Case Report

Palliative thyroidectomy in the setting of a metastatic renal cell carcinoma

Arvind Krishnamurthy, Suhail Deen, Vijayalakshmi Ramshankar[1], Urmila Majhi[2]

Departments of Surgical Oncology, [1]Preventive Oncology and [2]Pathology, Cancer Institute (WIA), Adyar, Chennai, Tamil Nadu, India

ABSTRACT

A secondary neoplasm of the thyroid gland is a distinctly uncommon cause of thyroid enlargement. These tumors mimic primary thyroid gland tumors and often lead to diagnostic difficulties. We report an interesting case of secondary thyroid tumor coexisting with a micropapillary carcinoma in an elderly male patient following a radical nephrectomy done 15 years prior for a renal cell carcinoma (RCC). Interestingly, the previously described coincidental association of thyroid and pancreatic metastases in a metastatic RCC was also noted in our patient as was demonstrated in the positron emission tomography-computed tomography which was done as part of the metastatic workup. This association needs to be further explored as also the role of palliative thyroidectomy in the setting of a metastatic RCC. The possibility of metastatic RCC should be kept as a differential during the course of the evaluation of clear cell renal tumor of the thyroid gland.

Keywords: Metastatic renal cell carcinoma, palliative thyroidectomy, secondary thyroid neoplasms, metastatectomy

INTRODUCTION

A secondary neoplasm of the thyroid gland is a distinctly uncommon cause of thyroid enlargement, the reported prevalence of which range from 2% to 3% of all thyroid malignancies,[1] autopsy series, however, report a prevalence varying from 1.25% to 24%[2] These tumors mimic primary thyroid gland tumors and often lead to diagnostic difficulties. Herein, we report an interesting case of secondary thyroid cancer coexisting with a micropapillary carcinoma in a 67-year-old male patient following a left radical nephrectomy done 15 years prior for a Fuhrman grade III pT3N0M0 renal cell carcinoma (RCC). We additionally discuss the issues and challenges in its diagnosis and the role of palliative thyroidectomy in metastatic RCC with a thyroid gland secondary.

CASE REPORT

A 67-year-old man with no comorbid conditions presented to us with the complaints of swelling in the anterior neck of 3 months duration. A rapid increase in size of the swelling and with associated pain and difficulty in breathing for a couple of weeks prompted him to seek medical attention. He had undergone a left radical nephrectomy done 15 years prior at our center for a Fuhrman grade III pT3N0M0 RCC following which he defaulted.

Physical examination revealed a well-circumscribed firm to hard swelling arising from the right lobe of the thyroid gland measuring 8 cm × 8 cm, which was pushing the trachea to the left of the midline. Rest of the clinical examination was normal.

Fine needle aspiration cytology (FNAC) from the thyroid swelling suggested a poorly differentiated carcinoma with a possibility of metastasis from a renal primary. A subsequent tru-cut biopsy with immunohistochemistry (IHC) correlation (immunopositivity to vimentin, epithelial membrane antigen, ki-67 and CD10 positive and negative for thyroglobulin, thyroid transcription factor-1, and calcitonin) revealed a tumor with clear cell histology confirming a diagnosis of metastasis from a RCC [Figure 1a-d].

A positron emission tomography (PET)-computed tomography done for metastatic workup revealed an ill-defined heterogeneous mass with a large necrotic component and increased metabolic activity in the right lobe of thyroid standardized uptake value (SUV - 7.2), which was causing mass effect over right neck great vessels and trachea [Figure 1a and b]. In addition, PET avidity was noted nodule in left lower lobe lung, (SUV - 1.7), multiple mediastinal nodes, (SUV - 1.7-2.2 right adrenal soft tissue

Access this article online

Quick Response Code:

Website: www.ijnm.in

DOI: 10.4103/0972-3919.142646

Address for correspondence:
Dr. Arvind Krishnamurthy, Cancer Institute (WIA), 38, Sardar Patel Road, Adyar, Chennai - 600 020, Tamil Nadu, India.
E-mail: drarvindkrishnamurthy@yahoo.co.in

lesion (SUV - 4.6), and multiple nodules (SUV - 3.2) along the body and tail of the pancreas [Figure 2a and b].

