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Metastatic papillary thyroid carcinoma presenting as an isolated renal mass: Case report and review of the literature

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A B S T R A C T

Distant metastasis of Papillary Thyroid Cancer (PTC) to the kidney(s), while rare, has been observed, with approximately 30 cases described in the literature. We present the case of a 28-year-old male who was diagnosed with metastatic PTC following resection of a solitary renal mass. Pathological analysis of the thyroid gland following subsequent thyroidectomy revealed positive regional lymph nodes consistent with metastatic PTC, however, no evidence of malignancy was identified in the thyroid gland. To our knowledge, this is the only known case of metastatic PTC involving the kidney in which no primary lesion was found in the thyroid gland.

1. Introduction

Papillary thyroid cancer (PTC), classified alongside follicular thyroid cancer (FTC) as differentiated thyroid carcinoma (DTC), constitutes the majority of all thyroid malignancies. Contemporary studies have noted the presence of distant metastasis at or prior to the diagnosis of metastatic PTC in 3–4% of patients.[1,2] Common sites for metastatic DTC include the lungs (70%) and bone (20%), but other rare sites of distant metastasis have been reported.[3] Renal metastasis from metastatic PTC, although extremely rare, have occurred, with 30 reported cases to date.[4] Here we present a patient with metastatic PTC presenting as a solitary renal mass in which no primary lesion was found in the thyroid gland following subsequent thyroidectomy. After review of the literature, we believe this to be the only case with metastatic PTC to the kidney without a proven primary lesion in the thyroid gland.

2. Case presentation

A 28-year-old African American male presented to our emergency department (ED) with complaints of worsening right-sided abdominal pain. The patient had no significant medical history, and specifically no history of thyroid disease nor radiation to the head and neck. An IV contrast enhanced CT of the abdomen/pelvis was significant for a 7.0 x 5.3 × 6.0 cm complex cystic mass arising from the posterolateral upper pole of the right kidney suspicious for Renal Cell Carcinoma (RCC) (Fig. 1). The renal mass had a renal nephrometry score of 11XH. The patient denied right flank pain or gross hematuria.

The patient was referred to urology. Pre-operative chest x-ray was obtained, which did not reveal any evidence of metastatic disease. After further discussion we elected to proceed with radical nephrectomy. We did not feel the mass was amenable to a partial nephrectomy.

The patient underwent successful robot-assisted laparoscopic right radical nephrectomy. Intraoperatively, multiple enlarged, abnormal appearing lymph nodes were noted in the right renal hilum as well as in the para-caval nodal bed. We elected to perform a right-sided robot-assisted laparoscopic retroperitoneal lymph node dissection. All abnormal appearing lymph nodes were removed. Frozen sections obtained intraoperatively from a representative lymph node revealed malignant infiltration, however, a tumor subtype could not be determined. Intra-operative ultrasound of the tumor revealed an aggressive appearing tumor with both solid and cystic components (Fig. 2). Multiple microcalcifications were noted within the tumor. The remainder of the case was uncomplicated.

Pathologic review of the specimen revealed a 5.5 cm tumor in the renal upper pole consistent with metastatic PTC. Margins were negative. 3/4 lymph nodes were positive for metastatic PTC. Immunohistochemistry of the specimen tested positive for PAX8 and moderate TTF1 (Fig. 3), a combination only seen in PTC. Pseudoinclusions were also identified on H&E stain. Pathology was sent for a second opinion which confirmed metastatic PTC.

Patient was referred to medical oncology and endocrine surgery. The patient denied any neck pain, difficulty swallowing, or lymphadenopathy of the head and neck. There was no family history of thyroid cancer. Physical examination revealed a symmetric, normal sized thyroid gland without palpable nodules or evidence of cervical lymphadenopathy. A thyroid stimulating hormone (TSH) prior to surgery was within normal

