

# A case report and literature review on the possibility that a primary renal neoplasm and a metastatic papillary thyroid carcinoma could be clinically confused

**Noha ED Hassab El-Naby**

Department of Pathology, Faculty of Medicine, Sohage University, Egypt.

## Corresponding Author:

Noha ED Hassab El-Naby, Department of Pathology, Faculty of Medicine, Sohage University, Egypt.

**Received Date :** June 12, 2023

**Accepted Date :** June 15, 2023

**Published Date :** July 13, 2023

## ABSTRACT

The most prevalent thyroid tumour is papillary thyroid carcinoma. Regional lymph node metastasis is extremely common at the time of original presentation.

Vascular dissemination is a highly unusual occurrence, though. The most common locations for vascular metastasis from papillary thyroid carcinoma are the lungs and bones.

### Instance issues

The pathology lab at Sohag University's archive held the presently under discussion case. A 46-year-old female patient was brought to the Sohag University's department of urology in 2015. There were no other clinical details listed on the patient's referral document other than a left loin pain. Radical left nephrectomy was done after radiological results showed a renal tumour.

An examination of the histopathology showed a circumscribed neoplasm made up of tightly clustered acini and sparse stroma.

Renal disease was identified in the subject. Oncocytoma.

After a second look at the Hematoxylin and

Eosin-stained images, it was discovered that the nuclear characteristics were distinct from those mentioned in renal oncocytomas. A series of immunohistochemistry markers (anti-CK7, anti-EMA, anti-Vimentin, anti-Thyroglobulin, and anti-TTF1) were therefore applied.

**conclusion :** papillary thyroid cancer may spread to the kidney and develop a single tumour that resembles a primary renal neoplasm.

## INTRODUCTION

The most frequent malignant neoplasm in females and the most prevalent carcinoma in females under the age of 25 is thyroid cancer.

The most prevalent thyroid cancer is papillary thyroid carcinoma (PTC). About 90% of thyroid cancer diagnoses in 2017 were PTC, while the remaining 10% were follicular carcinoma, Hurthle cell carcinoma, medullary, and anaplastic carcinomas [1].

With a very high incidence of regional lymph node metastasis approaching 50% of cases at the time of first presentation, PTC frequently invades intraglandular lymphatics [2]. Venous invasion, however, only occurs in 7% of instances on average. A majority of Lungs and bones are frequent locations for remote metastasis [3].

Here, we describe a female patient who was in her fifth decade of life and had malignant PTC in her kidney. The case was found in the pathology lab's collection at Sohag University while searching for tissue blocks that had previously been identified as renal neoplasms and were formalin-fixed and paraffin-embedded. Lungs and bones are frequent locations for distant metastases [3]. Here, we describe a female patient who was in her fifth decade of life and had metastatic PTC in her kidney. The instance was discovered while collecting tissue blocks that had previously been identified as kidney neoplasms from the pathology lab archive at Sohag University. We present a case. Information about the patient and clinical results: a 46-year-old female patient was admitted to the Sohag University's department of urology in 2015. The

patience struggled for three months from left oblique ache. Her abdominal ultrasound revealed a left renal tumour that was located in the higher pole. As a result, the patient underwent a left radical nephrectomy, and the pathology lab received the specimen. The referral page did not offer any additional clinical information. Pathological features According to the archived pathology report, the specimen's gross features showed that the upper pole of the removed kidney was occupied by a non-capsulated, soft, and spherical mass. The mass was around 2.7x3.5x4 cm in size, with a heterogenous cut section, and was a dark red colour. The bulk didn't penetrate the peri-renal fat that was linked. Microscopic details showed a well-defined, non-capsulated cellular development made up of tightly clustered glands. Several of these glands had cystic dilation, and the homogeneous, pale eosinophilic material they contained occasionally had scalloping around the edges. These glands' lining cells were cuboidal and had a fair proportion of light eosinophilic cytoplasm. The stroma was thin-walled and ectatic, with few cells.

