

Unilateral vocal cord palsy secondary to mediastinal lesion compressing the recurrent laryngeal nerve

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How to citation this article: Dr. Ricky Somai, Dr. Bhumika Priyadarshni, “Unilateral vocal cord palsy secondary to mediastinal lesion compressing the recurrent laryngeal nerve”, IJMACR– October– 2026, Volume – 9, Issue – 5, P. No. 243 – 247.

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Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Hoarseness due to left vocal cord paralysis can result from compression of the recurrent laryngeal nerve (RLN) by mediastinal pathology. This case series presents two patients with hoarseness caused by such compressive lesions. The first case involved a 45-year-old female with tuberculous mediastinal lymphadenopathy compressing the left RLN, without classic systemic symptoms. Contrast-enhanced CT revealed necrotic lymph nodes in the aortopulmonary window. The second case described a 57-year-old male with an anterior mediastinal mass encasing vital vessels and adjacent lymphadenopathy, causing left vocal cord paralysis confirmed by the “sail sign” on imaging. The left RLN’s longer intrathoracic course predisposes it to injury from masses or lymphadenopathy. Imaging is critical in evaluating unexplained hoarseness, especially

in tuberculosis-endemic regions where infectious causes must be considered alongside neoplasms. These cases emphasize the importance of cross-sectional imaging and a multidisciplinary approach for accurate diagnosis and management of RLN palsy secondary to mediastinal compression.

Keywords: Hoarseness, Recurrent Laryngeal Nerve, Mediastinal Lymphadenopathy, Vocal Cord Paralysis, Tuberculosis

Introduction

Hoarseness, an alteration in voice quality, arises from various laryngeal and neural pathologies. Causes range from benign lesions like vocal fold nodules to serious conditions such as unilateral vocal cord paralysis due to recurrent laryngeal nerve compression. The left nerve is especially vulnerable because of its longer intrathoracic course, making it prone to compression by mediastinal

masses or lymphadenopathy¹. This case series presents patients with hoarseness caused by such compressive lesions affecting the left recurrent laryngeal nerve.

Case Presentations

In case 1, a 45-year-old female, with no prior history of tuberculosis, presented to the otolaryngology clinic with a primary complaint of hoarseness persisting for two months. She denied any constitutional symptoms such as cough, fever, weight loss, or night sweats, commonly associated with active tuberculosis.

In the clinical finding, flexible laryngoscopic examination revealed left vocal cord paralysis. Chest auscultation was unremarkable. Given the atypical presentation, advanced imaging was undertaken.

In the radiological findings the contrast-enhanced computed tomography (CT) of the chest demonstrated an enlarged lymph node in the pretracheal region, along with a centrally necrotic, peripherally enhancing lymph node in the aortopulmonary (subaortic) window, measuring approximately 26 × 17 mm. The location of the lymphadenopathy suggested compression of the left recurrent laryngeal nerve.

In, case 2, where a 57-year-old male presented with complaints of progressive hoarseness, accompanied by chest heaviness and exertional breathlessness. The voice change was gradual in onset and persistent.

On investigation, a contrast-enhanced CT scan of the neck and thorax revealed a large, well-defined heterogeneous anterior mediastinal mass lesion measuring 91 × 80 × 50 mm with internal calcifications. The mass was noted to partially encase the aortic arch, left pulmonary artery, and pulmonary vein. Additionally, multiple enlarged lymph nodes were seen in the subaortic region, adjacent to the course of the left recurrent laryngeal nerve. Axial CT imaging at the level

of the glottis showed dilation of the left laryngeal ventricle and mild anteromedial displacement of the left arytenoid cartilage, producing a radiological appearance known as the “sail sign,” indicative of vocal cord paralysis.

Discussion

The recurrent laryngeal nerve (RLN), a branch of the vagus nerve (cranial nerve X), innervates all intrinsic laryngeal muscles except the cricothyroid, which is supplied by the external branch of the superior laryngeal nerve. The left RLN follows a longer intrathoracic course around the aortic arch and ascends in the tracheoesophageal groove, making it more prone to compression by mediastinal masses, lymphadenopathy, aneurysms, or malignancies. Its close relation to the inferior thyroid artery also increases risk during thyroid surgery. Dysfunction of the RLN can cause unilateral vocal cord paralysis, presenting as hoarseness, breathiness, or vocal fatigue.

