

Ultrasound in Emergency Medicine



TRANSORAL POINT-OF-CARE ULTRASOUND IN THE DIAGNOSIS OF PARAPHARYNGEAL SPACE ABSCESS

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Abstract—Background: Parapharyngeal space abscesses (PPSA) are deep-space neck infections that are associated with significant morbidity and, rarely, mortality if not promptly diagnosed and treated. The diagnosis is often difficult, as the clinical presentation can mimic peritonsillar abscesses (PTA). Transoral point-of-care ultrasound (POCUS) may be a useful tool to help distinguish PTAs from other deep-space infections such as PPSAs. **Case Report:** A woman presented to the Emergency Department (ED) with fever, sore throat, trismus, and unilateral tonsillar swelling from a walk-in clinic with a preliminary diagnosis of PTA for drainage. A POCUS performed by the emergency medicine resident in the ED demonstrated normal tonsils. However, it revealed evidence of a PPSA. A computed tomography scan was performed, which confirmed the diagnosis. The patient was admitted to the otolaryngology service for antibiotics and steroids, with subsequent improvement and discharge home. **Why Should an Emergency Physician Be Aware of This?:** In this case, the use of POCUS in the ED avoided an unnecessary invasive procedure, and facilitated the correct diagnosis of an uncommon condition. © 2018 Elsevier Inc. All rights reserved.

Keywords—ultrasound; parapharyngeal abscess; peritonsillar abscess

INTRODUCTION

Blind aspiration of a peritonsillar abscess (PTA) can lead to possible morbidity and dry aspiration if there is no

abscess present (1). Transoral point-of-care ultrasound (POCUS) can confirm the presence of PTA prior to attempting drainage (2). We present the case of a patient who had a parapharyngeal space abscess (PPSA) diagnosed with transoral POCUS, despite having classic symptoms of a PTA. To our knowledge, there have been no published case reports of an emergency physician using transoral POCUS to diagnose PPSA.

CASE REPORT

A 44 year-old woman was referred to the ED from a walk-in clinic for drainage of a PTA. She experienced a one week history of sore throat that became progressively worse. In the two days prior, she described trismus, fevers, and difficulty swallowing. She had no significant past medical history, no allergies, was taking no regular medications, and she was a nonsmoker. Her vital signs included a heart rate of 100 beats/min, blood pressure of 122/74 mm Hg, respiratory rate of 16 breaths/min, oxygen saturation of 98% on room air, and temperature of 37.9°C. On examination, she had significant swelling of her right tonsil, uvula, and posterior oropharynx. Her uvula was deviated toward the patient's left (Figure 1) and there was some dysphonia. On neck examination, no masses were felt, but tenderness of her right anterior neck was noted. There was no respiratory distress, stridor, or drooling. Her white blood cell count was elevated at



Figure 1. Photograph of patient showing fullness of right peritonsillar area (#) with uvula deviation to the left (*).

$13.1 \times 10^9/L$ (normal 4–11), and the remainder of her routine bloodwork was normal.

A transoral POCUS was performed in the ED by the emergency medicine resident during his POCUS fellowship training and proctored by the fellowship director. The patient's oropharynx was anesthetized using a lidocaine spray. While in a seated position, a sheathed 7.5-MHz endocavitary transducer (Esaote North America, Fishers, IN) was inserted into the midline of the patient's mouth in the transverse orientation and advanced at an angle until it contacted the anterior pillar of the right tonsil (3). Once the tonsil was identified, the transducer was swept cephalad and caudad to evaluate the entire tonsil and surrounding structures. No evidence of a PTA was seen during a complete sweep of her right tonsil. However, lateral to the patient's right tonsil, a collection of fluid was noted in the parapharyngeal space (Figure 2). It measured approximately 3 cm by 1 cm. The patient was given intravenous antibiotics, steroids, and analgesia.

A computed tomography (CT) scan ordered by the emergency physician demonstrated an asymmetric soft tissue collection approximately 3 cm in width in the right oropharynx (Figure 3). It extended as far inferiorly as the piriform sinus. The radiologist confirmed that it was indicative of a developing abscess.

