

The EM Educator Series

The EM Educator Series: More Than Just Dental Pain

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Case: A 52-year-old male presents with sore throat and tongue pain. Several days ago he had some dental work, and his past medical history includes diabetes and hypertension. On exam, the floor of his mouth is elevated and indurated. He is febrile and tachypneic.

Questions for Learners:

- 1) What are the early and late presentations of Ludwig's angina, and how do they differ?
- 2) What are the common bugs that cause Ludwig's, and what antibiotics are recommended?
- 3) What is the ED work-up, and who is safe for CT?
- 4) What is the ED management? What are some considerations regarding the airway?

Suggested Resources:

- ✓ **#FOAMed Articles:**
 - [Life in the Fast Lane – Ludwigs Angina](#)
 - [emDocs – Ludwigs Angina](#)
 - [Life in the Fast Lane – ENT Equivocation](#)
 - [emDocs – Awake Intubation](#)
- ✓ **Podcast/Video:**
 - [EM in 5](#)
 - [EMCrit – Awake Intubation](#)
- ✓ **Pubmed Article:**
 - [EM Clin North America – Dental and related infections](#)
 - [EM Clin North America - Infections of the neck](#)

Answers for Learners:

1) What are the early and late presentations of Ludwig's angina, and how do they differ?

- Mouth and throat pain
- Trismus (limited mouth opening)
- Hot potato voice
- Inability to swallow saliva and stridor suggest imminent airway compromise
- Fever, tachycardia, and progression to septic shock
- Bull neck appearance
- Tripod position and respiratory distress
- Tongue appears displaced superiorly and anteriorly, and inability to protrude the tongue
- Tenderness over the neck and throat
- Submandibular "woody" induration, crepitus or tenderness

Patients with Ludwig's angina may initially appear stable, but they have the potential for rapid decompensation. Although not a hard and fast rule, many patients should be intubated to protect their airways as swelling can take a week or more to resolve.

2) What are the common bugs that cause Ludwig's, and what antibiotics are recommended?

In any patient who has suspected Ludwig's angina, antibiotics should be started as soon as possible. The choice of antibiotic therapy should target hemolytic streptococcus as well as anaerobic bacteria. Of note, any patient who is at risk for methicillin resistant staphylococcus aureus or is septic upon arrival should have additional antibiotic coverage on top.

- Immunocompetent Patients
 - Unasyn (3 g IV Q6) or
 - Penicillin G (2 to 4 MU IV Q4-6) + Flagyl (500 mg IV Q6-8) or
 - Clindamycin (600 mg IV Q6-8)
- Immunocompromised Patients
 - Cefepime (2 g IV Q12) + metronidazole (500 mg IV Q6-8) or
 - Imipenem (500 mg IV Q6) or
 - Meropenem (1 g IV Q8) or
 - Zosyn (4.5 g IV Q6)

While steroids may be beneficial in other upper respiratory conditions such as angioedema, asthma, and epiglottitis, there has been no evidence to prove that steroids have any role in the treatment of this disease.

3) What is the ED work-up, and who is safe for CT?

Ludwig's angina is predominately a clinical diagnosis. Laboratory tests are of limited utility, but may include:

- CBC
- BMP
- U&E
- LFT
- Lactate

- CRP

Imaging is performed to evaluate for:

- airway patency
- extent of soft-tissue swelling
- extension of infection
- presence of drainable abscesses and gas
- Underlying dental disease

CT is the imaging modality of choice. The timing and choice of imaging modality depends on the patient's clinical stability, airway patency and their ability to lie flat — ensure the airway is secure first!

4) What is the ED management? What are some considerations regarding the airway?

Your priorities are to:

- Secure the airway early.
- Prepare and be ready for a difficult airway — expect that the patient will require a surgical airway.
- Prevent the development of septic shock and multi-organ failure — give antibiotics early.

Airway compromise due to expanding edema of the soft tissues of the neck is the leading cause of death.

Do

1. Assess your own skill level and decide if you can reasonably intubate the patient.
2. Be comfortable with performing awake nasotracheal intubation.
3. Mentally prepare yourself for a cricothyrotomy
4. Consult early and send the patient to the operating room (OR) if needed

Do NOT

1. Use supraglottic devices or blind intubation techniques as these can make everything worse by irritating the glottic area.
2. Try to look with a laryngoscope. This will probably hurt the patient and worsen swelling.
3. Attempt orotracheal intubation, unless you are in a controlled environment with the appropriate safety nets.
4. Wait until your patient is crashing to consult the appropriate services (maxillofacial surgery, otolaryngology (ENT) and anesthesia).
5. Try to do the intubation unless you are experienced and willing to perform a rescue surgical airway.
6. Let the patient leave the emergency department (ED) without a definitive airway or at least plans to obtain one.

Because Ludwig's angina is rare, there has only been expert opinion and case reports about how these airways should be managed. Awake nasotracheal intubation is preferred because of obstruction of the oropharynx by the tongue (although there have been successful oral intubations).

Induction and paralysis should be considered on a case by case basis. If induction is performed, ketamine is a good option as it is less likely to decrease respiratory drive and allow patients to maintain their own airways. Glycopyrrolate pre-treatment should be considered as edema can cause pooling of

secretions. Finally, if you are performing an awake nasotracheal intubation, you should consider pretreating the nasopharynx with topical lidocaine and phenylephrine.