report shows that prompt treatment of Ludwig's angina provides great outcome. Patients with comorbidities may require intensive care which decreasing the risk of fatality.

Keywords: Abscess; Hepatitis B; Ludwig's angina; Odontogenic infection

1. Introduction

Ludwig's angina is a progressive cellulitis of the soft tissues of the neck and floor of the mouth that spreads quickly and frequently results in death. Ludwig angina is an infection which affects the sublingual, submental, and left and right submandibular spaces [1,2].

The most prevalent cause is odontogenic. Dental abscesses and odontogenic infections, such those involving impacted second and third molars, are the usual causes of Ludwig's angina. Additional causes of infection have also been reported, including tonsillitis or pharyngeal infections, infections brought on by foreign objects, or infections that develop as a result of squamous cell carcinoma, which is seen near the base of the tongue and the floor of the mouth. Risk factors

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could include poor dental hygiene, dental caries, and systemic diseases such as acquired immunodeficiency syndrome, diabetes mellitus, systemic lupus erythematosus, malnutrition, and alcoholism [3,4].

Clinical findings are used to make the diagnosis of Ludwig's angina. A cervico-thoracic CT scan can help evaluate the extent of the oral infection, particularly in cases where an abscess has formed, while panoramic radiography can help identify the illness's origin. Ludwig's angina patients frequently experience shivers, fever, malaise, and generalised weakness. Trismus, meningismus, drooling, dysphagia, and tripod posturing are examples of more advanced symptoms that point to airway involvement. As severe obstruction worsens and there is a chance of immediate airway loss, this may happen later in the clinical course. A painful, symmetrical, tense, woody, and indurated submandibular region may be found upon examination. The floor of the mouth may be erythematous, painful, and raised, and lingual oedema may keep the mouth open. It is possible for the outer neck to appear oedematous and erythematous. There may also be cervical, sublingual, and submental lymphadenopathy [4,5].

2. Case Report

A 31-year-old male patient came with a chief complaint of swelling on the right cheek in the last 4 days. The patient had difficulty when swallowing and opening his mouth wide. Yesterday, general condition repair was carried out at the dental hospital. Today, the complaint worsened, the voice became hoarse, there was a complaint of pain in the right jaw spreading to the left jaw. The patient also complained shortness of breath and pain in the chest. He can still drink milk, juice, and eat porridge. The patient had a history of hepatitis B.

Clinical examination showed facial asymmetry, edema in the right submandibular region, submental, left submandibular extending to the 6th level of the neck and mediastinum. On intraoral examination, the maximum mouth opening was 2.8 cm, deep caries on 47, 36, and 37, edema in the sublingual region was visible, the tongue was raised. Panoramic radiograph showed deep caries of 36 and 47, root remains of 37, and inflammation in the apices of 35 and 45. The diagnosis of Ludwig's angina, right sinus parapharyngeal abscess, and mediastinitis were established.



Figure 1 Pre-operative clinical picture (a) extraoral; (b) intraoral; (c) panoramic

3. Case Management

Treatment included multiple extraction of 35, 36, 37, 46, 47, incision and drainage of abscess, and exploration of mediastinum under general anesthesia. After surgery, the patient was monitored in the ICU for four days because of his

poor condition. The airway was not secure because of an abscess in the parapharyngeal region. The risk of obstruction and ARDS increased because the infection spread to the mediastinum, resulting the patient went through a sepsis state. Mediastinal drain was inserted, then the patient was monitored in the ICU again for a few days.

The patient was moved into regular room when his condition improved. When leaving the ICU, the patient was conscious and the airway was patent. The patient could breathe without assistance. There was no pus production. On follow-up, the patient's condition was good, there were no signs of infection, no pus production in the incision wound, the post-tooth extraction wound had closed, and epithelium had formed.



Figure 2 Post-operative clinical picture on follow-up (a) extraoral; (b) intraoral (right regio); (c) intraoral (left regio)

4. Discussion

Ludwig's angina is an uncommon but potentially life-threatening. In particular, the diagnosis is based on clinical criteria. The diagnosis needs to be established quickly in order to initiate the best course of treatment and minimize complications. Oedema of the glottis, necrotising fasciitis, and descending necrotising mediastinitis—which has the highest fatality rate—are the most significant potential complications of Ludwig's angina [6].

Odontogenic infections are pathologies arising from the stomatognathic system. Depending on the cause and location, these infections can spread rapidly throughout the head and neck and cause serious and potentially fatal problems if not identified and treated promptly. Normal oral flora bacteria can become pathogenic, enter the host body and cause odontogenic infections. Caries is the entry point for the invasion of bacteria such as *S. mutans* and *Lactobacillus* spp. to the pulp. Bacteria that get to the dental pulp cause necrosis and lead to the development of abscess. Following its establishment in the periapical tissue, the infection flows through the periosteum and cortical bone, following the path of least resistance as defined by the thickness of the bone surrounding the tooth, the position of the dental apex, and muscle attachments that indicate the infection's direction and location [7,8]

The anatomical location of the tooth root and the mylohyoid muscle attachment point in the jaw are related to the location of dentoalveolar abscess. Infection spreads more easily through the lingual aspect of the molar region. The infection becomes more severe if it extends into the fascial space, which occurs outside the muscle attachment. The molar root infection enters the mylohyoid ridge and proceeds straight to the submandibular, sublingual, and submental spaces [8].

Pharyngomaxillary and retropharyngeal spaces can all be adjacently affected by the infection, causing a sudden and severe swelling of the neck that surrounds the airway. Although uncommon, the involvement of deep neck spaces has been documented. The floor of the mouth and tongue are raised and posteriorly displaced due to the infection and oedema being contained by the hyoid, mandible, and deep cervical fascia, which compromises the airway and causes oxygen deprivation. Because it might obstruct airways, the condition is an emergency that needs to be treated right away [9,10].

Systemic illnesses have been related to the Ludwig's angina, including hepatitis B. Hepatitis B is an infectious disease that can worsen the condition of the immune system, making the body susceptible to infection. Patients with a history of hepatitis B should only receive treatment for dental emergencies because they can continue to carry the virus for up to three months after symptoms go away. Proper infection control and sterilization protocols must be followed to

reduce the risk of infection [11]. In this case, the worsen condition of the patient may be caused by hepatitis B comorbidities.

The majority of patients need intensive care because there is a significant chance that their condition may worsen rapidly. People with comorbidities have a greater mortality rate because their impaired immune system [12]. In this case, the patient underwent the condition of mediastinitis and sepsis. The mortality rate of those two conditions are 37.5% and 30% respectively. The number may decreased with intensive care and high-quality care therapy. Mechanical ventilation, intubation, enteral and parenteral feeding, central venous catheterisation, vasopressor administration, blood transfusion, tracheostomy, and non-invasive ventilation were among the therapeutic procedures used in the current patients with Ludwig's angina [13].

Airway preservation and infection treatment are the fundamental principles of Ludwig's angina management. Despite inconsistent outcomes, early surgical surgery improves airway problems. Tracheal intubation may be the solution for airway control. Prior to receiving the results of the culture and antibiogram, intravenous administration of penicillin G, clindamycin, or metronidazole is recommended. Given the increasing prevalence of penicillin-resistant *Bacteroides* strains, metronidazole is recommended for the anaerobic cover [3,5,9].

5. Conclusion

This case report shows that prompt treatment of Ludwig's angina provides great outcome. Patients with comorbidities may require intensive care which decreasing the risk of fatality.

Compliance with ethical standards

Disclosure of conflict of interest

There is no conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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