The patient was referred to the otolaryngology service, which performed a flexible nasal laryngoscopy. Significant swelling was noted in the area of the right tonsil in the lateral pharyngeal wall. No drainage of this area

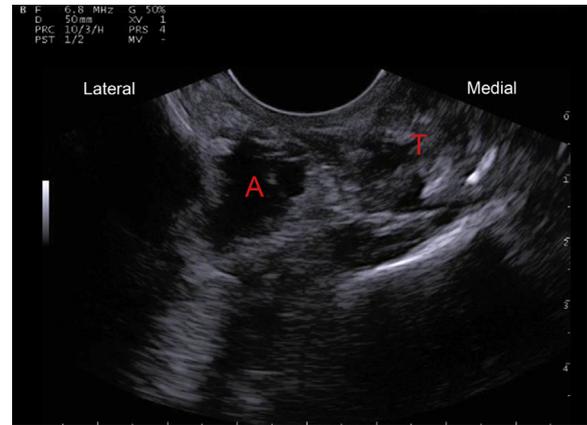


Figure 2. Transoral ultrasound showing normal-appearing right tonsil (T), but a hypoechoic area lateral to the patient's right tonsil suggestive of a parapharyngeal abscess (A).

was attempted, and the patient was continued on intravenous antibiotics and steroids during a 3-day admission. On the day of discharge, another flexible nasal laryngoscopy was performed, which demonstrated a significant reduction of the swelling, and the uvula had returned to midline. Her voice had returned to normal. She was discharged home from the hospital with a 2-week supply of oral antibiotics. Steroids were discontinued after a 3-day course.

DISCUSSION

Acute pharyngitis and tonsillitis are common ED presentations (4). Despite the widespread use of antibiotics, these infections can evolve into deep-space neck infections. The incidence of deep-space neck infections seems to be increasing (5). The peritonsillar, retropharyngeal, and parapharyngeal spaces border the oropharynx and are the most common sites for potential spread of infection (6). In adults, parapharyngeal abscesses are the second most common type of deep-space neck infection, after PTAs (7). Whereas pharyngitis and tonsillitis are the most common predisposing causes, PPSAs have been reported without associated adjacent infection (8).

This case demonstrates the difficulty in distinguishing patients with PPSAs from more common oropharyngeal infections such as PTAs. Symptoms such as fever, sore throat, and dysphagia are common to both conditions (8). Whereas patients with PTA will commonly have an enlarged tonsil with uvular deviation, patients with PPSA will often have medial tonsil displacement and a painful lateral cervical mass (8). In our patient, the medial tonsil displacement was initially mistaken for an enlarged tonsil from a PTA.

In this case, the clinical examination was consistent with a PTA. However, transoral POCUS was performed

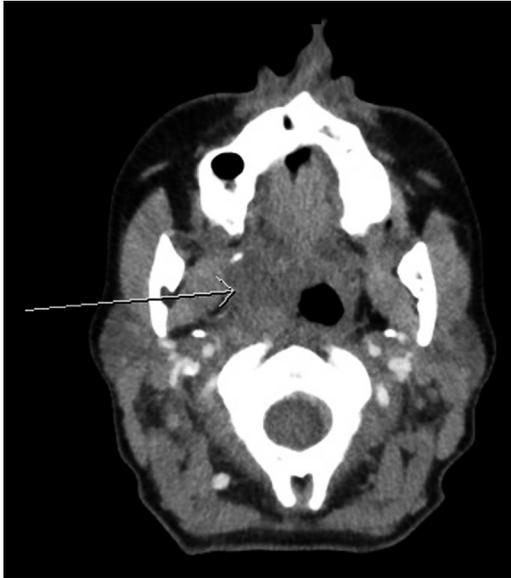


Figure 3. Computed tomography demonstrating the right-sided parapharyngeal abscess (arrow).

to confirm the diagnosis prior to an attempt at drainage. POCUS is superior to clinical examination for the diagnosis of PTAs, and can help reduce unnecessary procedures (9). In a prospective randomized controlled trial of 28 patients with suspected PTA, patients randomized to POCUS had higher diagnostic accuracy (100% vs. 64%), more successful aspiration (100% vs. 50%), lower specialist consultation rate (7% vs. 50%), and lower CT use (0% vs. 35%) (2). On ultrasound, a normal tonsil appears as a homogenous oval-shaped object with a solid-organ texture (Figure 4). A PTA appears as an anechoic (black) or hypoechoic (dark) region within the solid tonsil (Figure 4).

