Hepatic Metastasis as an Unusual Manifestation of Papillary Thyroid Carcinoma: A Rare Case Report

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ABSTRACT

Papillary thyroid carcinoma (PTC) is typically an indolent malignancy with a favorable prognosis, and distant metastases are uncommon, most frequently involving the lungs and bones. Hepatic metastasis from PTC is exceedingly rare and may present diagnostic and therapeutic challenges. We report a case of papillary thyroid carcinoma with hepatic and lymph node metastasis (LNM), highlighting its unusual presentation, diagnostic workup, and management approach in a 68-year-old woman with PTC with LNM further developed hepatic metastasis that was of thyroid origin, which was proven cytologically.

Keywords: hepatic metastasis, papillary thyroid carcinoma

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INTRODUCTION

Approximately 90% of malignant thyroid tumors are well differentiated and are classified as papillary thyroid cancer (80%) or follicular carcinoma (10%) (1). Together, they are referred to as differentiated thyroid cancer (DTC), which is relatively rare worldwide and accounts for <1% of all human cancers (2). Distant metastases occur during follow-up in 4% to 15% of patients (3-5). Even rarer are cases of DTC that metastasize only to the liver, with a reported incidence of <0.5% and <15 cases reported since 1970 (6-11). These metastases are mostly identified during the course of treatment and follow-up, and recurrences can occur more than 30 years after initial treatment (12). The presence of distant metastases has almost always been recognized in advanced disease and is often associated with poor outcomes. Thus, early detection of distant metastases influences the prognosis of the patients (13).

CASE REPORT

A 68-year-old hypertensive and diabetic woman having PTC with lymph node metastasis and chronic kidney disease visited Institute of Nuclear Medicine and Allied Sciences, Dhaka (INMAS, Dhaka) for radioiodine ablation therapy (RAIT) after total thyroidectomy with level VI clearance in 2022. Post-surgery 99m Tc thyroid scan showed small focal radiotracer uptake in midline of neck and high-resolution ultrasound of neck showed gross tissue oedema with dense collection in left thyroid bed. Now, after satisfactory rise of TSH level (TSH->60 m IU/L) with raised Tg level (>35 ng/ml) and normal antithyroglobulin level (ATg) (1.2 IU/ml) 150 mci radio-iodine ablation therapy (RAIT) was given on December 2022 followed by L-thyroxine suppressive therapy. Patient's post therapy scan (PTS) showed focal area of good radiotracer concentration (RTC) in thyroid bed. Her follow up period was uneventful, but after one year she suddenly complaints of anorexia and bloating, ultrasonogram (USG) of whole abdomen suggests multiple hypoechoic lesions in both lobes of liver which cytologically proven metastatic PTC of thyroid origin. Her liver function test (LFT) was within normal limit (S. SGPT-32 U/l, S. creatinine-2.3 mg/dl before 2nd therapy).2nd dose of 200 mci RAIT was given on October 2023, PTS showed no RTC in thyroid bed. Follow up USG of whole abdomen showed multiple ill outlined solid lesions in both lobes of liver, (largest one around 2 cm) but patients feel better than before. USG of neck reported no residual tissue or suspected lymph nodes in neck. Tg and ATg were not raised on daily L-thyroxine suppressive doses. I131 Large dose scan (LDS) was negative with mildly raised Tg (Tg- 9.24 ng/ml, ATg-<1.3 IU/ml). Now, her S. SGPT-22 U/l and S. creatinine-1.9 dl. Currently follow-up is ongoing to observe the outcomes.