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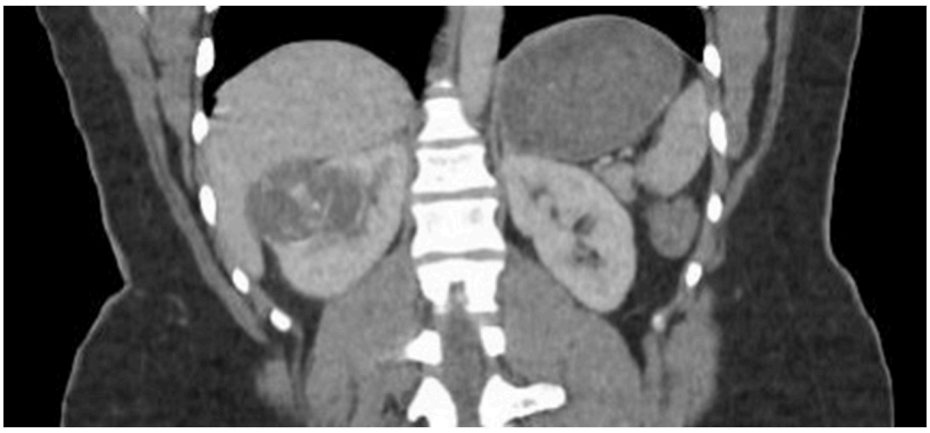

Fig. 1. CT Abdomen/Pelvis with IV Contrast: Coronal view demonstrating a 7.0 x 5.3 × 6.0 cm complex cystic mass arising from the posterolateral upper pole of the right kidney.

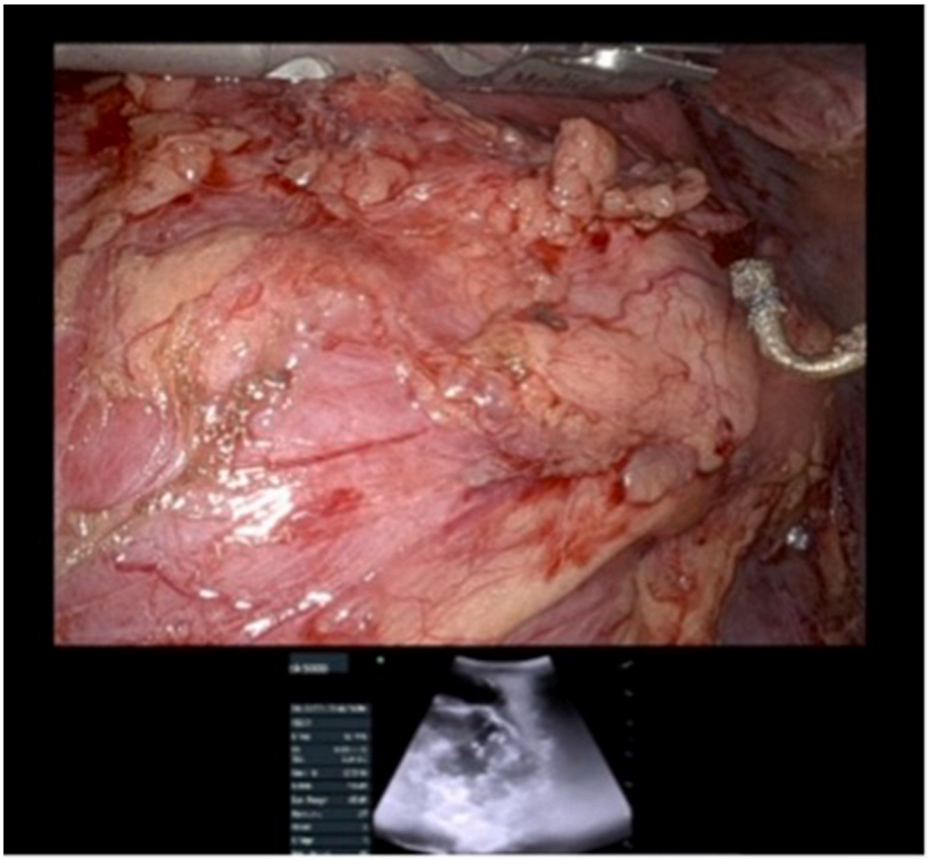

Fig. 2. Intraoperative images of the patient's right renal mass with ultrasound demonstrating both solid and cystic components in addition to multiple microcalcifications within the tumor.

range at 2.09 mcunit/ml. Neck ultrasound did not reveal any suspicious masses or thyroid nodules. A CT of the neck/chest revealed left supraclavicular lymphadenopathy, but no mediastinal, cardiac, or pulmonary abnormalities. The patient underwent total thyroidectomy with left neck dissection of levels 2–4. Pathologic evaluation of the specimen revealed 6/9 positive lymph nodes from level 4 consistent with metastatic PTC, however no primary malignancy was found in the thyroid gland. No extracapsular extension was noted. Postoperative serum Tg was 0.1 ng/mL and Anti-Tg was <0.9 IU/mL. Post-operative TSH was found to be 0.082 mcunit/mL.

