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Papillary carcinoma thyroid with rare metastases: A case report and review

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ABSTRACT

A 55-year-old female presented with a 10 years history of swelling in the front part of her neck, and a persistent headache for the past 4 months. During the course of her hospital stay, she developed right upper limb monoplegia. An examination showed that she had papillary carcinoma thyroid in an euthyroid state. Further work-up revealed a solitary pulmonary nodule on the left lower lobe, right ventricular tumor thrombus in the heart, and hemorrhagic metastases involving the left cerebral and cerebellar hemispheres. Total thyroidectomy with bilateral functional and central neck dissection was performed. Postoperatively, the patient received radioiodine ablation with I131 for lung and brain metastases, and remnant ablation for primary treatment. She has received regular follow-up care for the past 3 months.

Key words: *Papillary carcinoma thyroid, radioiodine ablation, solitary pulmonary nodule, ventricular tumor thrombus*

Introduction

Papillary carcinoma thyroid is the most common differentiated thyroid cancer with a good prognosis and long-term survival. Lung and bone are the common sites of distant metastasis. Here, we present a patient with papillary carcinoma thyroid who presented to us with multiple rare distant metastases.

Case Report

A 55-year-old female presented to our outpatient department with a 10-year history of swelling in the front part of her neck, which had rapidly progressed in size over the past 3 years. There were no features suggestive of hypo or hyperthyroidism, and no associated comorbidities. She had also been bothered by headaches for the past 4 months with no other features of focal neurological deficit. She had no positive family history or past history of exposure to radiation.

Upon examination, a 10 cm × 10 cm swelling was found in the front part of her neck, suggestive of thyroid swelling involving the left lobe and isthmus with no retrosternal extension. Cervical lymph nodes were palpable on the left side of the neck. After hospital admission, she began developing right upper limb weakness. Neurological examination showed right upper limb monoplegia with a muscle power of 0/5. There was no papilledema or bowel/bladder dysfunction. Fine needle aspiration cytology of the neck swelling showed features of papillary carcinoma thyroid. Thy-

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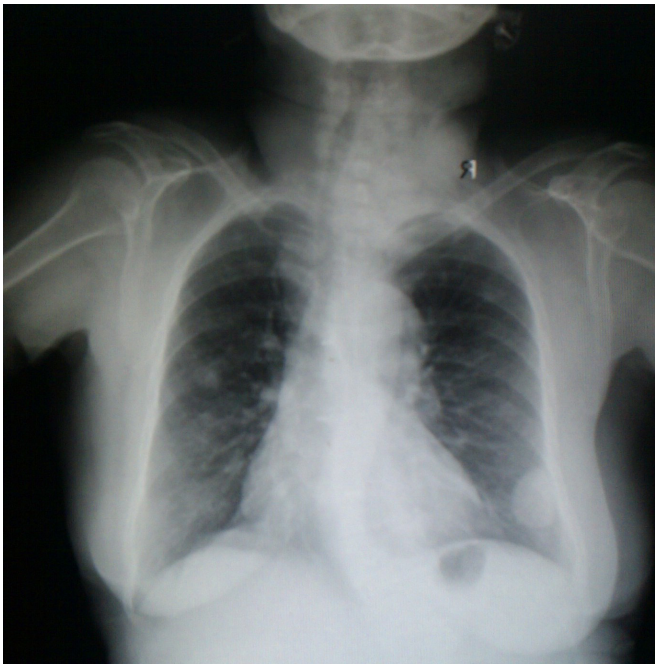

Figure 1. Chest X-ray showing right shift of treachea and solitary pulmory nodule on left.

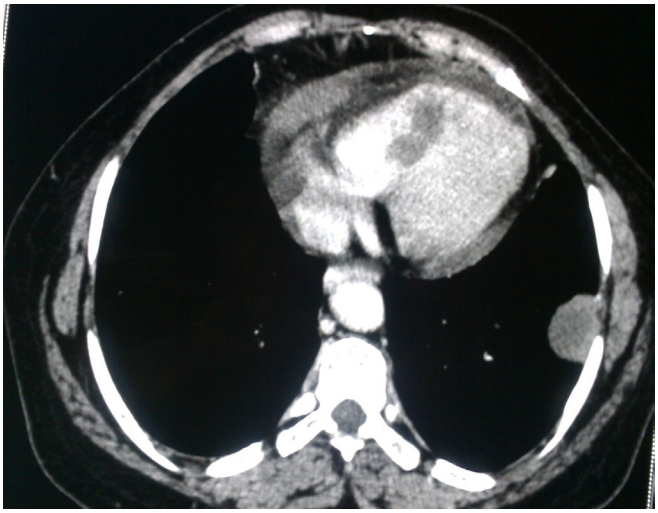

Figure 2. Contrast enhanced computerized tomography thorax revealling non-enhancing hypondense lesion in the right ventricle and solitary pulmonary nodule in the left lung.