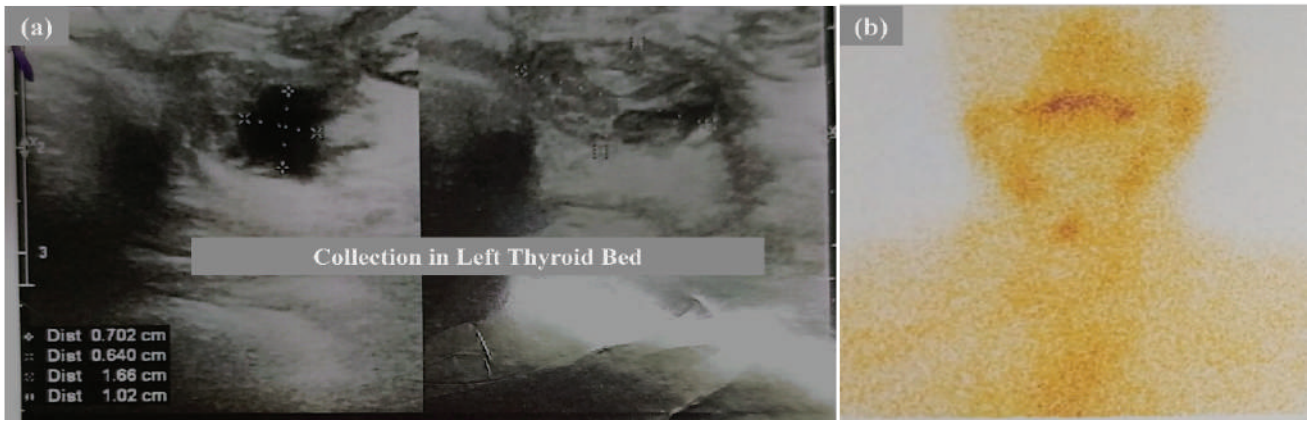

Figure 1: (a) High resolution ultrasound of neck showed gross tissue oedema with dense collection in left thyroid bed (b) Post-surgery 99m Tc thyroid scan showed small focal radiotracer uptake in midline of neck.

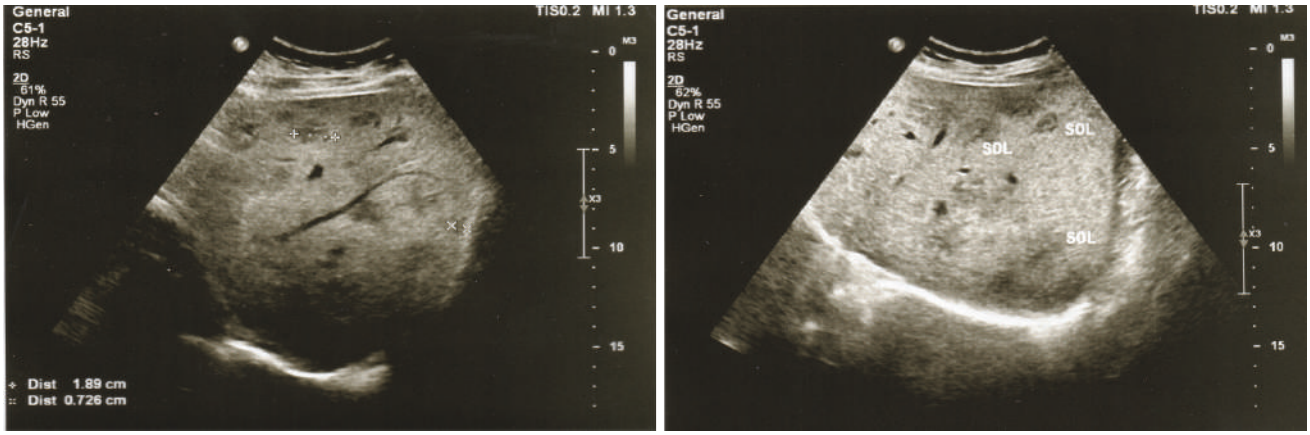

Figure 2: Transabdominal ultrasound image showing multiple hypoechoic lesions of variable sizes throughout the hepatic parenchyma.