vascular pathways. The surrounding renal tissue lacked any notable features. The renal oncocytoma diagnosis is the most suitable one based on these histology findings. However. These cancerous cells have attractive nuclear characteristics that were found everywhere. The nuclei were large and optically clear with frequent nuclear grooving and indentations, and upon re-examining the Hematoxylin and Eosin (H&E)-stained slides, we discovered a nuclear overlapping. studying immunohistochemistry Several 4 m tissue slices were cut from the paraffin blocks and stained immunohistochemically with antibodies to thyroid transcription factor-1 (TTF-1), epithelial membrane antigen (EMA), vimentin, and cytokeratin 7. (CK7). We found that the cancerous cells' thyroglobulin expression was both strong and widespread, cytoplasmic, and membranous. TTF1 nuclear expression was seen in the acini and neoplastic glands.

CK7 was expressed in the cytoplasm of both cancerous cells and healthy renal tubules. Neoplastic cells lacked expression Discussion The most prevalent malignant tumour of the endocrine system is thyroid cancer [2]. PTC makes up over 90% of all thyroid malignancies, making it the subtype of thyroid carcinoma that occurs most commonly. In the vast majority of cases, the tumour is nicely differentiated. instances, which begins as a painless nodule that eventually grows [4]. When PTC is initially diagnosed, lymphatic dissemination to local lymph nodes is fairly common. Such nodal metastasis, however, has no negative effects on the prognosis [2]. With PTC, distant

spread in the blood stream is extremely rare, and if it does happen, the prognosis is typically worse [3]. Metastatic deposits from primary thyroid cancer are extremely rare to find in the kidney, and the majority of documented instances are typically of the follicular subtype. Thyroid follicular carcinoma reported in more than PTC was recorded in only 13% of cases, compared to 50% of thyroid carcinomas that metastasized to the kidney in earlier literatures [5]. Moreover, it has been discovered that intra-renal metastatic deposits from primary thyroid cancer typically appear a considerable amount of time after the thyroid tumour has been removed. Hence, any renal tumour may be mistaken for a primary renal neoplasm [6].

### Discussion

A female patient in our case experienced left loin pain for three months. X-ray results showed a kidney mass in the left upper pole. A primary kidney neoplasm was strongly supported by the clinical and radiological evidence. The mass was single and filled the top pole of the kidney, which is the most common location for primary renal neoplasms, and this was supported by the gross pathological characteristics. main renal cancers' site of origin. It was really confusing to see microscopic features. Architecturally, the tumour was ringed by closely spaced glands and acini with little intervening stroma. an image that looks like renal oncocytoma. The nuclei were crowded and optically transparent, and there were numerous nuclear indentations and grooves, which set them apart from renal oncocytomas in terms of their nuclear characteristics. There was no argument that could be relied upon to explain these nuclear findings due to limited clinical information in the referral sheet and the patient's lack of contact following her radical nephrectomy. An immunohistochemistry marker cocktail was strongly advised after a second look at the slides. CK7, Vimentin, EMA, TTF1, and thyroglobulin antibodies were used to stain tissue sections. Strongly and widely expressed CK7 was found in the tumour cells. Renal oncocytoma is well documented to be CK7-negative or to exhibit patchy distribution [7]. The thyroid-like follicular form of renal cell carcinoma (TLFRCC) and a metastatic PTC were two other theories that were strongly advocated. The first is a primary renal epithelial neoplasia that is uncommon. The first mention of it occurred in 2006. Renal cell carcinoma indicators including EMA, Vimentin, and PAX8 are positive for this tumour, although it is exclusively benign.

