VOLUME - 15, ISSUE - 04, APRIL - 2026 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Anaesthesiology

LUDWIG'S ANGINA: AN ANAESTHESIOLOGIST'S NIGHTMARE

Dr. Nanditha M Pandith*	Junior Resident , Department of Anaesthesia , D Y Patil Hospital , Navi Mumbai*Corresponding Author
Dr. Rushali Ramdas Masal	Junior Resident , Department of Anaesthesia , D Y Patil Hospital , Navi Mumbai
Dr. Rochana Bakhshi	Professor , Department of Anaesthesia , D Y Patil Hospital , Navi Mumbai
Dr. Fayaz M Sultan	Senior Resident , Department of Anaesthesia , D Y Patil Hospital , Navi Mumbai
Dr. Sanam S	Senior Resident , Department of Anaesthesia , D Y Patil Hospital , Navi Mumbai

ABSTRACT **Background:** Ludwig's angina is a rapidly progressive cellulitis of the submandibular and sublingual spaces, frequently resulting in airway compromise. Airway management in such patients remains a significant challenge for anaesthesiologists due to distorted anatomy and restricted airway access. **Case Presentation:** We report a series of four patients with Ludwig's angina secondary to odontogenic infection following molar extraction. All patients presented with trismus, cervical swelling, dysphagia, and features suggestive of impending airway compromise. Airway assessment was limited in all cases. **Management and Outcome:** Awake fibre optic-guided nasal intubation was successfully performed in all patients following adequate airway preparation and sedation. Patients were electively ventilated postoperatively and subsequently extubated after confirmation of airway patency. No perioperative or postoperative complications were observed. **Conclusion:** Awake fibre optic intubation remains a safe and effective technique for airway management in Ludwig's angina. Careful planning, adequate preparation, and experienced anaesthetic management are essential for favorable outcomes.

KEYWORDS : Ludwig's angina; difficult airway; fibre optic intubation; awake intubation; deep neck space infection; airway management

INTRODUCTION

Ludwig's angina (LA), also known as morbus strangulatorius and angina maligna, was first described in 1836 by the German surgeon Wilhelm Friedrich von Ludwig as a rapidly progressive necrotising cellulitis involving the submandibular, sublingual, and submental spaces [1]. The most common etiology is odontogenic infection[2,3]. The condition may lead to airway compromise or extension into deeper soft tissue planes, including the cervical fascia[2–4].

The infection is polymicrobial in nature, involving both aerobic and anaerobic organisms such as Streptococcus viridans, Staphylococcus aureus, beta-hemolytic streptococci, Staphylococcus epidermidis, Bacteroides species, Fusobacterium nucleatum, Peptostreptococcus, and Enterobacter aerogenes[3–5]. In diabetic patients, Klebsiella pneumoniae has been reported as a predominant pathogen in a significant proportion of cases[5,6].

Case Reports

We had 4 cases of Ludwig's Angina caused by odontogenic infection secondary to tooth extraction. A 68 year old female (figure 1) , weighing 60 kgs, a known diabetic since 8 yrs on medications tablet Glimeperide 1mg and Metformin 500 mg with HBA1C of 6.8, presented with complaints of pain, bilateral cervical swelling, dysphagia, trismus, drooling, malaise, fever. 2D echo showed Grade 1 diastolic dysfunction. Patient had a history of 2nd and 3rd mandibular molar extraction. A 33 year old male (figure 2) , weighing 75 kgs with no comorbidities presented with similar complaints predisposed by 3rd Mandibular molar extraction. A 21 year old male (figure 3) , weighing 55 kgs with no comorbidities presented with similar complaints predisposed by 2nd molar extraction.

A 64 year old male , weighing 48kgs, a known diabetic since 8 years on medications tablet Glimeperide 1mg and Metformin 500 mg with a HBA1C of 7 and hypertensive since 5 years on tablet Telmesartan 40 mg, presented with similar complaints predisposed by 3rd molar extraction. 2D echo showed mild concentric Left ventricular hypertrophy and trivial tricuspid regurgitation. Radiological investigations like x ray and CT scan revealed extension of inflammation to deeper soft tissues like cervical fascia.


