

## Ludwig's Angina: The Importance of Oral Cavity Examination in Patients with a Neck Mass

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### Keywords

Ludwig angina, dental, floor of mouth, orthopantomogram

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### Abstract:

Neck mass is a common condition in primary care. The most common affected area is the cervical lymph node. The neck region is also prone infection as structurally the nodes and spaces are in close contact with the upper respiratory tract and the alimentary tract. Oral cavity is one of the most common route for harbouring infection. Poor oral hygiene and periapical dental problems are the main causes. Thus, it is important to perform a complete oral cavity examination even when trismus is present. Besides dental caries, floor of the mouth should be inspected for oedema that may impose threat to the upper airway. We report a case of Ludwig's angina originating from a periapical lesion of the lower molar stressing the importance of oral examination in patient with neck mass.

### Introduction

Ludwig's angina is defined as submandibular space cellulitis and it is characterised by a swelling at the submandibular region with concurrent elevation of the floor of the mouth and dental infection. It is a potentially fatal condition because the upper airway maybe comprised. It is more common in adults, though sporadic cases in paediatric group were reported.<sup>1</sup> Problems in the mandibular molars are identified as the most common source of infection. Clinical signs include woody-hard mass at the submandibular region. Airway observation can be treated by endotracheal intubation or surgical tracheostomy. Antibiotics improved mortality rate in patients with Ludwig Angina. Early diagnosis by the front-liners, such as the primary care doctors, is the most important step in managing Ludwig's angina.

### Case summary

WNF, a 14-year old Malay girl, presented with

a three-day history of right submandibular swelling. She sought medical attention and was prescribed oral antibiotics. The swelling did not improve after three days of oral antibiotics. She experienced disturbed sleep because of the pain which was associated with limited mouth opening; however, there was no shortness of breath or change of voice. On further questioning, she had experienced recurrent episodes of tooth ache in which she never sought any dental treatment. In this recent episode, the neck swelling was preceded by 2-week history of tooth ache.

Clinical examination revealed a teenage girl with a right submandibular swelling. It measured 10cm x 7cm and had a woody-hard consistency. It was not fluctuant. The overlying skin was inflamed and the mass involved the submental triangle which crossed the opposite side. There was no other cervical lymphadenitis palpable.

Oral cavity examination revealed trismus with

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mouth opening limited to 2 finger-breadth. Floor of the mouth was oedematous. Dental hygiene was good except there was a tooth decay on the right lower molar. Percussion revealed tenderness over the tooth.

Orthopantomogram was obtained and showed the presence of dental caries at the right lower second molar near the pulp. There was a periapical lesion at the roots of the tooth.



**Figure 1.**  
Right submandibular diffuse mass crossing the midline

The diagnosis of Ludwig's angina was clinically established. She was admitted and started on intravenous cefuroxime 750mg TDS and metronidazole 500mg TDS. Chlorhexidine mouth wash was also prescribed. She was observed for any potential upper airway obstruction. After five days, the symptoms improved. Dental extraction of the right lower second molar was done and she was discharged. She was advised to continue with oral antibiotics for one week. Two weeks later, the patient had a follow-up visit at the outpatient clinic and was well without any residual symptoms.

### Discussion

Ludwig's angina is a potentially life-threatening infection of the neck region. The inflammation



**Figure 2.**  
Examination of the oral cavity revealed trismus, raised floor of the mouth and positive tooth percussion on the right lower second molar



**Figure 3.**  
The right lower second molar (47) confirmed the dental caries and periapical lesions

occurs in the submandibular space causing oedema of the floor of the mouth. The tongue is at risk of being pushed upwards and posteriorly making the airway compromised. Mouth opening particularly the oral cavity and oropharynx, should be inspected. Floor of the mouth must always be checked for oedema which may cause a double-tongue appearance.

There is no specific guideline for the management of Ludwig's angina; the options include either conservative or surgical management.<sup>2</sup> Its management is largely dependent on clinical judgment of the patient at presentation and the clinician's experience in managing the problem. A complete oral cavity examination is warranted in order to establish the diagnosis and complications.

Dental infection is the most common source of cervical lymphadenopathy, leading to suppuration. Infection of the lower molar caries and periapical lesion can spread to

the adjacent submandibular space inducing cellulitis. History of dental ache, especially of the lower molar tooth, can be confirmed with panoramic view of the dental lesions by the orthopantomogram (OPG). In the absence of dental-related problem, clinically-suspected Ludwig's angina would justify a computed tomography because embedded foreign body in the upper neck soft tissue could mimic the condition.<sup>3</sup>

The patient must be admitted and broad spectrum antibiotics, which cover gram-positive, gram-negative, and anaerobes, should be instituted intravenously. The role of intravenous steroid is controversial as there is lack of evidence to show that it improves outcome.<sup>2</sup> In addition, the primary source of infection must be eradicated. In this case and most of other Ludwig angina cases, dental problems must be addressed through early referral to a dentist. Second and third permanent mandibular molars are usually seen in adults.<sup>1</sup> Thus, it is not uncommon to have Ludwig's angina initially seen and diagnosed by a dentist.

While dealing with the primary source of infection, the airway must be observed at all

times. Previously, tracheostomy was regarded as the treatment of choice for upper airway obstruction in Ludwig's angina. The airway should be secured by using nasal fiberoptic intubation as blind oral or nasotracheal intubation is contraindicated because of the risk of laryngospasm.<sup>4</sup> With the advent of new antibiotics, the infection can be treated effectively without the need for an artificial airway.

## Conclusion

In conclusion, Ludwig's angina should be suspected whenever a patient presents with submandibular swelling with oedema at the floor of mouth. Presence of trismus does not preclude a complete oral examination. Positive dental percussion especially at the mandibular molars, indicating the origin of the infection. At the initial stage, the oral cavity signs may not be prominent. Thus, the patient with submandibular swelling who is being treated as an outpatient must be closely monitored for signs of Ludwig's angina.

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