Unusual Metastases in Papillary Microcarcinoma of Thyroid

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Abstract

Papillary carcinoma thyroid is the most common type of thyroid cancer. Papillary thyroid cancer metastasizes commonly to regional lymph nodes, distant organ involvement is to lungs and bone are rare and is associated with poor prognosis. Metastases to intra-abdominal organs are extremely rare. Here, we report a case of 50-year-old female diagnosed with papillary microcarcinoma thyroid who initially treated total thyroidectomy, later presented with metastasis to liver, bone, left adrenal gland, and bilateral lungs. The functioning metastasis was diagnosed by Iodine-131 whole-body scan and later treated with radioiodine.

Keywords: *Iodine-131 whole body scan, papillary thyroid cancer, unusual metastasis*

Introduction

Papillary thyroid cancer (PTC) is the most common type among thyroid cancers, representing about 70%–90% of all the thyroid cancer cases.[1] It occurs more frequently in women when compared to males with incidence ratio of 2.5:1 and presents in the 20–55 years of age group. It is also the predominant cancer type in children with thyroid cancer and in patients with thyroid cancer who have had previous radiation to the head and neck.[2] It is often well-differentiated, slow-growing, and localized. According to SEER,[3] The incidence of papillary cancer has increased from 4.8 to 14.5/10,000 during 1975–2018.

Commonly PTC metastasizes principally to local lymph nodes. Distant metastases from PTC are rare and associated with poor prognosis.[1] Some types of PTC with aggressive histology can present with distant metastasis. Even when distant metastases occur, bones, and lungs are involved. Intra-abdominal metastases to liver and adrenal involvement are very rare from PTC.

Here, we report a rare case of PTC with liver and adrenal metastases. The patient also had synchronous involvement of neck nodes, bone, and bilateral lung metastases also. These functioning metastases were successfully diagnosed and treated by radioiodine.

Case Report

A 50-year-old female patient, initially presented with complaints of swelling in front of the neck since 8 years, was progressively increasing in size with associated pain since 3 weeks that was dull type not radiating with no aggravating and relieving factors. There was no history of change in voice, difficulty in deglutition or respiration. There was no history of palpitations, edema, intolerance to warm temperature, weight loss, tremors, abdominal pain, vomiting, nausea, jaundice, restlessness, agitation, seizures, and hyperdefecation. There was no history of lethargy, weight gain, dyspnea, breathlessness, hearing loss, intolerance to cold, constipation, hair loss. There was no history of discoloration of the skin, weakness of limbs, fever, bleeding manifestations, and syncope.

On examination, Swelling of size 12 cm × 15 cm was noted in front of neck, firm, nontender, moving with deglutition. Ultrasonography of neck revealed multiple isoechoic nodules with central cystic degeneration and increased vascularity in both lobes – suggesting multinodular goiter. Later, the patient underwent total thyroidectomy. Postoperative histopathological examination findings suggested papillary microcarcinoma thyroid of trabecular variant with tumor node metastasis staging being T1aNxMx (Stage I). Then, the patient was maintained on tablet thyroxine 125 µg/day.

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A year later, the patient presented with back pain, magnetic resonance imaging spine showed metastasis to D5–D7 vertebral bodies with destruction of D6 vertebra causing cord compression. Patient then received palliative radiotherapy to spine with a total dose of 20GY in 5 fractions.

Later, the patient underwent Iodine-131 (I131) whole-body scan, following the withdrawal of thyroxine hormone for 4 weeks, which showed radioiodine avid uptake noted in thyroid bed - suggestive of residue. Also seen multiple foci of abnormal tracer activity in right humeral head, D5–D7 vertebral bodies, left adrenal gland, liver and bilateral lungs- suggestive of functioning metastases [Figure 1].

The patient was planned for radioiodine ablation therapy after being stratified as high risk according to the American Thyroid Association. The patient was administered 200 mCi of radioactive iodine orally. Posthigh dose I131 whole body scintigraphy finding showed good radioiodine uptake in residual thyroid tissue in thyroid bed and other sites mentioned in the body as in pretherapy scan [Figure 2].

Discussion

Nearly 15% of the thyroid cancers undergo metastasis. However, the probability of hematogenous spread is less with PTC, as it commonly spreads through lymphatic's unlike follicular carcinoma thyroid, which has a propensity for vascular invasion and hematogenous metastases.

Of the various histological types of PTC, Hobnail, columnar, Tall cell, and solid/trabecular variant are more aggressive. In our case, the patient had an aggressive histological type of trabecular variant that might be the cause of such a wide spreads metastases.

