Ultrasound in Tonsillitis – Submandibular Approach

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Case
A 33-year-old gentleman presents to the ED with a history of fever and sore throat for the past week. Seven days ago, he was diagnosed with tonsillitis and started on Amoxicillin but showed no clinical improvement. Three days ago, his antibiotic was changed to Azithromycin. At his present visit, he is febrile with a complaint of sore throat and muffled voice.

Background
Tonsillitis is an infection or inflammation of the tonsils. The tonsils are areas of lymph tissue on both sides of the throat, above and behind the tongue. They are part of the immune system, which helps the body fight infection. Tonsillitis is usually self-limiting, with most patients recovering within 4 to 10 days. Tonsillitis is usually viral, but can be bacterial e.g., strep throat and in rare cases, a fungus or a parasite can cause tonsillitis. The main symptoms of tonsillitis are a sore throat, and swollen tonsils. Symptoms may also include a fever, a congested or runny nose, swollen lymph nodes, a headache, and trouble swallowing.
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Figure 1: Normal vs Inflamed Tonsils. (Mayoclinichealthsystem.org)

- Peritonsillar Abscess (PTA) is one of the most common deep neck space infection
- PTA is a potentially life-threatening complication if not treated.
- Blind aspiration can lead to eroding or extending of the pus into the deep tissues of the neck, carotid sheath, or posterior mediastinum.

Can PoCUS help?

- The ability of clinicians to reliably differentiate PTA from peritonsillar cellulitis (PTC) by physical examination alone is limited. (2)
- Both conditions can have overlapping clinical presentations and findings; however, these 2 conditions have very different treatment regimens.
- Blind needle aspiration is the typical method of choice to diagnosis a PTA, has also been found unreliable with a reported false-negative rate of 10% to 24% (2)
- So, POCUS can help to differentiate and can also help with needle aspiration!
Endocavity Approach (Intraoral)

Figure 2: Ultrasound of Normal Tonsil using Endocavity Approach. (Google images)

Technique:

- The probe is placed into the mouth against the affected tonsil to visualize any adjacent collection.
- The transducer should be covered with either a condom or a finger from a sterile glove filled with ultrasound gel.
- A topical anesthesia can be applied (spray) to the oropharynx prior to the examination.

Advantages:

- It can aid the efficacy and safety of aspiration by localizing the area of pus and visualizing the relationship of the abscess to the carotid artery.

Disadvantages:

- Not all EM providers have access to an endocavity probe.
- The patient may also have trismus or difficulty opening their mouth wide enough to accommodate the endocavity probe.
- Some patients simply cannot tolerate the oral ultrasound.
Submandibular Approach (Transcutaneous)

**Technique:**

- Curvilinear/linear probe was placed under the patient’s mandible.
- Marker toward the patient’s ear.
- Fanned to locate the tonsils.
- Transverse plane/longitudinal plane (1, 5).

![Submandibular Approach for Scanning Tonsils using High Frequency Probe.](brownemblog.com)

**Figure 3:**

Endocavity vs Submandibular Approach

Comparing the two different techniques, intraoral had a sensitivity and specificity of 91% and 75% while transcervical (TCU) had a sensitivity and specificity of 80% and 81% (4).
PTA PoCUS Pearl

- When there is doubt, evaluate the contralateral side.
- Locate the internal jugular vein and carotid artery and fan the transducer cephalad.
- With the tonsil appearing laterally and adjacent to the hyperechoic oropharyngeal space.
- Ask the patient to swallow.
- Using color Doppler can help identify vascular flow from the internal carotid as well as inflamed tonsillar tissue.
- As most PTAs are superior and posteriorly located, these will appear deep on transcutaneous views.

Figure 4: Ultrasound of PTA using Linear Probe. (SJRHEM)
Figure 5: Ultrasound of PTA using Curvilinear Probe. (SJRHEM)

Figure 6: Another Ultrasound of PTA using Linear Probe. (SJRHEM)
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References