Thyroglobulin and TTF1 thyroid indicators are negative [8, 9]. The tumour cells in our case did not express EMA or

Vimentin. However, we found that the tumour cells expressed Thyroglobulin diffusely and strongly in their cytoplasm and membranes, and they also expressed TTF1 positively in their nuclei. The diagnosis of metastatic papillary thyroid cancer to the kidney was confirmed based on the results. In summary, vascular metastasis from PTC is a rare occurrence, and when it does happen, it typically spreads to the lungs and bones. Nevertheless, the spread of PTC by blood born may occur in the kidneys. In such suspected cases, a panel of immunohistochemistry markers particular to thyroid and renal tissues might be required to make the correct diagnosis. Conflicts of interest The authors claim to have no conflicts of interest. Funding This study did not receive any funding. abbreviations lists Hematoxylin and Eosin, Epithelial Membrane Antigen, Thyroid Transcription Factor-1, Papillary Thyroid Cancer, CK7, Cytokeratin 7, and Thyroid-Like Follicular Variant of Renal Cell Carcinoma.

## Conclusion

papillary thyroid cancer may spread to the kidney and develop a single tumour that resembles a primary renal neoplasm.

## REFERENCES

1. Rossi ED, Pantanowitz L, Hornick JL. A worldwide journey of thyroid cancer incidence centred on tumour histology. *The Lancet. Diabetes & Endocrinology*. 2021 04;9(4):193-194. [https://doi.org/10.1016/S2213-8587\(21\)00049-8](https://doi.org/10.1016/S2213-8587(21)00049-8)
2. Khoozestani NK, Mosavat F, Shirkhoda M, Sedaghati A. Metastatic papillary thyroid carcinoma of the mandible: Case report and literature review. *Journal of oral and maxillofacial pathology: JOMFP*. 2019 02;23(Suppl 1):97-Figure 6. Expression of EMA in Normal Renal Tubules but not the Neoplastic Cells, X 20. Figure 7. Expression of Vimentin in the Intervening Stroma between the Neoplastic cells, X 20.105. [https://doi.org/10.4103/jomfp.JOMFP\\_106\\_18](https://doi.org/10.4103/jomfp.JOMFP_106_18)
3. Gao Y, Deng W, Chen Y, Fan Y, Guo Z. Renal metastases as the initial presentation of papillary thyroid carcinoma: A case report and literature review. *Molecular and Clinical Oncology*. 2017 06;6(6):821-824. <https://doi.org/10.3892/mco.2017.1243>
4. Anajar S, Hassnaoui J, Rouadi S, Abada R, Roubal M, Mahtar M. Mandibular metastasis revealed papillary thyroid carcinoma: Rare case. *International Journal of Surgery Case Reports*. 2017 05 18;37:130-133. <https://doi.org/10.1016/j.ijscr.2017.05.001>
5. Malhotra G, Upadhye TS, Sridhar E, Asopa RV, Garde PS, Gawde S, Rangarajan V. Unusual case of adrenal and renal metastases from papillary carcinoma of thyroid. *Clinical Nuclear Medicine*. 2010 09;35(9):731-736. <https://doi.org/10.1097/RLU.0b013e3181ea342b>
6. Farina E, Monari F, Tallini G, Repaci A, Mazzarotto R, Giunchi F, Panzacchi R, Cammelli S, Padula GDA, Deodato F, Pasquali R, Fanti S, Fiorentino M, Morganti AG. Unusual Thyroid Carcinoma Metastases: a Case Series and Literature Review. *Endocrine Pathology*. 2016 03;27(1):55-64. <https://doi.org/10.1007/s12022-015-9410-7>
7. Wu SL, Kothari P, Wheeler TM, Reese T, Connelly JH. Cytokeratins 7 and 20 immunoreactivity in chromophobe renal cell carcinomas and renal oncocytomas. *Modern Pathology: An Official Journal of the United States and Canadian Academy of Pathology, Inc*. 2002 07;15(7):712-717. <https://doi.org/10.1097/01.MP.0000017566.29755.8A>
8. Zhang Y, Yang J, Zhang M, Meng Z, Song W, Yang L, Li L, Wang D, Shi T. Thyroid follicular carcinoma-like renal tumor. *Medicine*. 2018 05 25;(21):e10815. <https://doi.org/10.1097/MD.0000000000010815>