Hoarseness is a common otolaryngology symptom with diverse causes, including inflammatory, infectious, neoplastic, and neurogenic conditions. Unilateral vocal cord paralysis, often from RLN involvement, is a significant organic cause. Ted Mau et al¹ emphasized that, hoarseness is a common symptom that can result from a wide spectrum of underlying causes ranging from the common cold to a malignancy persistent hoarseness requires laryngeal examination and imaging, especially if paralysis is suspected. In both cases, hoarseness was the main symptom, with flexible laryngoscopy confirming left vocal cord paralysis. Neither patient had systemic signs like fever or weight loss, prompting further imaging.

In Case 1, CT imaging revealed necrotic lymphadenopathy in the pretracheal and subaortic

regions compressing the left RLN. Dankbaar JW et al², emphasized that, any lesion along the course of vagus nerve before branching of Recurrent Laryngeal Nerve (RLN) or involving RLN itself may result in VCP, lymphadenopathy at the aortopulmonary window can affect the RLN due to its anatomical proximity. Despite no clinical signs of tuberculosis, the radiologic appearance—peripheral enhancement with central necrosis—suggested tuberculous lymphadenitis. As highlighted by McAdams HP et al³, the suggested that the chest film is the mainstay in the radiologic evaluation of suspected or proven pulmonary TB. CT is occasionally useful for clarifying confusing findings but has not been conclusively shown to have a significant impact on patient management. Extrapulmonary tuberculosis may mimic malignancy on imaging, especially in endemic areas. Shahzad T et al⁴ further noted that mediastinal tuberculosis may present without classical pulmonary symptoms and requires high clinical suspicion. Patients may present with symptoms secondary to disease itself or from the complication of disease like endobronchial obstruction. In Case 2, a large anterior mediastinal mass with calcifications and subaortic lymphadenopathy was seen. Zanini G et al⁵, emphasizes the need for thorough sectioning and entire submission for histologic evaluation of all the mass in particular of mature cystic teratomas, in order to avoid missing multiple additional histogenetically distinct neoplasms categorized such masses as thymomas, lymphomas, or germ cell tumours, all capable of compressing adjacent structures, including the RLN. The presence of the “sail sign” on CT—described by Song SW et al⁶ as indicative of vocal cord paralysis, CT is helpful for the early detection of primary malignancy or progression of malignancy between follow-ups—further

supported RLN involvement. While the mass's heterogeneous enhancement suggested a neoplastic aetiology, infectious or inflammatory causes could not be excluded without histopathological confirmation.

These cases underscore the importance of considering mediastinal pathology in patients with unexplained left vocal cord paralysis. Contrast-enhanced CT is crucial for identifying compressive lesions and guiding diagnosis. In tuberculosis-endemic regions, tuberculous lymphadenopathy must remain a key differential, even in the absence of systemic features. A multidisciplinary approach is essential for accurate diagnosis and appropriate management.



Figure 1: Enlarged lymph node in the aortopulmonary groove causing compression of adjacent recurrent laryngeal nerve.

