Case Report

The use of bedside ultrasonography in the evaluation of a neck mass

Abstract

A 53-year-old man presented to the emergency department (ED) with neck swelling, shortness of breath, and a change in the sound of his voice. Physical examination revealed an afebrile man speaking in 2- to 3-word sentences with a firm, nontender, nonerythematous mass on the right side of his neck. A bedside ultrasound demonstrated a homogenous mass with internal vascular flow. This constellation of findings was felt to be most consistent with a malignancy. Nasopharyngoscopy confirmed a near obstructing supraglottic mass, and the patient underwent an emergent tracheostomy. A lesion in the head and neck region can cause airway compromise, and, if the patient displays any evidence of respiratory decompensation, rapid evaluation is essential. Bedside ultrasonography facilitates assessment of space occupying lesions in the neck without removing the patient from a monitored setting, making it an optimal tool for the unstable patient who presents to the emergency department.

A 53-year-old male smoker presented to the emergency department (ED) with progressively increasing swelling to the right side of his neck for 3 weeks. He also described progressively increasing shortness of breath and a change in the sound of his voice. In addition, he complained of a subjective fever, sore throat, and productive cough. He denied any difficulty in tolerating secretions.

The patient was afebrile, with a pulse of 98 beats per minute, a respiratory rate of 19 breaths per minute, and 98% oxygen saturation while breathing ambient air. The patient was speaking with a hoarse voice, in 2- to 3-word sentences, with no drooling appreciated, no swelling in the oropharynx or sublingual region, and a normal appearing posterior oropharynx. There was a firm, nontender, nonerythematous fixed mass on the right side of his neck. The mass was located lateral to the midline, anterior to the sternocleidomastoid muscle, and distorted the natural contour of his neck (Fig. 1).

A bedside ultrasound was performed using a high-frequency linear transducer, which revealed a 5.2 × 4.5 cm well-circumscribed homogenous mass with internal flow (Figs. 2 and 3). Nasopharyngoscopy revealed an obstructing supraglottic mass. The patient was taken to the operating room for an emergent tracheostomy.

Establishing the etiology of a neck mass is critical to ensure appropriate treatment. If imaging is required, selecting the appropriate modality is important. Radiologic evaluation of the airway can include x-rays, ultrasonography, computed tomography, and magnetic resonance imaging, with bedside ultrasonography (BUS) becoming increasingly used by emergency physicians. In the ED, BUS can be used to rapidly diagnose potentially life-threatening conditions while the patient remains in a monitored setting. Its role in the ED should be to identify characteristics of the neck mass; this information can then be used to guide further management.

The etiology of a neck mass includes a variety of diagnoses ranging from benign to emergent. The differential diagnosis varies by age and can be divided into 3 categories: congenital, infectious, and neoplastic. A congenital neck mass is the most common noninflammatory neck mass in children. Examples include branchial cleft cyst, teratoma,
dermoid, and thyroid cyst. Understanding the neck anatomy is important because branchial cleft cysts are more likely to be located along the anterior border of the sternocleidomastoid muscle, whereas a thyroglossal cyst will be near the hyoid bone close to the midline. Sonographically, these cysts usually appear anechoic with well-defined borders and no internal flow, although occasionally debris may be noted within the cyst.

In the adolescent population, neck masses are usually secondary to an infection or neoplasm. Sonographically, reactive lymph nodes appear as elongated ovoid structures with smooth borders and an echogenic hilum [1].

Lateral neck masses in adults are predominately neoplastic or infectious in origin. The most common neoplastic cause is squamous cell carcinoma, especially in an adult with a history of smoking. Sonographically, a neoplasm has a homogenous echogenic appearance with vascularity within the structure as opposed to an abscess, which exhibits no internal flow. An abscess may have a variety of appearances, although often it will appear as an anechoic area with internal debris. Reactive lymph nodes can also cause a neck mass, and these have the potential to lead to abscess formation [2]. A neck mass may also be caused by lymph node metastases. These lesions have distinct ultrasonographic criteria including a round shape, a diameter of 8 mm or greater, and loss of the echogenic hilum secondary to necrotic tissue [3,4].

This patient had an insidious onset of disease, and given his smoking history, the lateral neck mass was likely neoplastic, although an infectious etiology was also possible. His physical examination findings indicated a compromised airway, and further imaging would have to be carefully selected. Bedside ultrasonography was rapidly performed, and the combination of an echogenic appearance along with internal vascularity helped establish that the mass was a nondrainable structure most consistent with a malignancy rather than an abscess. The patient was taken emergently to the operating room for placement of a definitive airway. Subsequent pathologic examination revealed a supraglottic squamous cell carcinoma for which the patient underwent radiation therapy and chemotherapy. Despite initially successful treatment, the patient had aggressive recurrence of his malignancy and ultimately died.

Cindy Chavez MD  
Eitan Dickman MD  
Lawrence Haines MD, MPH  
Department of Emergency Medicine  
Maimonides Medical Center  
Brooklyn, NY 11219, USA

E-mail address: cchavez@maimonidesmed.org


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