3. Discussion

According to the National Cancer Institute (NCI), thyroid cancer constitutes 2.3% of all new cancer diagnoses, with PTC being the most common pathological subtype. Most patients diagnosed with DTC present with localized disease confined to the neck, however the incidence of metastatic DTC is variable, ranging from 6 to 20% in several studies.[2,3] Contemporary studies have noted the presence of distant metastasis at or prior to the diagnosis of metastatic DTC in 3–4% of patients.[1,2] Prognosis for patients without evidence for distant metastasis is excellent, with Shaha et al. reporting an overall survival rate of

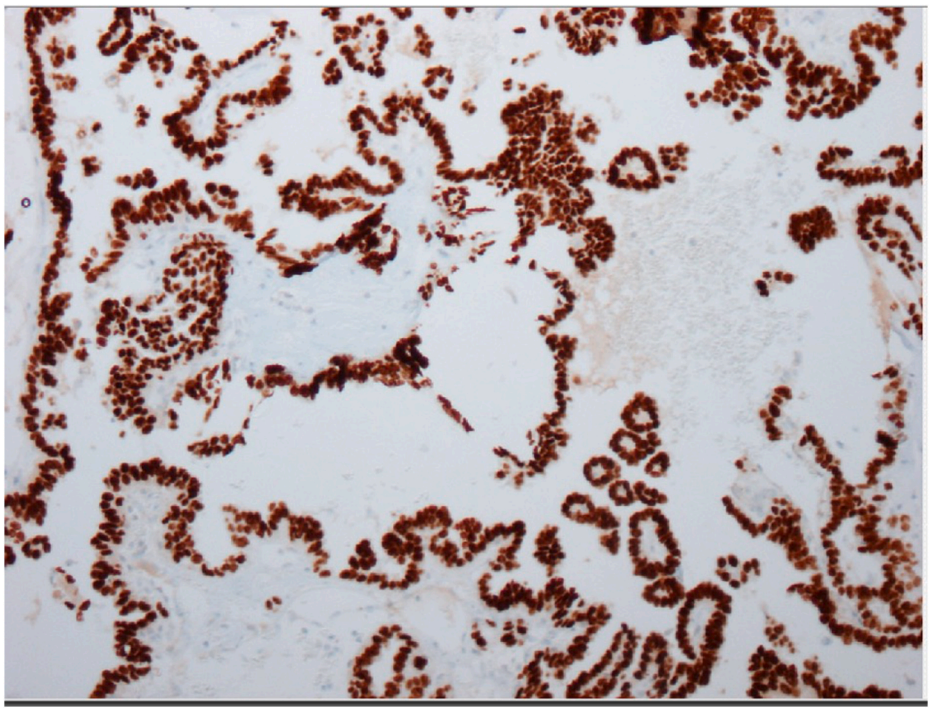

Fig. 3. Immunohistochemistry of the specimen revealing positive staining for TTF1.

86% in those without distant metastasis compared to 43% for patients found to have distant metastasis.[1] Metastasis to loco-regional lymph nodes is relatively common in patients with DTC. Other common sites for metastatic DTC include the lungs (70%) and bone (20%) while other rare sites have been reported.[3] Renal metastasis from metastatic PTC, although extremely rare, have occurred, with approximately 30 reported cases to date.[4] Few case reports to date have described a diagnosis of metastatic PTC following resection of a solitary renal lesion. In these cases, a misdiagnosis of RCC can easily be presumed given the patient's initial presenting symptoms.

To our knowledge, this is the first case to be reported of a patient with metastatic PTC involving the kidney in which no primary lesion was identified in the thyroid gland following subsequent thyroidectomy. Although rare, there have been cases in which patients with PTC following thyroidectomy did not reveal evidence of malignancy in the thyroid gland. Yamashita et al. identified 17 patients diagnosed with occult thyroid carcinoma who underwent thyroidectomy as first line treatment. Pathological examination did not reveal any cancerous lesions in 5/17 patients.[5]

In our patient, a preoperative clinical diagnosis of RCC was made based upon the patient's history, physical examination, and imaging. The patient had no risk factors, physical examination findings, nor imaging findings that would have led us to suspect his renal mass was anything other than a primary renal malignancy. This is one of the few instances in which a diagnosis of metastatic PTC was made following resection of a solitary renal mass. Our patient continues to do well and is scheduled to undergo radioiodine ablation. We hope this case will be helpful in the management and treatment of metastatic PTC in the future.

Declaration of competing interest

The authors have no disclosures.

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