roid-stimulating hormone levels were slightly high, although bound and free T3 and T4 levels were within normal limits. Serum thyroglobulin was found to be 130 ng/dl. Indirect laryngoscopy was normal. A chest X-ray revealed a solitary nodule in the left lower lobe with tracheal deviation towards the right (Figure 1). A routine transthoracic echocardiography was performed to assess several aorta segments, and showed a 4.5 cm × 2.8 cm echogenic mass attached to the free wall of the right ventricle, suggestive of tumor thrombus with sclerotic aortic valve and an ejection fraction of 63%.

Contrast enhanced computerized tomography (CT) of the thorax revealed multiple enhancing nodules of varying sizes in the bilateral lungs, features suggestive of metastasis. An ill-defined non-enhancing hypodense area in the right ventricle of the heart was noted, suggestive of tumor thrombus (Figure 2). Magnetic resonance imaging (MRI) of the brain revealed multiple T1 isointense lesions, and T2/fluid attenuation inversion recovery hyperintense lesions in the

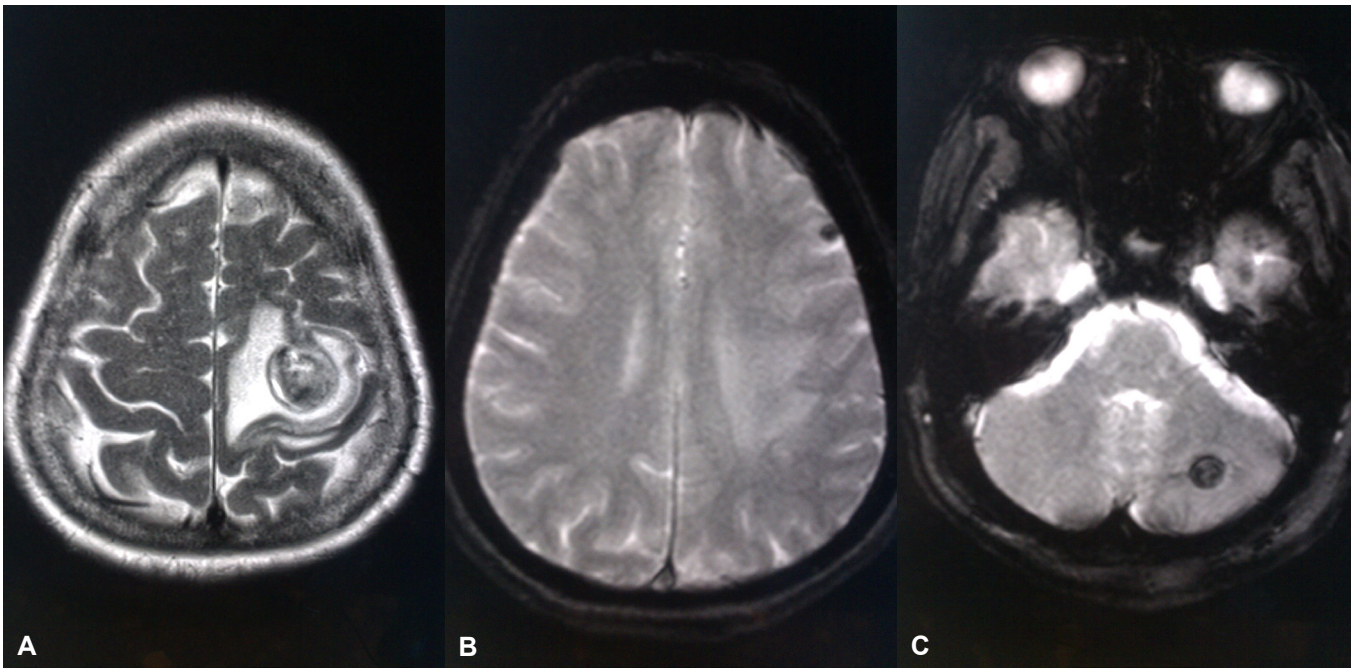

Figure 3. (A) Heterogenous intense lesion with surrounding edema in left parietal lobe. **(B)** Heterogenous intense lesion in the left frontal lobe. **(C)** Heterogenous intense lesion in the left cerebellar hemisphere.

