

Unraveling a Diagnostic Dilemma: Coexisting Metastatic and Tuberculous Cervical Lymph Nodes in a Post-Ablative Thyroid Carcinoma Patient – A Case Report on Uncommon Dual Pathology

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ABSTRACT

Tubercular lymphadenitis can mimic cervical lymph node metastasis from papillary thyroid carcinoma (PTC) due to similarities in the distribution and imaging characteristics of the affected lymph nodes. Here we report a rare case of simultaneous metastatic deposits and tuberculosis (TB) within the cervical lymph nodes of a patient with thyroid carcinoma after 5 years of radioiodine ablation.

Keywords: Cervical lymphadenopathy, papillary thyroid carcinoma, metastasis, tuberculosis.

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INTRODUCTION

Thyroid cancer accounts for 1% of all malignancies and 0.2% of cancer-related deaths, with papillary thyroid carcinoma (PTC) being its most common histological subtype (1,2). Tuberculosis (TB) is one of the leading causes of death from infectious diseases. TB represents 10% of all cases in the head and neck region and is frequently associated with lymph node involvement. Cervical lymphadenitis is the most common clinical manifestation of extra-pulmonary TB (2,3). PTC typically spreads through the lymphatic system and often presents as regional lymphadenopathy similar to extra-pulmonary TB in the cervical nodes (3). Simultaneous development of metastatic deposits and TB in cervical lymph nodes in a documented PTC patient make diagnostic dilemma due to indistinguishable imaging features (1). In the TB endemic areas, proper evaluation of cervical lymphadenopathy is essential to reach a definitive diagnosis and appropriate treatment (3).

CASE REPORT

A 44-year-old female was diagnosed as PTC in right lobe of thyroid in 2019, confirmed by imaging studies and FNAC. She underwent total thyroidectomy with lateral neck dissection in the same year, followed by high-dose radioactive iodine (¹³¹I) treatment of 150mCi. Then she was placed on levothyroxine suppression therapy and experienced an uneventful disease-free interval for about 5 years.

During her routine follow-up in INMAS, Mitford at April 2024, she reported left-sided neck swelling. A high-resolution ultrasound scan (HRUS) revealed post-thyroidectomy state and multiple enlarged, hypoechoic lymph nodes with distorted fatty hilum at level IV of left side. Larger lymph node measured about 9x6mm at the area of her complaint. Additionally, single enlarged, lobulated and distorted lymph node measuring about 11x10mm with cystic necrosis and small solid component was noted at the right level IV. The solid portion exhibited increased vascularity and discrete calcifications. Due to documented history of PTC of the patient, cervical lymph node recurrence was the primary diagnosis.

Two ultrasound (US) guided FNACs were performed. The lymph node from the right level IV showed enlarged nuclei with nuclear grooves and intranuclear inclusions, consistent with PTC metastasis. Surprisingly, FNAC of the left level IV lymph node revealed chronic granulomatous inflammation, indicative of tuberculous lymphadenitis.

Subsequently, the patient developed pain and a sinus tract formation at the site of the left-sided neck swelling. HRUS showed the sinus tract extended from the enlarged left level IV lymph node towards the skin surface. US guided aspiration revealed granulation tissue infiltrated with acute and chronic inflammatory cells, consistent with a tubercular abscess. Laboratory tests showed leukocytosis with normal hemoglobin level. Thyroglobulin (TG) was elevated (9.54 ng/mL) with normal anti-TG (1.3 IU/mL) level. Serum TSH was 0.34 μ IU/mL.

The combined cytological findings and biochemical markers confirmed our patient as a rare case of simultaneous PTC recurrence and tuberculosis (TB) in the cervical lymph nodes five years after radioiodine therapy.

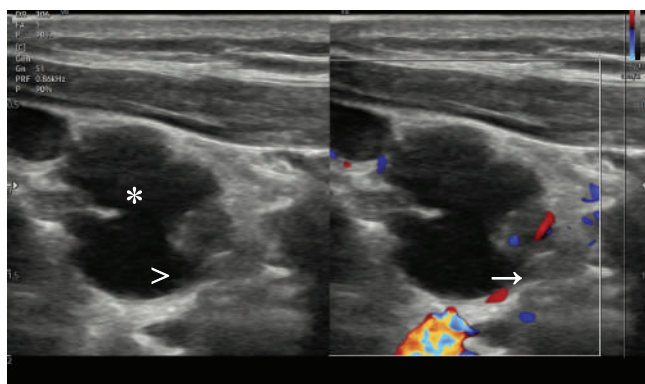


Figure 1: HRUS of right side of neck revealed a lobulated, enlarged, distorted lymph node at level IV with cystic necrosis (*). Increased vascularity (>) and discrete calcification (→) noted in small solid component.