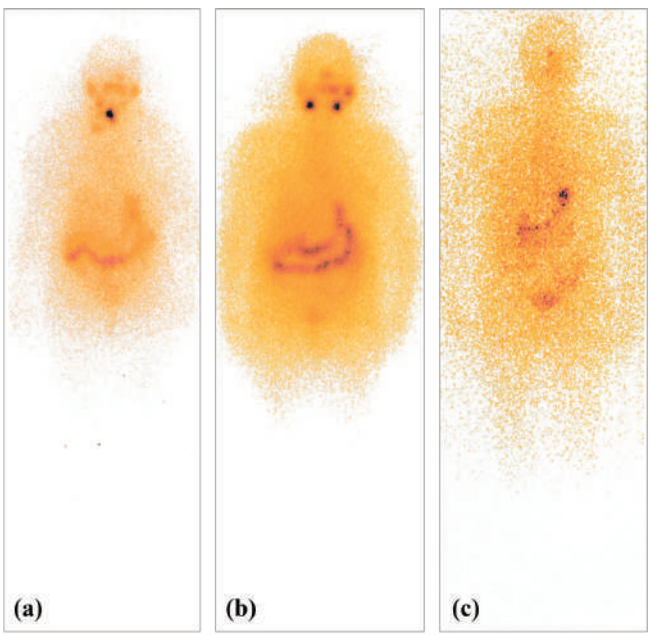

Figure 3: (a) 1st post therapy scan (2022) showed focal area of good radiotracer uptake in thyroid bed. (b) 2nd post therapy scan (2023) showed no radiotracer uptake in thyroid bed (c) Negative I131 Large dose scan (2025)

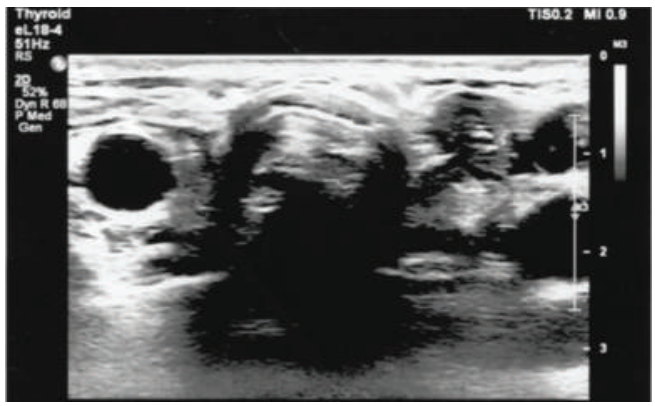

Figure 4: Follow up ultrasound of neck showed no residual tissue or suspected lymph nodes

DISCUSSION

Papillary thyroid carcinoma (PTC) is the most common histological subtype of thyroid cancer, accounting for approximately 75–80% of all cases worldwide (1). It typically arises from the follicular epithelial cells of the thyroid gland and is characterized by an indolent clinical course and excellent overall prognosis. PTC most

commonly affects young to middle-aged adults and shows a higher prevalence in females. The tumor often spreads via lymphatic channels, leading to frequent involvement of regional cervical lymph nodes, while distant metastases are relatively uncommon and usually involve the lungs and bones. Thyroid and liver diseases are closely interconnected, with each organ influencing the function of the other through complex metabolic and hormonal pathways. The liver plays a central role in metabolism, transport, and clearance of thyroid hormones by synthesizing key binding proteins such as thyroxine-binding globulin, transthyretin, and albumin, which regulate hormone availability in circulation. It is also involved in the peripheral conversion of thyroxine (T4) to the more biologically active triiodothyronine (T3) via deiodination processes. Consequently, liver dysfunction can lead to alterations in thyroid hormone levels and their bioavailability. Papillary thyroid carcinoma (PTC) with hepatic metastasis is an extremely rare clinical entity, as PTC typically spreads via lymphatics to regional cervical lymph nodes, with distant metastases most commonly involving the lungs and bones. Liver involvement is uncommon and often indicates advanced or aggressive disease (6). Patients may present with nonspecific symptoms or may be asymptomatic, with hepatic lesions detected incidentally during imaging or follow-up. Diagnosis usually involves imaging modalities such as ultrasound, CT, or PET scans, supported by elevated serum thyroglobulin levels and confirmed by histopathology or biopsy when necessary. Management is not standardized due to its rarity but may include a combination of total thyroidectomy, radioactive iodine therapy, targeted therapy, and, in selected cases, surgical resection or local treatment of liver lesions. Prognosis depends on the extent of disease, iodine avidity, and response to therapy, with careful long-term follow-up being essential. In this case, hepatic metastasis was detected one year after diagnosis of PTC with LNM diagnosed by ultrasonogram. The liver function test was normal, but patients complained of severe anorexia and bloating during follow-up. Now, after the 2nd dose of RAIT, she feels better.

CONCLUSION

Hepatic metastasis from papillary thyroid carcinoma is an exceptionally rare occurrence that may pose diagnostic and management challenges. This case highlights the importance of maintaining a high index of suspicion for atypical metastatic sites in patients with PTC, especially in the setting of biochemical or clinical discordance. Early recognition and a multidisciplinary approach are essential for optimal management. Careful long-term follow-up is crucial to detect disease progression and guide individualized treatment strategies.

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