

## A Very Extensive Ludwig's Angina

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(Received: 14 August 2017, Accepted: 19 December 2017)

### ABSTRACT

**Ludwig's angina is a grave, fatal cellulitis usually occurs in adults. If it is diagnosed early along with immediate treatment planning can save a life. In this case, it is a widespread dental infection which extends to the neck and chest, therefore elevation of floor of mouth which causes respiratory obstruction. Airway protection techniques along with proper parenteral antibiotics and meticulous surgical drainage are the mainstay of treatment in a case of advanced staged Ludwig's angina.**

**Keywords: Ludwig's angina, odontogenic infection, surgical decompression**

### INTRODUCTION

A great German surgeon, Wilhelm Friedrich Von Ludwig in 1836 first described Ludwig's angina which is a rapidly progressing gangrenous cellulitis causing oedema of soft tissue of floor of mouth and neck.<sup>1</sup>

It presents with an acute onset and affecting submandibular, submental and sublingual spaces bilaterally which impede the airway.<sup>2</sup>

Usually, it starts with an infection from the second or third lower molar teeth spreading to the submandibular space, then to the sublingual space, first ipsilaterally, then contralateral submandibular space.<sup>3</sup> Submental space is involved via lymphatic spread. Sublingual space can also be involved first then progress to submandibular space. From sublingual space infection can spread posteriorly in a cleft between hyoglossus and genioglossus muscles causing oedema of the glottis leading to airway obstruction.<sup>2</sup>

Causes of Ludwig's angina includes odontogenic infections from second or third lower molar teeth, osteomyelitis, submandibular gland sialoadenitis, compound fracture of the jaw, penetrating infection from floor of mouth, sialolithiasis and tongue piercings.<sup>4</sup>

Predisposing factors are extraction of teeth, systemic illness (diabetes, alcoholism, AIDS, organ transplantation, trauma).<sup>5</sup> In children it can occur without any cause.

Typical clinical presentation of Ludwig's angina is swelling on the floor of mouth, dysphagia, malaise, fever, pain, and inability to swallow saliva. Stridor indicates immediate airway obstruction. Airway obstruction is due to elevation of floor of mouth, oedema of the glottis and posterior displacement of the tongue. Due to presence of swelling and oedema of glottis, it becomes difficult to anaesthetize the patient. Mortality can be prevented by immediate management of airway, removal of source of infection, surgical decompression and aggressive use of antibiotics.<sup>6</sup>

### CASE PRESENTATION

A 50-year old male patient was admitted to the hospital with the complaints of pain, difficulty in swallowing, inability to open mouth, ulceration in neck area, respiratory distress for two days following extraction of left lower second molar tooth with foul smell from wound for 8 days.

On physical examination, he was toxic and had respiratory distress. His random blood sugar was 18 mmol/L on admission.

His mouth opening was 1.5 cm interincisal distance and revealed drainage of pus at left lower second molar tooth area and gauze packing in the neck wound, swelling extended up to mid chest level (Figure 1).



**Figure 1** Ludwig's angina showing huge swelling in the neck

The patient was diagnosed with Ludwig's angina and immediate drainage of abscess was scheduled. A written consent about tracheostomy was taken. Patient's blood pressure was monitored from time to time, intravenous cannulation was done, and patient was infused with normal saline. In the operating room, 10 per cent iodine solution was used for scrubbing. Infected gauze that was in situ was removed and under local anaesthesia with 2% lignocaine with adrenaline, surgical drainage was performed. Pus was collected and sent for culture and sensitivity. Tracheostomy was avoided.



**Figure 2** Wound gaps in the neck and chest after controlling infection

The culture sensitivity report yielded growth of *Pseudomonas spp.* Colony count was profuse. Intravenous doses of meropenem, metronidazole and gentamycin were prescribed. Vigorous dressing was performed twice daily for infection control (Figure 2). Patient's blood sugar was controlled with short acting insulin according to sliding scale. Steroid injection was used eight hourly to prevent laryngeal oedema. As haemoglobin decreased to 9 g/dl, two units of whole blood were transfused and the patient was kept in a propped up position. After two weeks, vacuum compression therapy was started and when healthy granulation tissue appeared, skin grafting was planned to cover the neck wound area (Figure 3). He was cured completely with the above treatment.



**Figure 3** After skin grafting, patient was able to move his neck properly

## DISCUSSION

Ludwig's angina is an infection which rapidly extends to the upper neck causing brawny bilateral indurations.<sup>7</sup> It also presents with pain, trismus, tongue elevation, fever and dysphagia. Asphyxia is a complication of Ludwig's angina caused by oedema of soft tissue of neck. Death can occur due to acute airway obstruction during interventions. Anxiety, cyanosis and stridor are the late signs of airway obstruction which is an indication of immediate airway intervention.<sup>8</sup>

Blind nasal intubation can cause catastrophic bleeding, airway oedema, laryngospasm and aspiration. Therefore, immediate tracheostomy could be a life-saving procedure in this case.<sup>9</sup>

$\beta$ -Haemolytic Streptococcus, anaerobic organism, *peptostreptococcus*, pigmented bacteroids, *Streptococcus viridans* (40.9%), *staphylococcus aureus* (27.3%) and *staphylococcus epidermidis* (22.7%) are the causative agents. Antibiotics such as intravenous penicillin G, metronidazole and clindamycin are used prior to obtaining culture and antibiogram results.<sup>10</sup>

In this case, culture sensitivity report yielded growth of *Pseudomonas spp.* Colony count was profuse. Intravenous doses of meropenem, metronidazole and gentamycin were prescribed with good result. Steroids were also given to maintain airway.<sup>11</sup>

Some authors also recommend gentamycin.<sup>11, 12</sup> Recent case reports advocated the use of intravenous steroids which potentially avoided the need for airway management.<sup>13, 14</sup> In this case, the patient was doing well till the last follow up.

## CONCLUSION

It is important to diagnose Ludwig's angina in the early stage of the disease, when it is easy to manage. In advanced cases, however, securing the airway and meticulous surgical drainage are paramount.

## CONFLICT OF INTEREST

The authors declare that they have no competing interests in publishing this case.

## CONSENTS

Written informed consent was obtained from the patient to publish the case. A copy of written consent is available for review by the Chief Editor.

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