

# SONO case series: peritonsillar abscess

## CASE PRESENTATION

A 36-year-old otherwise healthy man who presents with two weeks of sore throat and associated hoarse voice, followed by 5 days of odynophagia. He denies fevers or chills. He does not smoke tobacco.

No medical or surgical history. No home medications. No allergies.

## TRIAGE VITAL SIGNS

BP: 135/83 mm Hg, heart rate: 61, temperature: 36.8°C, respirations: 16, SpO<sub>2</sub>: 100%.

## PHYSICAL EXAMINATION

Young man resting comfortably in bed. Non-toxic appearing. The patient was noted to have a 'hot potato' voice. Examination apart from intraoral was benign. Oral examination was notable for bilateral erythematous and swollen peritonsillar regions, left greater than right (figure 1).

## LABORATORY DATA

None were drawn.

## POINT-OF-CARE ULTRASOUND

### QUESTIONS

1. What are the indications for performing a point-of-care ultrasound (POCUS) of the peritonsillar region?

Indications for this examination include evaluating for peritonsillar abscess. A peritonsillar abscess typically progresses from tonsillitis to peritonsillar cellulitis and then grows into an abscess. As with most soft-tissue infections, ultrasound can be used as a medium for diagnosing abscesses.<sup>1</sup>

2. Which probe is most ideal in the assessment of peritonsillar region?

Images are obtained by with the use of the endocavitary transducer. Remember to keep your thumb aligned with the marker dot when using the endocavitary probe and to keep it

there throughout your exam to keep yourself oriented while scanning.

3. What views are needed to be sure that the peritonsillar region is adequately evaluated on POCUS?

Two orthogonal views of the area of interest must be fully visualised on ultrasound. Therefore, the tonsils must be visualised in a transverse, or short axis, as well as a sagittal or long axis, plane. In addition, it is imperative that both tonsils are visualised to compare the affected and unaffected side.

4. What are the sonographic abnormalities seen in the left peritonsillar region?

There is a focal collection of pus visualised with a size of approximately 2.5×3.5 cm to a depth of 3.5 cm. As is typical with an abscess, it appears with hypoechoic when compared with surrounding tissue and it can have a heterogeneous echogenicity often with a central anechoic area representing the primary abscess cavity. The echotexture of the abscess is variable based on the composition of the pus filling the cavity.<sup>2</sup> Furthermore, there may be a hyperechoic rim as is appreciated in figure 2 and highlighted in figure 3.

When comparing an abscess to a normal tonsil it is the more marked difference in echogenicity when compared with surrounding tissue, the variable echotexture, the central anechoic centre and the enclosure within a specific area that helps to best distinguish it from regular tonsil tissue. Normal tonsillar tissue has a more homogeneous echotexture that is still hypoechoic to surrounding tissue.<sup>2</sup> This is best appreciated by comparing figure 2 to figure 4.

5. What are some tips when evaluating the peritonsillar region with POCUS?

Use a small amount of gel underneath a protective sheath (condom) for the transducer. Lidocaine gel can then be used on the exterior of the protective sheath to both enhance ultrasound imagery and to begin the process of anaesthetising the soft-tissue. Additionally, the patient can hold a laryngoscope in their mouth to both illuminate the area of interest and to move the tongue out of the way.

6. What are some pitfalls of performing POCUS of the peritonsillar region?

Trismus makes it difficult to insert the endocavitary probe, using a bite block can assist with fitting the ultrasound probe within the patient's mouth. Air may prevent full visualisation of the peritonsillar region, this can occur when the sonographer is not using enough pressure against the posterior



Figure 1 Intra-oral physical exam findings.

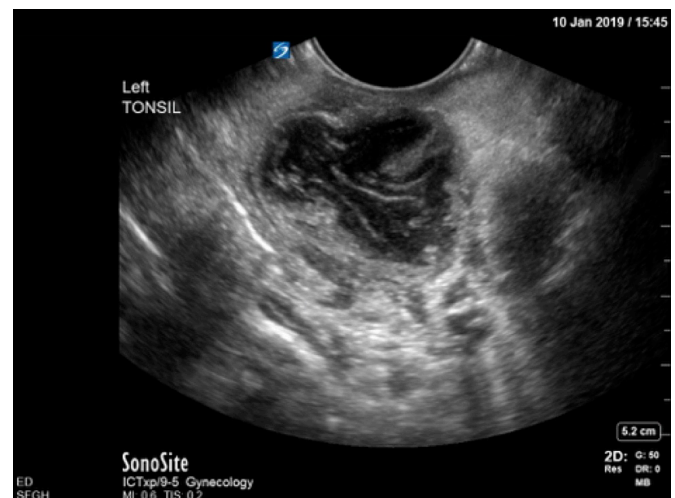
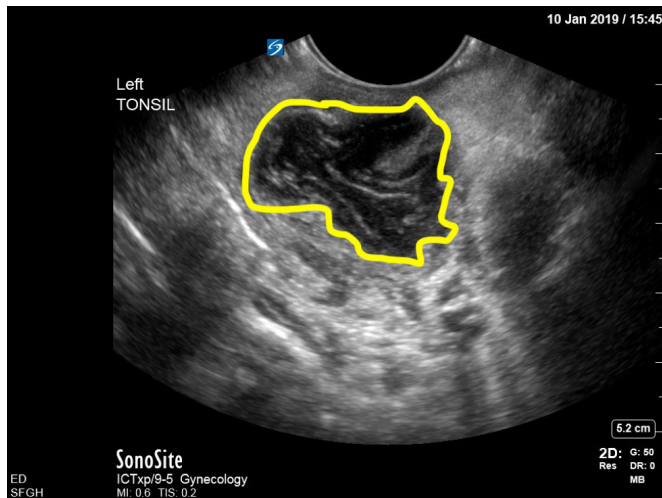


Figure 2 Left tonsil ultrasound-long axis plane. 2D, two dimension.