In our case, the POCUS examination revealed a normal-appearing tonsil, however, an abscess was identified more laterally. This helped to avoid an unnecessary invasive procedure, and also prompted the treating physician to order the confirmatory CT scan. Contrast-enhanced CT scans of the neck remain the most commonly used method to confirm the diagnosis of PPSAs, and are highly accurate (10).

It is important to distinguish PTAs from PSSAs, as they often require different treatment and have different complications. Although complications from PTAs are rare, PPSAs can result in significant morbidity and, occasionally, mortality (6). The most common complication is airway obstruction, with other reported complications including mycotic aneurysm, internal jugular vein thrombosis, and extension of infection leading to mediastinitis (6,11–13). Whereas drainage of a PTA can be done at the bedside using a needle aspiration or scalpel incision and drainage, PPSAs requiring drainage must be performed in the operating room under general anesthesia (14). More recently, nonsurgical management with admission for intravenous antibiotics and close observation has been demonstrated to be an effective option for some patients (15). Given the relatively small abscess size, lack of airway compromise, and clinical improvement with steroids and antibiotics, the otolaryngologist opted for conservative management in this case.

This case suggests that transoral POCUS may be a useful method for identifying PPSAs in the ED. Ultrasound has been used previously in the diagnosis and management of PPSAs. There have been reports of using intraoperative ultrasound to locate PPSAs, performing a neck ultrasound to diagnose PPSAs, and using transoral ultrasound to evaluate parapharyngeal space tumors (16–18).

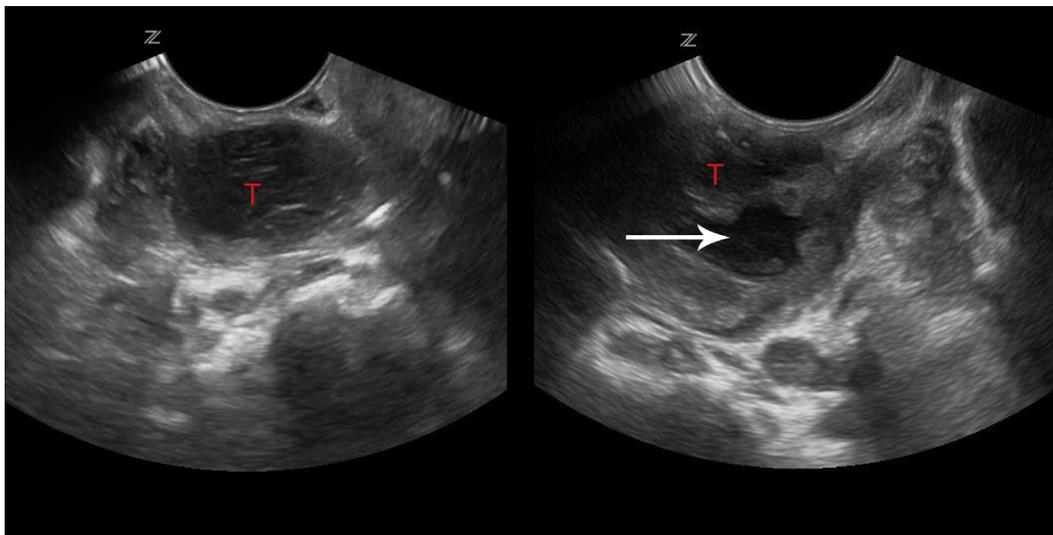


Figure 4. Comparison of a normal tonsil (T) (left) and a tonsil containing a peritonsillar abscess (right). Note the anechoic (dark) area within the tonsil, caused by the abscess cavity (arrow).

To date, we are not aware of any reports on the diagnosis of PPSA by transoral POCUS in the ED.

WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?

PPSAs are difficult to diagnose in the ED and can present in a manner similar to PTAs. In this case, we demonstrated that transoral POCUS can be used to help diagnose PPSA and help distinguish it from PTA, leading to early recognition and treatment. When patients present with signs of PTA but have normal-appearing tonsils on POCUS, we suggest scanning the area lateral to the tonsil to evaluate for signs of PPSA. Larger studies are needed to determine a protocol for the assessment of PPSAs and the accuracy of POCUS for the diagnosis of deep-space neck infections.

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