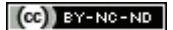


Diagnosis of Retropharyngeal Abscess using Point of Care Ultrasound

GHADEER ALSAIF¹, HASSAN ALMAATEEQ², AUDAY ALKHONAIZI³



ABSTRACT

Point Of Care Ultrasound (POCUS) is a new concept and practice recently introduced into the clinical practice of medicine. It is commonly used by emergency and critical care physicians to help identify clinically significant as well as life-threatening pathologies. Retropharyngeal Abscess (RPA) can be presented in vague ways, and bedside Ultrasonography (USG) can aid in quick diagnosis, however it has been very rarely reported. This is a case report of a patient who presented with sore throat, fever and peritonsillar discharge. Neck USG showed a complex multi-loculated collection lateral to the thyroid gland and posterior to the right carotid artery (transverse view), a linear collection with anechoic center between the pharynx and cervical spine (longitudinal view), and a swirling phenomenon with respiration and swallowing as well as with carotid pulsation. CT scan showed retropharyngeal abscess with mediastinal extension. Possible aetiologies include spread from tonsillitis, dental abscess, pharyngeal or upper respiratory infection. It was treated with antibiotics and surgical drainage. The patient made a good recovery, and the collection resolved on repeat CT imaging.

Keywords: Diagnostic imaging, Parapharyngeal abscess, Pharyngitis, Ultrasonography

CASE REPORT

A 41-year-old lady presented to the emergency department with a one-week history of sore throat with reduced oral intake and odynophagia. She had no other medical history apart from recent uncomplicated tooth 48 extraction.

She takes no regular medications. On initial examination, right tonsillar swelling was seen, and Amoxicillin 500 mg three times a day was given for a week. A few days later, she was followed-up in the ENT clinic where she had worsening symptoms. Clindamycin 300 mg 6 hourly and Prednisolone 40 mg once daily were prescribed but without improvement. She presented a week later with ongoing symptoms. She had a temperature of 38°C, pulse rate of 125, blood pressure 125/70 and oxygen saturation of 99% on air. Examination revealed foul-smelling purulent discharge from inflamed and swollen right tonsil and peritonsillar area with no trismus. Extracted tooth socket was healing normally.

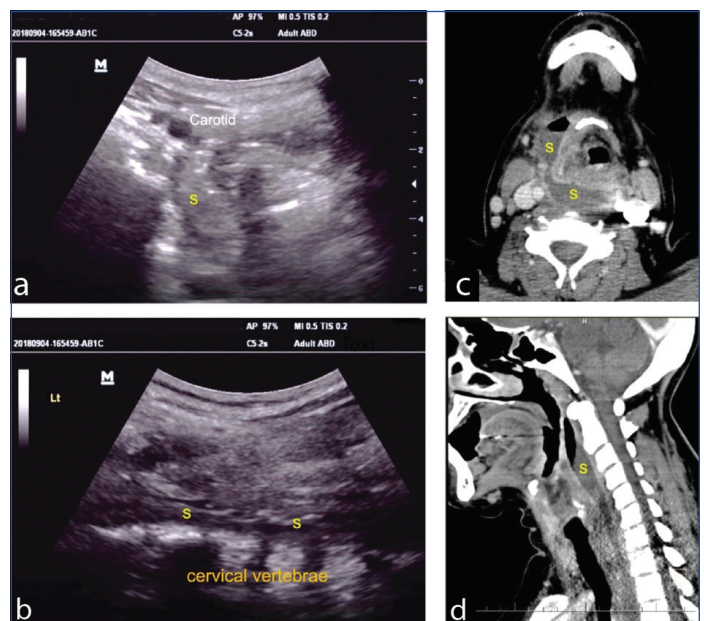
A bedside USG of the neck using the linear/vascular probe showed on transverse view a complex multi-loculated collection on the right aspect of the thyroid gland posterior to the right carotid artery [Table/Fig-1a]. On a longitudinal view of the neck, there was a linear streak of a heterogeneous collection with anechoic center embedded between the pharynx and cervical spine [Table/Fig-1b]. The collection showed a swirling phenomenon with respiration and swallowing as well as with carotid pulsation. That was highly suspicious of RPA.

The CT scan confirmed complex RPA extending to the paratracheal area and right lung apex and reaching posterior mediastinum till the level of the gastroesophageal junction [Table/Fig-1c,d]. A diagnosis of descending necrotising mediastinitis was confirmed. The exact aetiology was not clear, but possible aetiologies spread from recent tonsillitis, missed dental abscess, pharyngeal or upper respiratory tract infection.

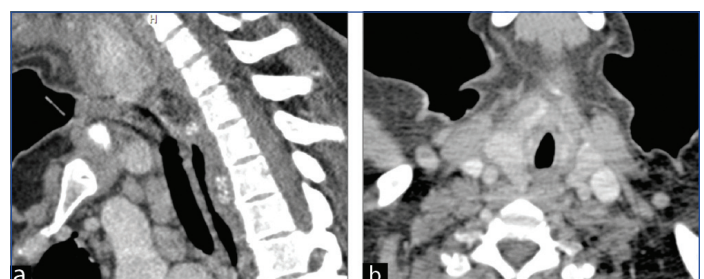
A surgical incision and drainage of the RPA and posterior mediastinal space was done and intravenous Piperacillin/Tazobactam administered. The patient made a good recovery, and the infection resolved on repeat CT imaging [Table/Fig-2].

