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Case Report

Unilateral Neck Mass Causing Dysphonia

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Abstract

This report presents the case of a 39-year-old male with a history of hoarseness, odynophagia, and dyspnea. Initial examination revealed right vocal fold hypomobility with inter-arytenoid erythema. Three years later, the patient re-presented with similar symptoms in addition to breathy speech and right-sided otalgia. CT of neck and chest revealed asymmetric enlargement of the right piriform sinus, a 2.1 cm air density at the right posterolateral trachea with mass effect on the right lateral esophageal wall. Despite suggestive symptoms, laryngoscopy and CT scans did not detect any neoplasm, making aerodigestive malignancy unlikely. A laryngocele was unlikely given that most present are contained within the larynx or the cervical tissues, unlike this mass. The presence of tracheal diverticulum, a rare condition, was identified as etiology based on the patient's symptoms and imaging findings. Tracheal diverticula are congenital or acquired, with the latter often presenting in the right posterolateral trachea at the thoracic inlet. Symptoms can vary widely but may include dysphagia, chronic cough, dyspnea, or dysphonia, as seen in this case because of recurrent laryngeal nerve compression. Diagnosis typically involves CT imaging of the neck and chest, with bronchoscopy and barium esophagogram as supplementary diagnostic tools. Treatment options range from observation and symptom management to surgical resection, depending on symptom severity and patient preference. In this case, the patient was referred for evaluation but declined follow-up. Understanding the clinical presentation and diagnostic approach to tracheal diverticula is crucial for accurate diagnosis and appropriate management of affected individuals.

Keywords: Diverticulum; Neck mass; Dysphonia; Dysphagia; Odynophagia; Tracheal anomalies

CASE PRESENTATION

A 39-year-old male with a history of smoking presented to otolaryngology clinic with three years of hoarseness, odynophagia, and dyspnea. He also reported left sided globus sensation and dysphagia to solids and liquids which improved with right neck rotation. Flexible laryngoscopy revealed right vocal fold hypomobility with arytenoid and inter-arytenoid erythema. Patient re-presented three years later with similar symptoms and new onset breathy speech and right sided otalgia with swallowing. Flexible laryngoscopy identified right true vocal fold immobility with compensatory vocal fold hyperfunction. In office-bronchoscopy was normal.

A contrasted neck Computed Tomography (CT) scan showed asymmetric enlargement of the right piriform sinus and laryngeal ventricle, atrophy of the right posterior cricoarytenoid muscle, bilateral level 2 lymph nodes measuring 1.5 cm, and widening of the space between the internal jugular vein and internal carotid artery. A chest CT scan with contrast showed a 2.1 cm air density at the right posterolateral trachea at the level of the thoracic inlet. The air density resulted in fat effacement within the right tracheoesophageal groove and mass effect on the right lateral wall of the esophagus (Figure 1).

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What is your diagnosis?

a) Tracheal diverticulum, b) Laryngocele, c) Esophageal neoplasm, d) Laryngeal neoplasm

Diagnosis: A (Tracheal diverticulum)

DISCUSSION

The patient's presenting symptoms of dysphagia, odynophagia, and otalgia may suggest aerodigestive malignancy. However, the absence of detectable neoplasm on laryngoscopy or CT neck and chest makes this an unlikely diagnosis. This patient's lymph nodes in level two were less than 1.5 cm [1,2] which is less concerning for metastatic malignancy. Laryngocele is an air-filled dilatation of the laryngeal saccule, the space between false and true vocal cords. It can be internal when contained within the larynx medial to the thyrohyoid membrane, external when it presents in cervical tissues, or mixed if it occurs intralaryngeal and cervical. The location of the air-filled diverticulum within the trachea below the thyrohyoid membrane precludes laryngocele as potential diagnosis.

The posterolateral tracheal air density at the right tracheoesophageal groove indicates tracheal diverticulum as etiology for the patient's symptoms. Tracheal diverticula are air-filled cysts that present as one or more invaginations of the tracheal wall. These are rare, with an incidence of 2.4%, and are almost always found on the right posterolateral region (97.1%) as opposed to the left (2.9%) [3,4]. Differences in laterality may be due to the left-sided presence of aortic arch and esophagus, while the right side of the trachea is relatively unprotected and prone to distention.

