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Ludwig's Angina: A Case Report

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ABSTRACT

Ludwig's angina is a potentially catastrophic and fatal infection involving the floor of the mouth. The most common cause of Ludwig angina is odontogenic infections, eminently when lower second and third molars are exonerated as the apices of these teeth are located below the mylohyoid ridges. The most feared complication of Ludwig's angina is airway obstruction. Treatment involves early recognition so that an airway can be secured, initiation of antibiotics, and, finally, potential surgical debridement. We describe the case of a 25-year-old male with progressive swelling in the neck, breathlessness and inability to open the mouth. Upon his index admission, he was found to have Ludwig's angina with impending airway obstruction. He required an emergency surgical exploration and extraction of multiple teeth. Although the patient eventually recovered. This case is an example of a severe presentation of Ludwig's angina and the difficulties faced by the Maxillofacial surgeons in managing this condition. Early recognition and rapid intervention are paramount in the management of this serious condition. This article aims to review the current protocols, their efficacy and to evaluate the morbidity of these potentially life-threatening infections at one glance. **KEYWORDS:** Ludwig's Angina, Odontogenic Infections, Space Infection

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INTRODUCTION

Ludwig's angina is a potentially catastrophic and fatal infection involving the floor of the mouth. It was primitively described by Karl Friedrich Wilhelm Von Ludwig in 1836 and later the criteria for diagnosis were described precisely by Grodinsky in 1939 [1]. An indistinguishable clinical condition had previously been termed as Morbus Strangulatorius, Angina Maligne, and Garotillo. All these terminologies point out the choking effect this infection has on its patients.

The most common cause of Ludwig angina is odontogenic infections, eminently when lower second and third molars are exonerated as the apices of these teeth are located below the mylohyoid ridges. Any abscess of these molars is believed to percolate into the mandible and spread into the submandibular space [2]. Ludwig angina originates in the oropharynx but the infection maintains the continuity of spread of infection in the neck rather than lymphatic or hematogenous spread.

Ludwig's angina typically presents with a mixed microbiological flora i.e (aerobic and anaerobic bacteria). Some of the commonly involved bacterial species are Streptococcus Viridans, Staphylococcus aureus, Bhemolytic Streptococcus species, Staphylococcus epidermis,

The literature contains several reports of mortality due to Ludwig's angina and the purpose of this study is to evaluate the morbidity of these potentially life-threatening infections at one glance.

CASE REPORT

A 25-year-old male patient presented to the Department of Oral and Maxillofacial Surgery, Santosh Dental College and Hospital, Ghaziabad complaining of severe pain and progressive swelling below the lower jaw, which developed 1 month after restoration of left lower molar teeth. He started noticing swelling in the lower jaw 4 days before he reported to the department OPD. Pain preceded swelling, for which he visited the local dentist, and exploration of the cavity followed by removal of the temporary restorative material was performed. He then noticed progressive swelling and was referred to a higher center for the treatment of the same. He had no significant past medical history and was taking no regular medications. Initially, he reported difficulty in swallowing and mild difficulty in breathing. On general physical examination, he was febrile, with a temperature of 38.6°C, heart rate of 100 beats per min, respirations of 15 per min, and blood pressure of 120/80 mm Hg. There was no stridor. The cardiac examination was normal. Lung, abdomen, and extremity examinations were unremarkable. There was brawny, tender swelling below the entire mandible extending till 1st neck crease (superoinferiorly) and from the corner

of the mouth till the preauricular region (anteroposteriorly) which was tender on palpation. The overlying skin was erythematous, shiny, stretched, and fluctuant. The patient presented with an interincisal mouth opening of approximately 12mm, Mallampatti score IV. Raised floor of the mouth with tongue elevation was noticed, and inspection of the posterior teeth was not possible due to the trismus. Intra-orally sinus opening was present in the region of lower left second and third molars producing seropurulent discharge from the sinus opening. The patient was provisionally diagnosed with Ludwig's angina.

The severity of his condition and the need for immediate admission for the procedure which was to be undertaken under general anesthesia was explained to the patient in the language he understood. Blood investigations were initiated and the reports revealed marked TLC, serum electrolyte, and CRP protein levels. Intravenous antibiotics, 1.2 gm Augmentin, and 500 mg of metronidazole was administered to the patient. The patient was then planned for incision and drainage followed by extraction of offending teeth on the very next day after admission. Bilateral submandibular and submental incision was placed parallel to the lower border of the mandible. The soft tissues of the neck were surgically decompressed, producing thick, foul-smelling serosanguinous discharge. Through and through gentamycin irrigation was done and corrugated rubber drains were placed at the drainage sites.

