

Case Report

Awake tracheostomy and caesarian section for full term female with Ludwig's angina

Minjee Kim^{1*}, Theophile Jean Muhawenimana², Sylvain Mudeli²,
Isaie Ncogoza², David Shaye^{1,2}

¹Department of Otolaryngology, Head and Neck Surgery, Mass Eye and Ear, Harvard Medical School, Boston, Massachusetts, USA

²University Teaching Hospital of Kigali, Kigali, Rwanda

Received: 09 October 2025

Revised: 08 April 2026

Accepted: 02 May 2026

*Correspondence:

Dr. Minjee Kim,

E-mail: minjee_kim@meei.harvard.edu

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Pregnancy is associated with physiologic and immunologic changes that increase the risk of odontogenic infections and their progression to life-threatening conditions such as Ludwig's angina. Ludwig's angina, a rapidly progressive cellulitis of the floor of mouth and contiguous spaces, can compromise the airway and requires urgent multidisciplinary management. We present the case of a 32-year-old woman at 36 weeks of gestation who presented with progressive neck swelling, trismus, and dyspnea due to Ludwig's angina. Given acute airway compromise and inability to tolerate supine positioning, an awake tracheostomy was performed under local anesthesia in a semi-seated position. After securing the airway, urgent cesarean section was completed with delivery of a healthy infant, followed by incision and drainage of the neck abscess. The patient recovered well on intravenous antibiotics, resumed breastfeeding on postoperative day one, and was decannulated by postoperative day 14. This case highlights the elevated risk of severe odontogenic infections in pregnancy, the physiologic changes that further compromise airway reserve, and the importance of prompt multidisciplinary decision-making. Awake tracheostomy, though rarely reported in pregnancy, may be lifesaving when fiberoptic intubation is unavailable, and can facilitate subsequent obstetric and surgical interventions to achieve successful maternal and neonatal outcomes.

Keywords: Awake tracheostomy, Pregnancy, Ludwig's angina

INTRODUCTION

Ludwig's angina is a rapidly progressive cellulitis of the floor of mouth and contiguous deep neck spaces, most commonly arising from odontogenic infection, and can quickly progress to life-threatening airway compromise. This is in particular concern in a pregnant population, as pregnancy-related physiologic changes may further increase both susceptibility to odontogenic infection and the difficulty of airway management.¹⁻⁵ Hormonal, vascular, and immunologic changes during gestation are associated with gingival inflammation, periodontal disease, and dental caries, and upper-airway changes and

reduced respiratory reserve may decrease tolerance of edema and supine positioning.^{6,7}

Cases of Ludwig's angina occurring during pregnancy are uncommon but especially challenging because a rapidly evolving airway emergency may threaten both maternal and fetal well-being.¹⁻³ For these reasons, successful management requires early multidisciplinary coordination among otolaryngology, anesthesiology, and obstetrics, with prompt airway planning, intravenous antibiotics, and the surgical source control when indicated.⁶⁻⁸

Most published reports of Ludwig's angina in pregnancy describe awake fiberoptic intubation followed by urgent delivery and/or incision and drainage.¹⁻⁵ Awake tracheostomy in this setting is rarely reported, particularly when full-term gestation, advanced airway compromise, and limited fiberoptic resources must be addressed simultaneously.¹⁻⁵ Herein, we describe a full-term pregnant woman with Ludwig's angina who required immediate awake tracheostomy followed by caesarean section and incision and drainage at the University Teaching Hospital of Kigali, Rwanda.

CASE REPORT

A 32-year-old female at G3P2 at 36 weeks of gestation presented to the University Teaching Hospital of Kigali with a 3-week history of progressive, left neck and jaw pain. The patient reported preceding dental infection, 24 hours of dyspnea and was unable to lie flat. Exam revealed a firm and tender left neck with fluctuance along the left submandibular space, submental space and extending to the contralateral side. Oral exam demonstrated trismus and floor of mouth edema. (Figure 1). Her vital signs showed a temperature of 37.5⁰C, blood pressure of 132/94, respiratory rate of 28 and oxygen saturation of 93% on room air.



Figure 1: Oral exam of patient on presentation demonstrating trismus and floor of mouth edema.

Based on the clinical presentation, the diagnosis of deep neck space infection with Ludwig's angina was made. Computed tomography (CT) was deferred due to the high acuity of the airway, the patient's inability to lie flat, and radiation exposure. Multidisciplinary communication with otolaryngology, anesthesiology and obstetrics concluded the patient would be moved to the operating room.