Tracheal diverticula are classified based on origin. Congenital diverticula typically occur either 4-5 cm below the vocal cords or just above the carina. A narrow tracheal connection arises from defects in endoderm differentiation during embryonic development [4]. Vestigial supernumerary lungs or abnormal high divisions of the primary lung bud can also result in diverticula formation. Congenital diverticula are often mucus filled [4,5]. In contrast, acquired diverticula can occur at any location within the trachea, often in the posterolateral trachea at the thoracic inlet. Acquired diverticula are thin walled with wide openings and involve distention of the respiratory epithelium only (pseudodiverticula) [4]. Acquired tracheal diverticula may develop from surgery, tracheomalacia,

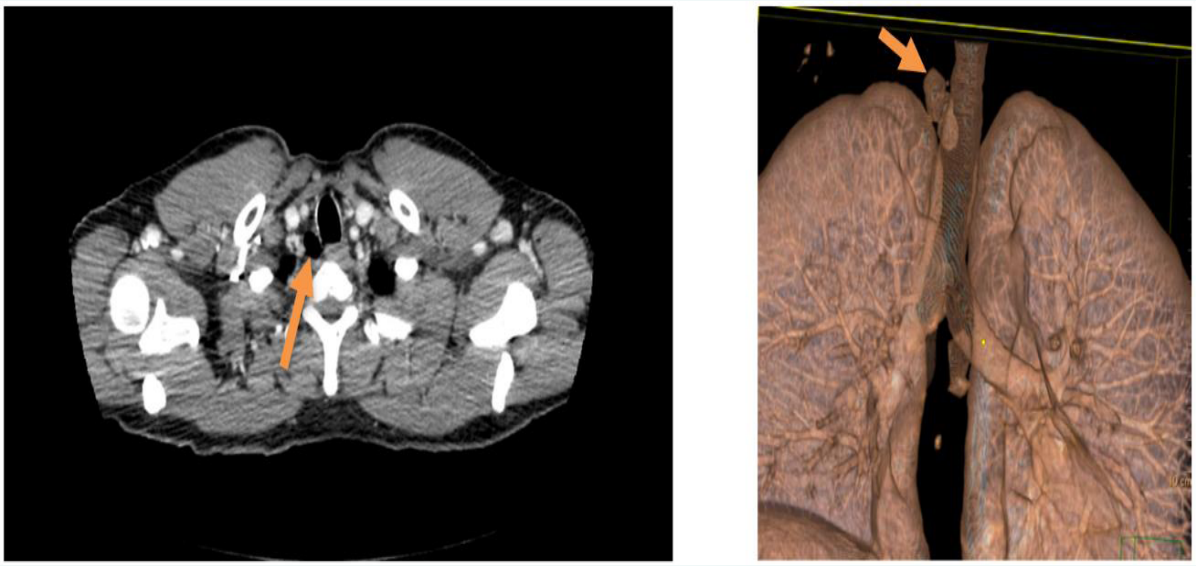

Figure 1 : Axial neck CT scan at the level of the thoracic inlet (left) and 3D reconstruction of chest CT (right) showing an air-filled cyst in the right posterolateral trachea (orange arrows).

or increased intraluminal pressure with weakened tracheal musculature, such as from chronic cough or obstructive lung disease with emphysema [4].

Most tracheal diverticula are asymptomatic and incidentally found in imaging. However, diverticula can present with chronic cough, dyspnea, stridor or recurrent tracheobronchitis. Dysphagia, odynophagia, neck pain, hoarseness, hemoptysis, choking, hiccups or burping may also be presenting symptoms [3,4]. Patients may have obstructive respiratory pattern in pulmonary function tests [3]. Tracheal diverticula can cause sudden onset dysphonia due to compression of the recurrent laryngeal nerve at the tracheoesophageal groove [3,6-8]. This patient's right vocal cord immobility is likely due to that process. Aryepiglottic fold thickening and piriform sinus enlargement have also been reported in cases of vocal fold paralysis from tracheal diverticula [9]. Diagnosis of tracheal diverticula includes CT of the neck and chest. Bronchoscopy can be helpful, however, diverticula or their communication point with the trachea may not be visible[7]. Barium esophagogram can eliminate hypopharyngeal diverticula or pharyngoceles as differential diagnoses for individuals presenting with swallow symptoms [3,7]. Treatment depends on patient symptom severity and risk factors. For symptomatic patients, transcervical or thoracic surgical resection, or endoscopic laser cautery may be preferred [3,8]. Surgical resection has allowed full recovery of vocal function for those individuals with vocal fold immobility. For asymptomatic diverticula, or for patients with co-morbidities, observation, antibiotics, mucolytics, and physiotherapy can treat associated symptoms [3,8]. This patient was referred to Thoracic Surgery for evaluation, but he declined follow-up.

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