A palliative total thyroidectomy [Figure 3a and b] was contemplated in view of the compressive and obstructive symptoms, the final histopathology of which revealed an 8 cm × 7 cm × 4.5 cm tumor replacing entire right lobe of the thyroid, which on microscopy revealed a neoplasm arranged as nests of cells with round to oval nuclei, clear cytoplasm, and fibro-vascular septa. The thyroid follicles were compressed at periphery, capsular infiltration, and occasional vascular tumor emboli were also noted. The final diagnosis confirmed the preoperative diagnosis of metastatic RCC, clear cell type, Fuhrmann grade III, with an additional focus of papillary micro carcinoma in the left lobe of the thyroid [Figures 4a-d, 5a-d]. The patient made an uneventful recovery and was subsequently started on targeted therapy (tablet sunitinib 50 mg orally once a day) and continues to be on follow-up for 4 months, relieved of his compressive symptoms.

DISCUSSION

The vast majority of the malignant tumors that involve the thyroid gland are primary tumors which include papillary, follicular, medullary, and anaplastic carcinomas. Metastatic carcinomas to the thyroid gland are an uncommon finding in clinical practice.[1] Primary tumors of the kidney (48.1%), colorectal (10.4%), lung (8.3%) breast (7.8%), and sarcoma (4.0%) are the most common tumors reported to metastasize to the thyroid.[2]

It has been widely believed that the thyroid gland, because of its abundant vascular supply is a vulnerable site for metastatic involvement.[3] A few authors have additionally proposed that the susceptibility of the thyroid gland to metastatic growth is increased when affected by goiter, neoplasms, or thyroiditis, and this can be explained due to metabolic changes in the thyroid gland, some other authors have, however, refuted this claim.[3] The metastatic clear cell RCC of our patient coexisted with papillary microcarcinoma.

Metastasis from RCCs has been reported to account for nearly 12-34% of all secondary thyroid tumors.[1] These tumors may represent the first manifestation or may present as a synchronous or metachronous metastasis in a preexisting clear cell renal carcinoma. The metastases usually are reported to appear as metachronous lesions, often several years after nephrectomy.[4]

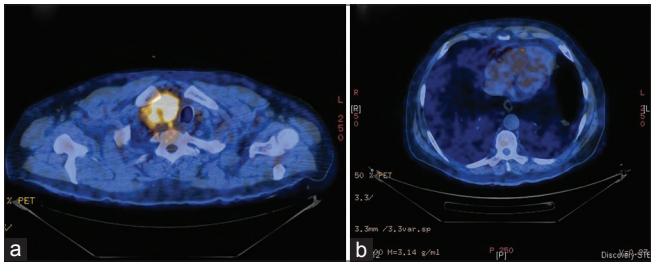

Figure 1: (a) Positron emission tomography (PET)-computed tomography showing an ill-defined heterogeneous mass with a large necrotic component and increased metabolic activity in the right lobe of thyroid standardized uptake value (SUV - 7.2) which was causing mass effect over right neck great vessels and trachea. (b) PET avidity in the nodule in left lower lobe lung (SUV - 1.7)

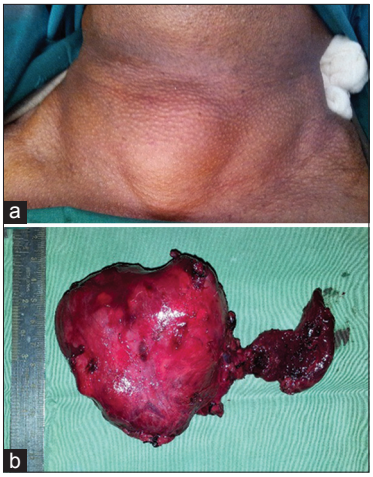

Figure 3: (a) Clinical photograph showing the 8 cm × 8 cm swelling arising from the right lobe of thyroid (b) clinical specimen photograph following palliative total thyroidectomy

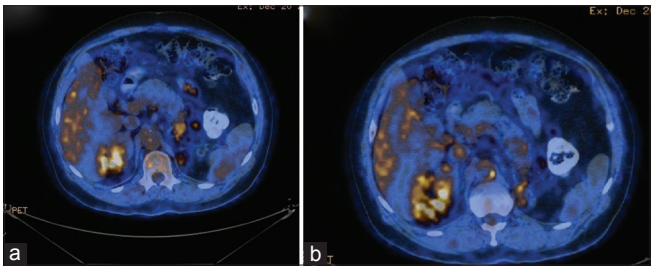

Figure 2: (a and b) Positron emission tomography-computed tomography scan showing right adrenal soft tissue lesion standardized uptake value (SUV - 4.6) and multiple nodules along the body and tail of the pancreas (SUV - 3.2)