DISCUSSION

Deep neck infections are infections in the potential fascial planes and spaces of the head and neck. Potential aetiologies of these



[Table/Fig-1]: a) Transverse view of the right side of neck lateral to thyroid gland demonstrating the carotid artery with pus collection behind (S). b) Longitudinal view of the neck showing the pus (S) anterior to the cervical vertebrae. c) Axial CT image of the neck showing the parapharyngeal pus (S) extending to the retropharyngeal space. d) Sagittal CT image showing the pus collection (S) anterior to the spine and posterior to pharynx.



[Table/Fig-2]: CT scan after antibiotics and drainage showing resolution of the retropharyngeal abscess on sagittal (a) and cross-sectional (b) planes.

infections include tonsillar, pharyngeal infections, dental abscesses, oral procedures, pharyngeal cavity trauma, thyroiditis, and suppuration of necrotic cervical lymph nodes. Dental infection

are the most common cause of deep neck infection (48.6%) followed by peritonsillar infections (19.7%) [1], both of which may be implicated in this case. The complex anatomy and the deep location make diagnosis and treatment of infections in this area difficult, and this may lead to life threatening complications such as airway obstruction, septic shock or mediastinitis. RPA is a major type of deep neck infections that occurs most commonly in children between the ages of two and four years but can occur in other age groups from neonates to adults is a potentially serious condition. Prompt diagnosis using imaging is very useful to confirm initial suspicion of the condition and avoid delay in diagnosis of RPA [1].

This is a case report of a patient with RPA with POCUS key features. This obviously has important clinical implications as it increases physician's knowledge and skill set to diagnose or support suspicious conditions. RPA is a potentially serious condition, and prompt diagnosis using simple bedside imaging modality like USG is very useful to confirm initial suspicion of the condition and avoid delay in diagnosis, thereby initiating treatment promptly. Presentation of RPA can be vague and indistinguishable from pharyngitis, upper respiratory tract infection, or epiglottitis, and at late stages can obstruct the upper aerodigestive tract [2]. Because its features are not specific, making the diagnosis of RPA requires imaging confirmation.

The most common used imaging modalities are lateral neck plain X-ray and CT with intravenous contrast of the neck. The choice of imaging modality (or no imaging) is usually based on the level of suspicion, symptom severity, patient stability, patient age, and available resources. CT scans are generally preferred because of their superior resolution and ability to differentiate it from other conditions, evaluate its size and extension to contiguous spaces and show non-radiopaque foreign bodies serving as a nidus for infection. It also delineates surrounding anatomy to plan surgical drainage. Complications such as vertebral osteomyelitis, jugular venous thrombosis, or mediastinal extension can be detected [3]. A lateral neck radiograph may be the initial study, if there are no signs of airway compromise and the suspicion is low whereas if there is high suspicion, CT with intravenous contrast is the commonly preferred study. In children with respiratory distress, imaging should be avoided as it may delay the emergency management of the airway. An examination under anaesthesia in theatre may be needed.

Nonetheless, there are problems with X-ray and CT in these patients. Both usually require transporting patients (who can be very ill) to the imaging department for proper study. A radiograph can be done at the bedside but can be suboptimal and undiagnostic due to the high false-positive results in children. The film should be a perfect lateral obtained during inspiration with the neck held in extension. Expiratory or flexion radiographs may cause spurious widening of the retropharyngeal tissues, especially in infants and younger children [4]. CT exposes patients (most of whom are children) to radiation, and patients may require sedation or calming techniques to be able to do the scan properly.

USG has many advantages over other modalities. It is non-invasive, readily available, and well-tolerated by children. Sedation or anaesthesia is rarely required. It is useful in the evaluation of

neck masses in children [5]. USG of the neck is a well-established modality for diagnosing peritonsillar abscesses in the emergency department. It has been well known to use the transvaginal probe through the oral cavity looking for abscess behind the tonsils. Despite all these advantages, USG has not received enough attention in diagnosing RPA among POCUS community, probably due to the rare incidence of this entity in the adult population. There are only rare case reports of POCUS use in diagnosing retropharyngeal or parapharyngeal abscess [6].

Early uncomplicated pharyngeal or tonsillar infection cannot be differentiated from RPA clinically or radiographically. USG can be performed to determine if a CT-detected neck mass is solid, compatible with adenitis, or complex, suggesting abscess [7]. Abscesses have typically the sonographic appearance of lobulated, complex masses with partially anechoic center [8], thereby allowing early diagnosis of the suppurative phase of retropharyngeal infection and early antibacterial treatment. POCUS guidance can also aid in transoral and intraoperative aspiration and drainage of RPA [9].

USG however have some limitations. It is operator-dependent and thus assessment may vary based on the operator skills. CT imaging are necessary for better localisation of deep seated infections as these infections are not accessible by USG. It does not completely define the extension of the infection.

CONCLUSION(S)

POCUS is a new concept and practice recently introduced to the practice of medicine. It is commonly used by emergency and critical care physicians to help identify clinically significant as well as life-threatening pathologies. RPA is rarely discussed in POCUS. Simple USG with the linear probe to the neck looking for pus collection that swirls would make a significant change in the diagnosis and management of non-resolving sore throat in the setting of high suspicion for RPA.

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