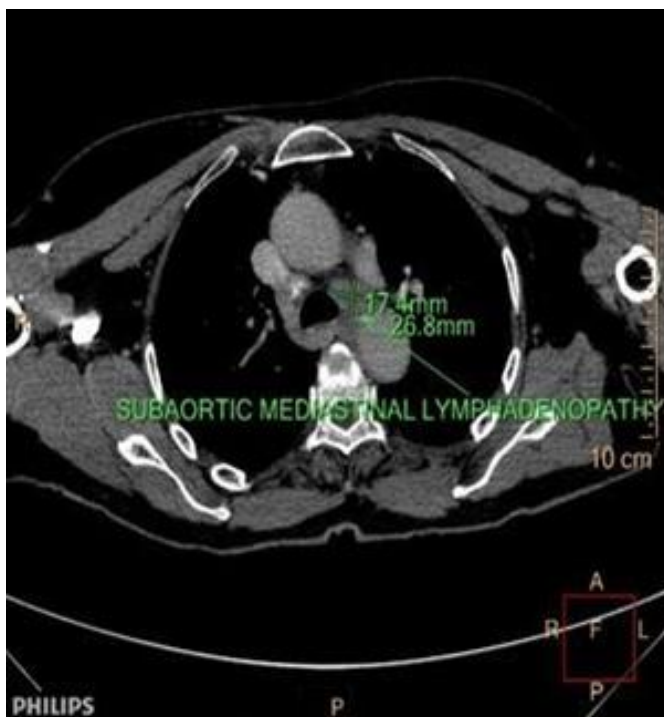


Figure 2: Subaortic mediastinal lymphadenopathy in the vicinity of recurrent laryngeal nerve causing its compression and resultant vocal cord palsy

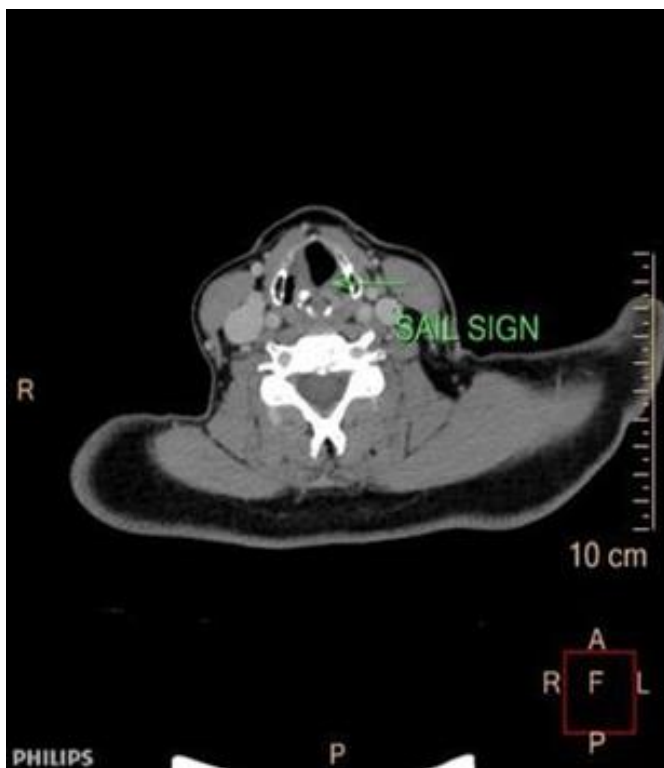


Figure 3: Axial CT at the level of vocal cord shows dilatation of left laryngeal entriple and mild

anteromedial displacement of left arytenoid cartilage resembling sail sign.

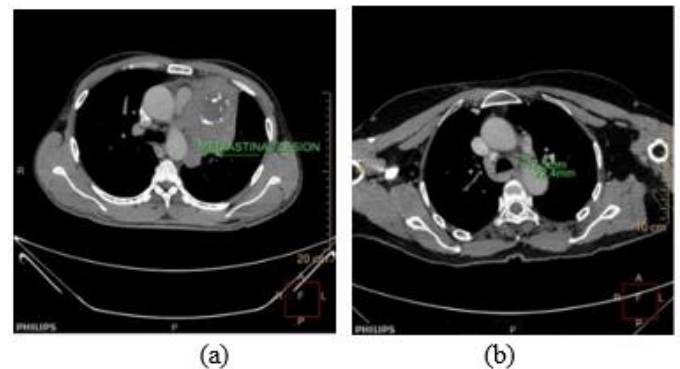


Figure 4: (a) Mediastinal lesion encasing the pulmonary artery and arch of aorta in the vicinity of traversing Recurrent laryngeal nerve in the aorto pulmonary groove.



Figure 5: Mediastinal lymph node in the aortopulmonary window along the course of the left recurrent laryngeal nerve

Conclusion

This case report highlights the vital role of cross-sectional imaging in identifying mediastinal pathology of left vocal cord paralysis in patients presenting with hoarseness. Contrast-enhanced CT neck and Thorax is

essential for detecting mediastinal compressive lesions along the course of recurrent laryngeal nerves and for characterization of lesions. Prompt evaluation and a multidisciplinary approach are crucial for accurate diagnosis and timely intervention.

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