left parietal lobe, frontal lobe, and left cerebellar hemisphere with no midline shift features suggestive of hemorrhagic metastasis in the brain (Figure 3A-C). Total thyroidectomy with central neck dissection and bilateral functional neck dissection was performed. Histopathological examination of the specimen revealed poorly differentiated papillary carcinoma thyroid with extrathyroidal extension and lymphovascular invasion. Postoperatively, the patient received radioiodine ablation with I131 for lung and brain metastases and remnant ablation for primary treatment with suppressive doses of levothyroxine. The patient has received regular follow-up care for the past 3 months.

Discussion

Papillary thyroid carcinoma (PTC) is the most common endocrine malignancy, with an indolent clinical course and good prognosis. It usually metastasizes locally to regional lymph nodes [1]. Distant metastases are rare, and suggest an aggressive disease [2]. The lung is the most common site of distant metastasis, followed by the bone [3]. Other sites are relatively rare and include the brain, breast, liver, kidney, muscle, adrenal gland, choroid, ovary, and skin. Brain metastasis is extremely rare, occurring in 0.5-1.3% of all thyroid carcinoma [4,5]. It occurs more frequently in the cerebral hemispheres, but some unusual locations have also reported, including the cerebellopontine angle, cerebellum, pituitary, and cavernous sinus [3]. The presence of brain metastasis suggests an aggressive disease and unfavorable prognosis with a reported survival of less than a year after diagnosis.

Most patients with brain metastases are asymptomatic; only a few present with features of focal neurological deficits and raised intracranial pressure, such as headaches and vomiting. Therefore, brain metastasis should be suspected in patients with differentiated thyroid carcinoma and neurological symptoms. CT or MRI of the brain is the investigating modalities of choice. Thyroid carcinomas are known to cause hemorrhagic metastasis in the brain. Available treatment options include conservative treatment, surgical excision, external beam radiation, resection and radioactive iodine, intraoperative implantation of radioactive iodine seeds, thyroxine and radiotherapy, gamma knife radio surgery, and radioactive iodine therapy [6]. Successful removal of the brain metastatic lesion significantly improves neurological dysfunction and lowers the rate of cancer mortality. Supportive treatment with radioiodine causes tumor regression, resulting in improvement of the disease-free interval.

Autopsy studies of patients with thyroid cancer have documented a 0-2% incidence of cardiac metastasis [7-9]. The most common histological types are anaplastic thyroid carcinoma, closely followed by follicular carcinoma, including hurthle cell carcinoma, PTC, and adenocarcinoma [10]. Myocardial metastases, which are rarely diagnosed antemortem, often represent the terminal stage of malignant disease and are associated with generally widespread metastasis. The route of involvement is by hematogenous dissemination, lymphatic dissemination, or by local extension that may be intravascular or extravascular in nature. The typical sites for cardiac metastases are the pericardium, epicardium, and the right side of the heart, with the endocardium, myocardium, and left side of the heart much less commonly affected [11,12]. Clinical diagnosis of metastases is difficult, as there are no early symptoms. Dyspnea, symptoms of pericarditis, arrhythmias, or sudden death may be the presentation.

Trnsthoracic echocardiography is the diagnostic modality of choice, as it allows the dynamic evaluation of intracardiac masses [13]. Contrast echocardiography perfusion imaging can be used to evaluate the vascularity of a mass, subsequently providing additional information to differentiate malignant lesions from benign tumors and thrombi [14]. Generally, the mode of treatment for cardiac tumors varies according to type, location, extent of tumor, and symptoms. Resection is necessary when there is hemodynamic compromise, large tumor burden, or significant symptoms [15,16]. The prognosis of cardiac metastases from thyroid cancer is very likely to be poor and the median survival is approximately 3 months [10].

Conclusion

Although differentiated thyroid carcinoma has a good prognosis with an indolent clinical course, elderly patients with long-standing thyroid carcinoma should always be examined for rare, distant metastasis. Radioiodine therapy can be used as a palliative measure in such cases.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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