Figure 1


Figure 2


Figure 3

Pre operative

Mallampati Grade could not be assessed because of difficult mouth opening. Thyromental distance, hyomental distance were also not assessed due to diffuse neck swelling.The associated surgical, anaesthetic risks and procedural details of awake fibre optic guided nasal intubation were explained to the patient.Informed consent and procedure consent for awake fibre optic guided nasal intubation were taken.Airway preparation was done with 4% Lignocaine nebulisation.Oral spray - 10% Lignocaine was administered.Nasal packing was done with 4% Lignocaine packs.The maximum lignocaine dose used was 9mg/kg body weight.

Intra operative

All standard monitors were attached (SPO2, ECG, NIBP) and 18 Gauge IV cannula was inserted on dorsum of either hand.Nasal packs were removed and oxymetazoline drops were instilled.Premedication with glycopyrolate 4mcg/kg and

Fentanyl 1mcg/kg were given.Dexmeditomedine was administered with loading dose of 0.5 mcg/kg followed by maintainance dose of 0.3 -0.4 mcg/kg/hr .Well lubricated fibreoptic scope was introduced through left nostril.In two of our patients base of tongue was swollen and epiglottis not visualised, vocal cords were edematous. following careful adjustments and airway optimization manoeuvres, carina was successfully visualised. Subsequently, the endotracheal tube was advanced under direct vision, ensuring accurate and atraumatic placement.The three male patients were intubated with PVC cuffed endotracheal tube of size 7.0 mm ID and the female patient was intubated with 6.5 mm ID tube.Tube placement was confirmed with capnography and auscultation in all cases.Subsequently Propofol 2mg/kg and Atracurium 0.5 mg/kg were given intravenously.Injection Dexamethasone 8mg was administered intravenously. Dexmeditomidine infusion was given intravenously at 0.5 microgram/kg/hr. Intraoperative period was uneventful.

Post operative

In view of extensive edema patients were shifted to the Intensive care unit with endotracheal tube insitu. In ICU, they were on mechanical ventilation for few hours. Arterial blood gas analysis showed values within normal limits, gradually weaned off, next morning the cuff was deflated for 30 minutes prior to extubation, patients were comfortably breathing around the deflated cuff showing that there was no edema compressing the tracheal lumen. Patients were observed in ICU for total 48 hours, maintained saturation without oxygen, vitals were within normal limits .No adverse events were noted in the ICU as well.

DISCUSSION

Airway management in Ludwig's angina represents a significant anaesthetic challenge due to progressive soft tissue edema, distorted airway anatomy, trismus, and restricted cervical mobility[2–4,7,8]. Evidence from the American Society of Anesthesiologists closed claims database highlights difficult airway management as a major contributor to anaesthesia-related morbidity, with hypoxia and airway obstruction being leading causes of mortality in deep neck space infections[9]. In the present case series, conventional airway techniques were considered unsafe due to restricted mouth opening and the risk of abscess rupture with subsequent aspiration[3,4,7].Tracheostomy was not feasible due to extensive involvement of the anterior and lateral neck regions, resulting in obliteration of anatomical landmarks[7,8]. Under these circumstances, trans-nasal awake fibre optic intubation was selected as the primary airway management strategy and was successfully performed in all patients. This approach allowed maintenance of spontaneous ventilation and facilitated controlled airway management under direct visualization[10–12]. Fibre optic intubation (FOI) plays a pivotal role in contemporary anaesthetic airway management, particularly in anticipated difficult airway scenarios[10–13]. It enables controlled, vision-guided tracheal intubation while preserving spontaneous ventilation. Successful execution depends on adequate airway preparation, effective topical anaesthesia, secretion control, and carefully titrated sedation[13,14]. It remains a key technique endorsed in difficult airway management guidelines issued by the American Society of Anesthesiologists and other international airway societies[9,15].

CONCLUSION

Airway management in patients with Ludwig's angina requires an individualized approach based on the clinical condition of the patient and available institutional resources. In the absence of definitive guidelines, clinical judgment and experience are critical in determining the optimal airway strategy. Awake fibre optic intubation represents a safe and effective technique in such high-risk scenarios, enabling controlled airway management while preserving spontaneous ventilation. The availability of appropriate equipment and the presence of an experienced anaesthesiologist play a crucial role in achieving favorable patient outcomes.

