



## RESEARCH ARTICLE

### LUDWIG'S ANGINA - A CALL FOR URGENT AND COMPREHENSIVE INTERVENTION

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#### ABSTRACT

Ludwig's angina is a form of severe diffuse cellulitis that presents as acute onset rapidly progressive disease involving sublingual, sub mental and submandibular spaces. Ludwig's angina is observed frequently in today's practice. Our study aims to observe causative factors, clinical presentations and treatment modalities. We carried out study on 32 patients who presented to department of ENT and Head-Neck surgery, of a tertiary care hospital in Haryana from 1<sup>st</sup> January 2017 to 30<sup>th</sup> June 2017. When a case of Ludwig's angina comes to OPD, clinician should be vigilant for the presentation of Ludwig's angina because early and prompt diagnosis and proper treatment could lower down mortality and morbidity of the disease.

## INTRODUCTION

Ludwig's angina is a rapidly progressive fulminant cellulitis of submandibular, submental and sublingual spaces. It is associated with elevation and posterior displacement of tongue. It usually occurs in adults with concomitant dental infection. It was named after physician Karl Friedrich Von Ludwig who first described the condition in 1836 (Saifeldin and Evans, 2004). In case of Ludwig's angina, the term angina refers to feeling of choking due to lingual airway obstruction. It occurs more commonly in adults. Males are predominantly affected by Ludwig's angina (Nyugen *et al.*, 1992). Mortality rate associated with Ludwig's angina has fallen down to 8% from 50% in 1950 because of the use of antibiotics (Bansal *et al.*, 2003). Ludwig's angina usually originates from an odontogenic infection (Kremer and Blair, 2006). Less common causes are oral laceration, sialadenitis, infected thyroglossal duct cyst, mandibular fracture, upper respiratory tract infection, trauma to floor of mouth (Har-El *et al.*, 1994). It is also associated with diabetes mellitus, neutropenia, systemic lupus erythematosus, oral malignancy (Fischman and Graham, 1985). The prognosis of Ludwig's angina depends on rapid and prompt diagnosis, immediate protection of airway, antibiotic coverage and possible surgical management. The bacteriology of Ludwig's angina is polymicrobial.

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The organisms most commonly isolated are streptococcus viridans and staphylococcus aureus. Submandibular space is the primary site of infection (Spitalnic and Sucov, 1995). Infection can also spread to involve pharyngomaxillary and retropharyngeal space. The most dreadful complication is airway compromise (Moreland *et al.*, 1998). It is also the leading cause of death.

## MATERIALS AND METHODS

The study was conducted on 32 patients who presented with Ludwig's angina to department of ENT and Head- Neck surgery in a tertiary care hospital in Haryana, India from 1<sup>st</sup> January 2017 to 30<sup>th</sup> June 2017. 31 patients presented in OPD, 1 patient presented in emergency ENT department with old mandibular fracture and Ludwig's angina with difficulty in breathing. All patients were subjected to following assessment:

- Full ear, nose and throat examination.
- Detailed dental examination
- Culture and sensitivity of fluid if no prior antibiotic given
- CT scan in 4 cases to know extent of soft tissue swelling

## RESULTS

In this study males were predominantly affected than females. (24 males and 8 females)

**Table 1. Sex distribution of patients**

Sex	Number of patients	Percentage
Males	24	75%
Females	8	25%

Adults were predominantly affected.

**Table 2. Age distribution of patients**

Age group	Number of patients
0-10	2
10-20	3
20-30	6
30-40	11
40-50	10

Odontogenic cause (tooth extraction, dental caries) was found in 23 patients (71.85%)

**Table 3. Associated risk factors**

Risk factors	Number of patients	Percentage
Tooth extraction	10	31.25%
Dental caries/poor dental hygiene	13	40.6%
Oral laceration	3	9.37%
Sialadenitis	2	6.25%
Systemic illness	3	9.37%
Mandibular fracture	1	3.12%

24 patients responded well with conservative treatment under antibiotic coverage, in 8 patients incision and drainage was done after the swelling started to fluctuate following the antibiotic course, pus culture showed *Staphylococcus aureus* in 2 cases, *Streptococcus viridians* in 2 cases and remaining 4 cultures came out to be sterile. In 1 patient out of these 8, who presented with old undisplaced mandibular fracture with airway compromise, tracheostomy was performed before incision and drainage.

**Table 4. Treatment modalities provided**

Treatment given	Number of patients
Conservative treatment with antibiotics	24
Incision and drainage with antibiotics	7
Tracheostomy with incision and drainage	1

## DISCUSSION

The symptoms of Ludwig's angina vary depending upon patient and degree of involvement. Symptoms of Ludwig's angina are swelling, pain in floor of mouth, toothache, fever, and dysphagia. Drooling of saliva, stridor, respiratory distress points towards airway compromise. Diagnosis is made on clinical presentation. Physician should be well aware of the presentation of Ludwig's angina to prevent disease progress which can be life threatening because of its propensity to cause edema and obstruction of airway and this airway compromise is the leading cause of death in Ludwig's angina. If the swelling blocks the airway, patient needs to get emergency medical help. Treatment guidelines include medical management and surgical intervention, if needed. Monitoring and protection of the airway are the most important components of management. Medical management includes administration of Intra venous antibiotics.

Steroids can also help in reducing life threatening soft tissue oedema in selected cases. Culture and sensitivity can be obtained if incision and drainage done, but as it is evident by its definition that Ludwig's angina is a cellulitis not an abscess and in most of the cases, after incision what a surgeon comes across, is a serosanguinous fluid rather than frank pus. The indication for surgical intervention in these cases is usually airway compromise due to excessive soft tissue swelling in the neck and the incision which is quite generous in terms of its extension, i.e. from one angle of mandible to the another angle of mandible usually acts as a release incision, releasing pressure exerted by the swelling on the airway rather than draining pus. Although tracheostomy is considered the gold standard treatment to re-establish proper airway but it is seldom required in Ludwig's angina, as in our study only 1 patient required tracheostomy (Irani *et al.*, 1992; Sethi *et al.*, 1994). The patient was an old case (1-month history) of undisplaced mandibular fracture with mucosal laceration on floor of mouth culminating in submandibular cellulitis and severe airway compromise.

## Conclusion

Ludwig's angina can be life threatening. Prompt and thorough clinical evaluation and definitive cure will considerably improve patient condition and reduce morbidity and mortality. Dental caries and other dental diseases or post dental extraction infections are the major contributors for Ludwig's angina, so proper dental hygiene should be taken care of. Disease manifestation, co-morbid condition at the time of presentation, physician competence, available resources all are crucial factors in decision making of early diagnosis and vigorous management of Ludwig's angina.

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