The clinical resolution was slow, with persistent discharge from the drain until hospital day 4. The drains were irrigated daily until discharge. With subsequent improvement, the patient was discharged on hospital day 5, and oral antibiotic therapy was prescribed. The right submandibular drain was removed before the discharge of the patient since the incision site did not produce discharge and appeared dry. The patient was recalled for dressing and follow-up every alternate day.



Fig 1. Pre-Operative FIG 2. Swelling area Fig 3. Elevation of Tongue



FIG 4. submandibular sites FIG 5. Drainage sites. Fig 6. pre-operative lateral x-ray

RESULT AND DISCUSSION

What begins as a mild infection can rapidly progress to brawny bilateral induration of the upper neck such a condition is famously known as Ludwig angina. The clinical presentation consists of malaise, dyspnea, dysphagia, bilateral cervical swelling, neck tenderness, dysphonia, elevation of the tongue, hoarseness of voice, restricted neck movement, and stridor suggestive of impending airway obstruction. Odontogenic infections are the most common cause of Ludwig angina, especially when the second and third lower molars are involved. Once the submandibular space is penetrated, infection of this region ensues and causes swelling of this space which leads to superior and posterior displacement of the floor of the mouth and tongue ultimately leading to airway compromise. This represents a condition that can be grossly described as "bull neck appearance". A sharp-witted Diagnosis gives a perceptible image of the case from the history and physical examination. The presence of fever and elevation of the peripheral white blood cell count may help to establish a systemic response connotation with the infection. Blood cultures and CRP Proteins levels should be obtained prior to surgical intervention. A lateral x-ray of the neck may indicate the extent of airway impingement and may demonstrate the presence of gas within the

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soft tissue spaces. Similarly, the chest x-ray study may reveal the intrathoracic extension of infection [3-5]. Establishments of a patent airway, administration of appropriate antibiotics, and surgical decompression become the prime treatment modality in the management of such catastrophic cases. All patients with impending respiratory obstruction need the establishment of a definitive airway [6-8]. Classically, tracheostomy was considered the standard of care for the establishment of a secure airway in Ludwig's angina. Tracheostomy is used most frequently, though cricothyroidotomy is an option in an emergency. The choice of airway maneuvers must be individualized, depending on the judgment and experience of the treating physician. In the pre-antibiotic era, the mortality from Ludwig's angina was greater than 50%. With current therapy, death occurs in less than 5% of cases [8-11]. Early, aggressive treatment with intravenous antibiotics is an essential element of therapy. As with most oral infections, penicillin remains an initial antibiotic of choice and should be administered in high doses (2 to 4 million units IV every 4 h). Clindamycin (600 mg IV every 8 h) can be substituted for penicillin in the allergic patient. Metronidazole (500 mg IV every 6 h) is recommended in addition to penicillin due to increasing resistance among oral anaerobes -especially Bacteroides species. Adequate surgical drainage requires large incisions exposing all infected spaces, and the use of drains. One African center, seeing approximately 25 cases of Ludwig's angina per year, reports the avoidance of tracheostomy with early surgical drainage under local anesthesia[12-13].

S.No	Year	Total No. of Patients	Male Patients	Female Patients	Mortality (No. of Cases)
1.	June 1939- June 1942	20	11	9	2
2.	1945-1979	75	-	-	3
3.	Jan 1963- July 1980	20	11	9	0
4	1981-1986	7	6	1	2
5.	March 1982- Feb 1995	41	10	31	4
6.	Jan 1983- Dec 2000	121	53	68	11
7.	1987-1990	50	32	18	0
8.	Jan 1999- Dec 2009	7	-	-	3
9.	Jan 2007- Dec 2010	15	-	-	2
10	2007	3	2	1	0
11.	Sept 2008	1	1	0	1
12.	Jan 2015-Jan 2016	13	7	6	2
13.	Jan 2017- Dec 2019	11			5

Table-1: The following table depicts important publications on Ludwig's angina with associated mortality

CONCLUSION

The expeditious aggressive use of appropriate antibiotics, surgical drainage, adequate supportive care including appropriate fluid resuscitation, analgesia, nutritional support, airway support and management of underlying systemic conditions as indicated, possibly reckon for a more positive outcome in the management of a whammy condition like Ludwig's Angina.

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