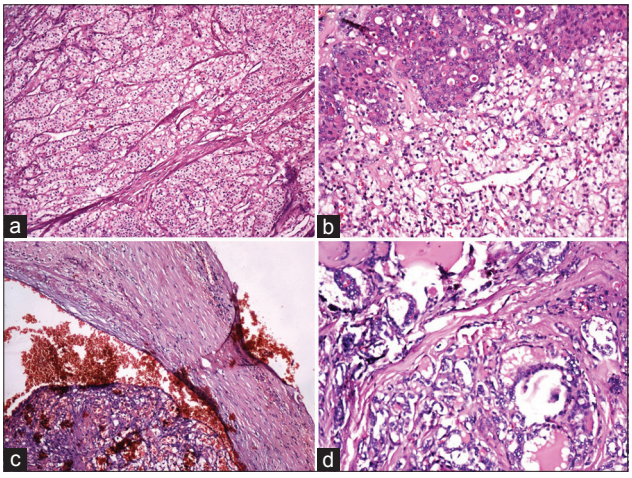

Figure 4: (a and b) Microscopy examination of the thyroidectomy specimen revealed a neoplasm arranged as nests of cells with round to oval nuclei, clear cytoplasm, and fibro-vascular septa. The thyroid follicles were compressed at periphery, capsular infiltration (H and E, ×20) (c) Vascular tumor emboli (H and E, ×10). (d) An additional focus of papillary micro carcinoma in the left lobe of the thyroid (H and E, ×10)

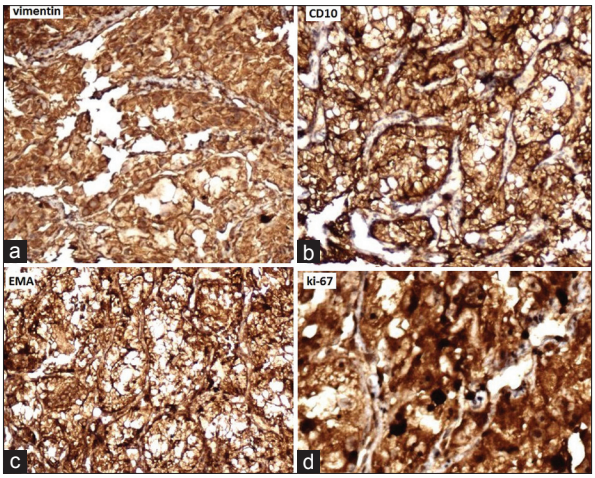

Figure 5: (a) Tumor cells showing immunopositivity to vimentin, immunohistochemistry (IHC, ×10) (b) tumor cells with immunopositivity to CD10 (IHC, ×10) (c) tumor cells with immunopositivity to epithelial membrane antigen (IHC, ×10) (d) tumor cells with immunopositivity to ki-67 (IHC, ×10)

Although metastasis to the thyroid gland should be suspected in patients with a history of renal tumors, a definitive preoperative diagnosis of primary versus a secondary tumor may not always be straightforward. The radiological findings are similar in both the scenarios. An FNAC of thyroid gland is useful in the diagnosis of secondary tumors as well. A core needle biopsy is, however, recommended when cytological results are uncertain.[3] The differential diagnosis for tumors with clear cell appearance should include paragangliomas, differentiated thyroid cancer, lung, and salivary gland secondary tumors. A background knowledge of the primary tumor would aid the pathologist in choosing the appropriate IHC markers for confirmation of the final diagnosis,[1] as was used in our patient.

There are no clear guidelines regarding the role of thyroidectomy in secondary thyroid tumors from RCCs since most clinical studies have included a small numbers of patients.[5] A hemi or a total thyroidectomy is generally recommended in patients with no other metastases; wherein the long term prognosis is good.[6-8] A palliative thyroidectomy is usually reserved for patients with disseminated disease only in the presence of compressive symptoms[9] as was successfully done in our patient. Interestingly, the previously described association of thyroid and pancreatic metastases of RCC was also noted in our patient.[5] The management of metastatic RCCs has undergone dramatic changes over the last decade, and this has mostly been due to the introduction of many targeted agents which have had a positive impact on the overall survival. The role of metastasectomy in the era of targeted therapy is evolving and needs to be better elucidated.[10]

CONCLUSION

The possibility of metastatic RCC should be kept as a differential during the course of the evaluation of clear cell tumor of the thyroid gland, more so when found in a patient with a prior history of renal tumor, irrespective of the duration. The coincidental association of thyroid and pancreatic metastases in RCC needs to be further explored. Metastatectomy has the potential to improve the quality of life and possibly survival in a selected group of patients and should be judiciously used in patients with secondary thyroid tumors from an RCC.

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How to cite this article: Krishnamurthy A, Deen S, Ramshankar V, Majhi U. Palliative thyroidectomy in the setting of a metastatic renal cell carcinoma. Indian J Nucl Med 2014;29:273-5

Source of Support: Nil. **Conflict of Interest:** None declared.