A papillary thyroid carcinoma is designated as trabecular variant when all or nearly all of a tumor not belonging to any of the other variants has a solid or trabecular appearance. This tumor must be distinguished from poorly differentiated thyroid carcinoma which has the same growth pattern but lacks nuclear features of papillary thyroid carcinoma.[4]

This form of PTC is commonly seen in young patients and patients exposed to radiation. It has been identified in 37%

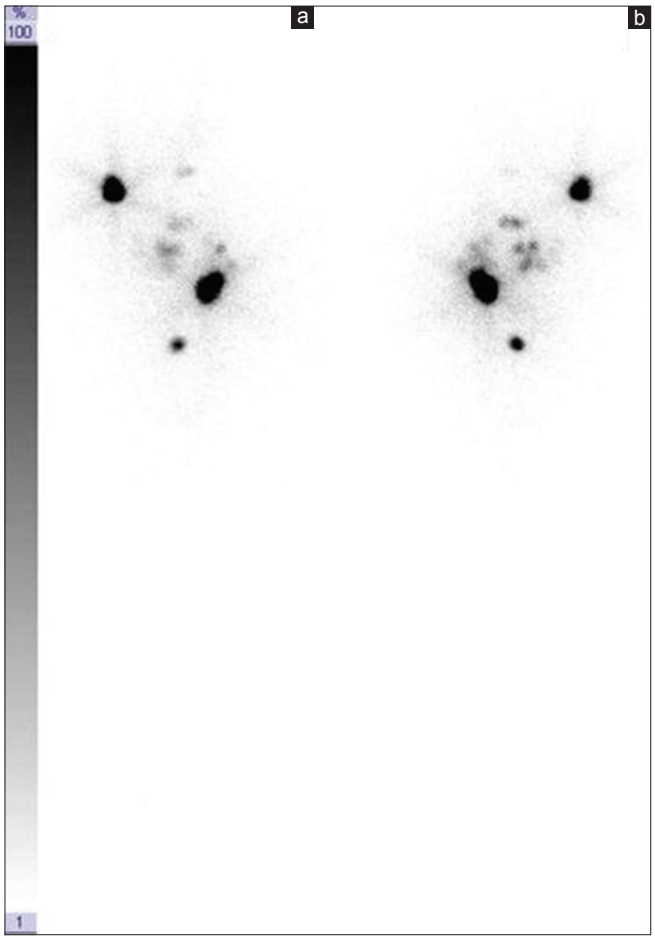

Figure 1: Iodine-131 Williams–Beuren syndrome both anterior (a) and posterior (b) sweep views showing iodine avid residual thyroid tissue in thyroid bed with multiple functioning thyroid metastases in the right humeral head, bilateral lungs, liver, and left adrenal gland

Figure 2: Iodine-131 posthigh dose therapy scan both anterior (a) and posterior (b) sweep views shows good localization of radioiodine in residual thyroid tissue in thyroid bed with multiple functioning thyroid metastases in the right humeral head, bilateral lungs, liver, and left adrenal gland (thick arrow)

of the radiation-induced thyroid tumors among survivors of the Chernobyl accident.[5] RET/PTC3 rearrangement is associated with pediatric and radiation-associated solid variant of papillary thyroid carcinoma. Extracapsular extension and invasion of lymph nodes were documented in 83% of the patients, indicating it to be a more aggressive variant. The solid variant of papillary thyroid carcinoma has a higher frequency of distant metastases (lung) and less favorable prognosis than classical papillary thyroid carcinoma. The mortality rate for this tumor in adults is up to 10%. However, the outcome and prognosis for trabecular variant was found to be limited and was similar to that of classical papillary carcinoma thyroid.[6]

Of all the cases of PTC, only 3.5%–3.8% cases show distant metastasis.[7] With most common of them being lungs and bone. Intra-abdominal metastases from PTC are extremely rare.[8,9] Adrenal metastasis from thyroid cancer is relatively rare compared to metastasis from other cancers.[10] The variable expression of sodium iodide symporter (NIS) among different metastatic sites or selective loss of NIS function in various metastatic sites may be the reasons for which unusual metastatic lesions from thyroid primaries are rarely detected in life.[11] I131 whole body scan does help in early detection of metastasis, but the survival rate decreases considerably. Distant metastasis is often associated with poor prognosis with 10 years' survival rate being <50%.[12]

This article highlights the aggressiveness of papillary microcarcinoma thyroid, may be because of aggressive trabecular histology, had an unusual widespread metastatic disease.

Conclusion

Papillary carcinoma of thyroid commonly spreads through lymphatics. However, few aggressive histological types such as trabecular variant show a predilection to distant spread that can cause unusual metastasis in the patients. The presence of distant metastasis indicates bad prognosis with decreased survival rates.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published, and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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