The patient was informed of the anticipated sequence of events. The neck and abdomen were prepped and draped simultaneously. Flexible fiberoptic intubation was not

available and prolonged wound care was anticipated. Under local anesthetic and with the patient in a semi-seated position, an awake tracheostomy was performed. Immediately after tracheostomy was secured, general anesthesia was induced, and the infant was delivered successfully by Caesarian-section. Then, incision and drainage of the neck abscess was performed through a submandibular and submental incision, followed by thorough irrigation and packing with gauze (Figure 2).

Postoperatively, the patient was placed on intravenous antibiotics, remained afebrile, and underwent regular packing changes until the wound was dry. Breastfeeding was initiated on POD 1 and the child had a healthy post operative course. On POD 14, once floor of mouth edema had reduced and the wound had improved, the patient was decannulated and discharged home.



Figure 2: Incision and drainage of neck abscess through submandibular and submental incision.

DISCUSSION

There are prior case reports of Ludwig's angina in 3rd trimester pregnancy.²⁻⁵ Osunde et al reviewed 10 cases of Ludwig's angina in pregnant patients, all of whom were managed with incision and drainage under local anaesthetic, without any requiring intubation. There are few case reports of pregnant patients with Ludwig's angina who underwent awake fiberoptic intubation followed by delivery, with two patients presenting at full-term and one patient requiring premature delivery at 32 weeks gestation.^{2,3} Abramowicz et al presented a case of a pregnant patient with Ludwig's angina who required an awake tracheostomy followed by incision and drainage.¹

This case of a full-term pregnant woman requiring an awake tracheostomy and emergency caesarean section highlights the importance of establishing an airway promptly in a multidisciplinary care approach. During pregnancy, changes in immune function and oral health can elevate the risk of odontogenic infections, thus leading to increased risk of Ludwig's angina.² Elevated

levels of estrogen and progesterone can lead to increased vascular permeability and gingival inflammation, predisposing pregnant women to periodontal disease and potential dental abscesses. The acidity in the mouth also increases during pregnancy, which leads to increased cavity formation.² Additionally, immune modulation put pregnant mothers in a relatively immunosuppressed state, which may impair effective clearance of bacterial pathogens. Pregnancy related risks of oral infections may accelerate the progression of dental and deep neck space infections, and Ludwig's angina.

Physiologic changes in pregnancy increase risk of airway compromise in pregnant patients in further ways. During pregnancy pulmonary functional residual capacity decreases. Furthermore, oxygen consumption increases and increase in progesterone leads to increased mucosal edema in addition to generalized neck edema. These effects decrease airway reserve for pregnant patients who may experience other etiologies for airway compromise.

CONCLUSION

The management of Ludwig's angina in a full-term pregnant patient relies on the coordinated efforts of a multidisciplinary team, including otolaryngologists, anesthesiologists and obstetric surgeons. While these rare situations pose an urgent risk to two patients, successful management can save the life of both mother and child.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

1. Abramowicz S, Abramowicz JS, Dolwick MF. Severe life threatening maxillofacial infection in pregnancy presented as Ludwig's angina. *Infect Dis Obstet Gynecol.* 2006;2006:51931.
2. Trahan MJ, Nicholls-Dempsey L, Richardson K, Wou K. Ludwig's angina in pregnancy: a case report. *J Obstet Gynaecol Can.* 2020;42(10):1267-70.
3. Kamath AT, Bhagania MK, Balakrishna R, Sevagur GK, Amar R. Ludwig's angina in pregnancy necessitating pre mature delivery. *J Maxillofac Oral Surg.* 2015;14(1):186-9.
4. Shamim F, Bahadur A, Ghandhi D, Aijaz A. Management of difficult airway in a pregnant patient with severely reduced mouth opening. *J Pak Med Assoc.* 2021;71(3):1011-3.
5. Osunde OD, Bassey GO, Ver-or N. Management of Ludwig's angina in pregnancy: a review of 10 cases. *Ann Med Health Sci Res.* 2014;4(3):361-4.
6. Committee Opinion No. 569: oral health care during pregnancy and through the lifespan. *Obstet Gynecol.* 2013;122(2pt1):417-22.
7. Murphy VE, Jensen ME. Longitudinal changes in upper and lower airway function in pregnancy. *Immunol Allergy Clin North Am.* 2023;43(1):17-26.
8. Bridwell R, Gottlieb M, Koyfman A, Long B. Diagnosis and management of Ludwig's angina: an evidence-based review. *Am J Emerg Med.* 2021;41:1-5.

Cite this article as: Kim M, Muhawenimana TJ, Mudeli S, Ncogoza I, Shaye D. Awake tracheostomy and caesarian section for full term female with Ludwig's angina. *Int J Otorhinolaryngol Head Neck Surg* 2026;12:414-6.