REFERENCES

1. von Ludwig WF. Über eine in neuerer Zeit wiederholt beobachtete Form von Halsentzündung. Med Chir Zeitung. 1836.
2. Moreland LW, Corey J, McKenzie R. Ludwig's angina: Report of a case and review of management issues. Arch Intern Med. 1988;148(2):461–466. doi:10.1001/archinte.1988.00380020103023
3. Parhiscar A, Har-El G. Deep neck abscess: A retrospective review of 210 cases. Ann Otol Rhinol Laryngol. 2001;110(11):1051–1054. doi:10.1177/000348940111001112
4. Britt JC, Josephson GD, Gross CW. Ludwig's angina in the pediatric population. Int J Pediatr Otorhinolaryngol. 2000;52(1):79–87. doi:10.1016/S0165-5876(99)00279-0
5. Brook I. Microbiology and management of deep facial infections and Ludwig's angina. J Oral Maxillofac Surg. 2003;61(4):457–463. doi:10.1053/joms.2003.50096
6. Wang LF, Kuo WR, Tsai SM, Huang KJ. Characterizations of life-threatening deep cervical space infections. Am J Otolaryngol. 2003;24(2):111–117. doi:10.1053/ajot.2003.11
7. Lin C, Yeh FL, Lin JT, et al. Predisposing factors of deep neck infection. J Otolaryngol Head Neck Surg. 2008;37(5):593–597.
8. Boscolo-Rizzo P, Marchiori C, Montolli F, et al. Deep neck infections: A constant challenge. Acta Otorhinolaryngol Ital. 2006;26(5):259–265.
9. Apfelbaum JL, Hagberg CA, Connis RT, et al. Practice guidelines for management of the difficult airway: An updated report by the American Society of Anesthesiologists Task Force. Anesthesiology. 2022;136(1):31–81. doi:10.1097/ALN.0000000000004002
10. Ovassapian A. Fibreoptic endoscopy and the difficult airway. Anesthesiol Clin North Am. 2002;20(4):703–718. doi:10.1016/S0889-8537(02)00018-7
11. Rosenblatt WH, Sukhupragarn W. Airway management in difficult airway. Anesthesiol Clin. 2015;33(2):233–248. doi:10.1016/j.anclin.2015.02.001
12. Cook TM, Woodall N, Frerk C. Major complications of airway management (NAP4). Br J Anaesth. 2011;106(5):617–631. doi:10.1093/bja/aer058
13. Abdelmalak BB, Doyle DJ. Dexmedetomidine for awake fibreoptic intubation. Curr Opin Anaesthesiol. 2010;23(4):458–463. doi:10.1097/ACO.0b013e32833b347c
14. Cabrini L, et al. Awake fiberoptic intubation protocols. Minerva Anestesiol. 2019;85(12):1358–1368. doi:10.23736/S0375-9393.19.13545-7
15. Ahmad I, El-Boghdadly K, Bhagrath R, et al. Difficult Airway Society guidelines for awake tracheal intubation. Anaesthesia. 2020;75(4):509–528. doi:10.1111/anae.14904
16. Law JA, Duggan LV, Asselin M, et al. Canadian Airway Focus Group recommendations. Can J Anaesth. 2021;68(9):1373–1404. doi:10.1007/s12630-021-02016-z
17. Inoue M, et al. Clinical characteristics of deep neck infections. J Infect Chemother. 2021;27(6):857–863. doi:10.1016/j.jiac.2021.02.015
18. Yang W, et al. Deep neck space infections: Current trends. Eur Arch Otorhinolaryngol. 2022;279(3):1123–1133. doi:10.1007/s00405-021-06964-9
19. Boscolo-Rizzo P, Stellin M, Muzzi E, et al. Deep neck infections: A study of 365 cases. Eur Arch Otorhinolaryngol. 2012;269(4):1241–1249. doi:10.1007/s00405-011-1736-5
20. Vieira F, Allen SM, Stocks RM, Thompson JW. Deep neck infection. Otolaryngol Clin North Am. 2008;41(3):459–483. doi:10.1016/j.otc.2008.01.002