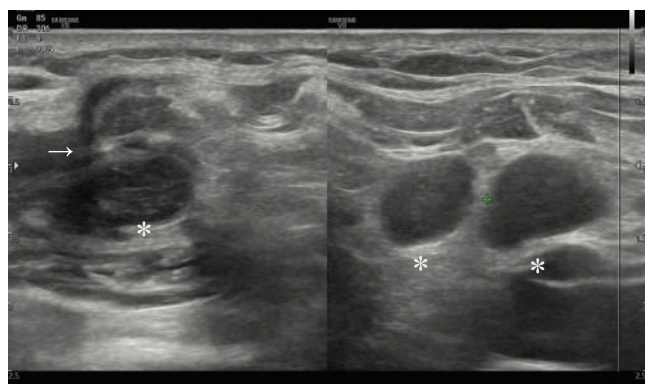


Figure 2: HRUS of left side of neck revealed multiple enlarged, hypoechoic lymph nodes (*) at level IV with distorted fatty hilum. A linear sinus tract noted from a lymph node towards the skin surface (→).

DISCUSSION

Thyroid cancer is the most common malignant tumor in the head and neck region, with PTC accounting for over 80% of all thyroid cancer cases (1,4). Most patients have a favorable prognosis following total thyroidectomy and radioiodine ablation with 10-year survival rate exceeding 90%. Previous studies have reported that local or distant recurrence rate is approximately 30% (5). Postoperative lymph node metastasis is a critical factor influencing the prognosis of thyroid cancer (5,6).

TB has remained a major global and public health challenge. Although preventable and treatable, it is still one of the major contributors to morbidity and mortality in developing countries. Bangladesh is one of the world's 30 high TB burden countries. It is a multisystem infectious disease caused by *Mycobacterium tuberculosis* which mainly affects the lungs. TB can affect multiple organs and can present without any symptoms (1,4). Extra pulmonary TB seen in nearly 15%-20% of all TB cases. Cervical lymph node is the most common extrapulmonary site for harboring TB (7).

Cervical lymphadenopathy presents a diagnostic challenge due to its diverse etiologies. Malignancies, whether primary or metastatic and infections are the primary causes that must be considered in the differential diagnosis of cervical lymphadenopathy (8). Differentiating TB lymphadenitis from metastatic lymph node recurrence can be challenging in patients with a prior history of PTC. Enlarged lymph nodes in the supraclavicular region or posterior triangle of the neck are common sites for both TB lymphadenitis and metastatic lymph nodes from PTC. Diagnosis requires a combination of medical imaging and histopathological evaluation (9).

Ultrasound (US) and computed tomography (CT) are the primary imaging modalities used for diagnosis. US is the first-line imaging tool for evaluating suspected cervical lymphadenopathy due to its wide availability, patient acceptance, non-ionizing nature, non-invasive approach and of low cost. However, the ultrasound features of TB lymphadenitis and metastatic lymph nodes from PTC are

strikingly similar, including cystic necrosis, calcification, hypo echogenicity, rounded shape and the loss of the central fatty hilum. While US is effective for distinguishing benign from malignant cervical lymph nodes, it remains inadequate for reliably differentiating these two entities particularly (1-9,10).

CT is the next imaging option but also struggles to distinguish between these two conditions due to overlapping imaging characteristics, such as peripheral irregular contrast enhancement and central low-density areas. Additionally, CT is less accessible, more expensive than US, and exposes patients to higher levels of radiation (4).

According to the latest guideline, fine needle aspiration cytology (FNAC) is recommended as the best initial test for cytology. A study showed that US guided FNAC had a sensitivity of 88% and a specificity of 66%. Few other studies revealed the sensitivity of the FNAC to be 46% - 90%. However, histopathology remains the most definitive diagnostic tool for cervical lymphadenopathy, enabling accurate diagnosis and guiding effective treatment (4,9).

Numerous studies have described TB lymphadenitis mimicking metastatic lymph nodes from PTC. In many cases, histopathological analysis of dissected cervical lymph nodes reveals TB without any evidence of metastasis. However, reports of the synchronous coexistence of TB and metastatic lymph nodes are rare (2,3). Cause of coexistence of these two pathologies is controversial. Immunosuppressive condition like malignancy can increase the risk of reactivation of TB. On the other hand, people with chronic infectious disease like TB are more likely to develop cancer (1,8).

In our case, neck US was not helpful in differentiating tuberculous lymphadenitis from PTC recurrence in cervical lymph node. Due to documented malignancy and nodal location, our initial consideration for lymphadenopathy was metastatic deposits. Both PTC and TB are commonly associated with cervical lymphadenopathy and imaging alone cannot reliably distinguish between the two conditions. In the high TB

prevalence areas, TB should be always considered during evaluation of enlarged cervical lymph nodes in PTC patients (2,11).

CONCLUSION

This case report highlights the importance of including tuberculosis (TB) as a differential for cervical lymphadenopathy in patients with previous history of papillary thyroid carcinoma (PTC) even after a long period of disease-free interval, particularly in high TB-burden countries like Bangladesh.

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