**Figure 3** Left tonsil with abscess outlined. 2D, two dimension. ED, Emergency Department; SFGH, San Francisco General Hospital.

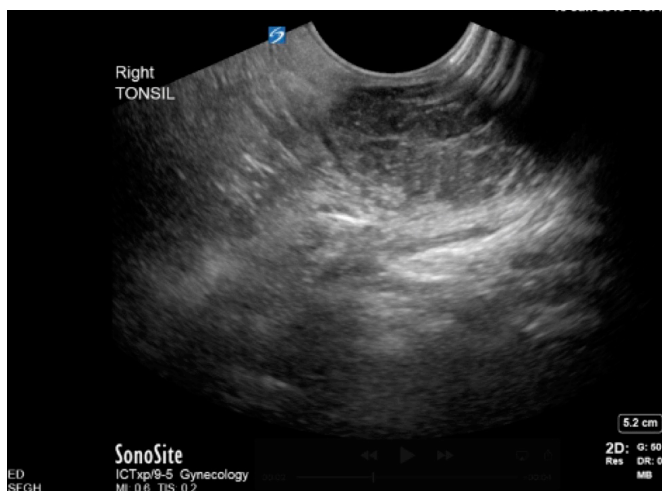
oropharynx. Finally, incorrectly identifying peritonsillar cellulitis as a peritonsillar abscess. Abscesses are defined as anechoic or hypoechoic collections with well-defined hyper-echoic borders.

7. What are the clinical implications and importance of POCUS when assessing soft-tissue?

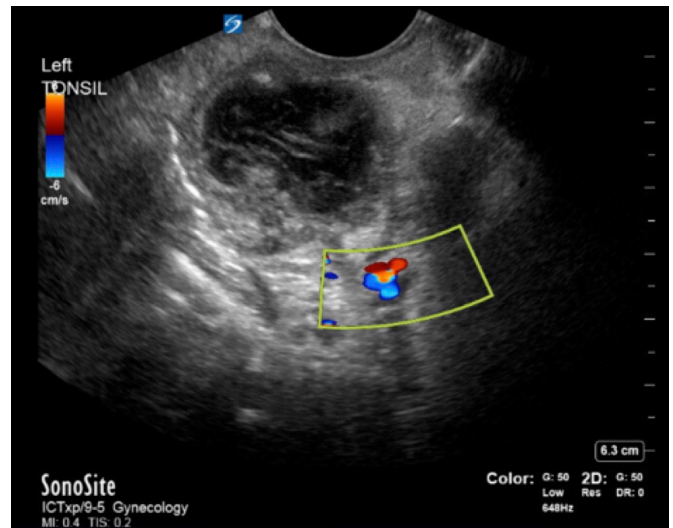
Ultrasound allows practitioners to evaluate the peritonsillar region and decide whether or not to attempt an incision and drainage. Furthermore, the most feared complication of peritonsillar abscess incision and drainage is puncturing the carotid artery. The ultrasound can be used to visualise the depth of the carotid artery and the depth of the abscess cavity. Colour Doppler mode can be used to correctly identify the carotid artery in the far field of the screen (figure 5). In figure 5, the depth of the abscess cavity is 2.5 cm, while the depth of the carotid artery is 4.5 cm. This can be used to safely guide the depth when performing peritonsillar abscess drainage.

8. Why ultrasound?

Bedside, intraoral ultrasound has demonstrated a sensitivity of 89%–95% and specificity of 79%–100% for the diagnosis of peritonsillar abscess when compared with the gold



**Figure 4** Right tonsil ultrasound-long axis plane. 2D, two dimension. ED, Emergency Department; SFGH, San Francisco General Hospital.



**Figure 5** Left internal carotid artery with colour Doppler flow.

standard of CT scan (sensitivity 100% and specificity 75%).<sup>3</sup> Furthermore, ultrasound-guided peritonsillar incision and drainage can prevent carotid artery injury by allowing visualisation and calculation of depth. Finally, using the ultrasound assisted technique (as opposed to using landmarks) has been proven to increase the success of the procedure in the emergency department with decreased requirement for ear, nose and throat surgical consultation.<sup>4 5</sup>

9. Which imaging modality is the most useful, ultrasound versus CT?

Although, CT is more sensitive at identifying abscesses, ultrasound can provide real-time procedural guidance. Ultrasound is also much safer, as patients are not exposed to contrast or ionising radiation.<sup>6</sup>

## CONCLUSION

The patient had an incision and drainage performed with 10 mL of pus was drained. The patient had improvement of his pain and a postprocedure ultrasound confirmed elimination of the abscess.

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**Contributors** We are not using figures/tables from another publication. JRB was the first author of the article and RK was the secondary author.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient consent for publication** Obtained.

**Provenance and peer review** Not commissioned; externally peer reviewed.

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**Handling editor** Simon Carley

*Emerg Med J* 2021;38:730–732.doi:10.1136/emermed-2019-209417

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