

## Visual Vignette

# Thyroid Metastases From Renal Cell Carcinoma Presenting as Thyroid Nodules With Involvement of an Adjacent Vein



Veronica Calabrò, MD<sup>1</sup>, Chiara Dobrinja, MD, PhD<sup>2,3</sup>,  
Marco Francesco Maria Cavallaro, MD<sup>4</sup>, Giulia Manfredi, MD<sup>3</sup>, Claudia Di Lecce, MD<sup>3</sup>,  
Fulvia Martellani, MD<sup>5</sup>, Stella Bernardi, MD, PhD<sup>1,3,\*</sup>

<sup>1</sup> SS Endocrinologia, SC (UCO) Medicina Clinica, Azienda Sanitaria Universitaria Isontino Giuliana, Ospedale di Cattinara, Trieste, Italy

<sup>2</sup> SC (UCO) Clinica Chirurgica Azienda Sanitaria Universitaria Isontino-Giuliana, Ospedale di Cattinara, Trieste, Italy

<sup>3</sup> Department of Medical Surgical and Health Sciences, University of Trieste, Ospedale di Cattinara, Trieste, Italy

<sup>4</sup> SC Radiologia, Azienda Sanitaria Universitaria Isontino-Giuliana, Ospedale Maggiore, Trieste, Italy

<sup>5</sup> SC (UCO) Anatomia e Istologia Patologica, Ospedale di Cattinara, Trieste, Italy

## ARTICLE INFO

### Article history:

Received 9 December 2024

Received in revised form

24 February 2025

Accepted 25 February 2025

Available online 10 April 2025

## Case Presentation

A 62-year old woman presented to our Endocrinology service in July 2023 after the surgical removal of both adrenal glands because of metastases from a clear cell renal carcinoma (CCRC). Her past medical history demonstrated that in 2011 the patient had surgery for a CCRC with a left adrenal metastasis, and in 2023, she underwent surgical removal of the right adrenal gland for a new metastasis, requiring hydrocortisone and fludrocortisone replacement therapy. In addition, she had a benign thyroid nodule, as assessed in March 2023 by an ultrasound scan with fine-needle aspiration cytology, revealing a single thyroid nodule measuring  $22 \times 19 \times 24 \text{ mm}^3$  (5.2 mL) with Bethesda II cytology. Because of this finding, we scheduled a follow-up ultrasound that was performed in April 2024. This new thyroid ultrasound showed not only multiple solid hypoechoic nodules

but also that the main nodule had changed. It now measured  $26 \times 21 \times 26 \text{ mm}^3$  (7.4 mL) and was adjacent to a solid hypoechoic tubular lesion (Fig. A), measuring  $10 \times 60 \text{ mm}^2$  and extending beyond the left lower pole into an enlarged vein (Fig. B), which suggested a possible thrombus formation in the left internal jugular vein. A whole-body computed tomography scan was consistent with the possibility of a tumor thrombus formation with no other localizations (Fig. C). At this stage we ordered a new fine-needle aspiration cytology examination, which showed Bethesda IV cells in the thyroid nodule and Bethesda V cells in the adjacent tubular lesion.

## What is the diagnosis?

### Answer

The patient underwent a total thyroidectomy, which showed the presence of a tumor thrombus adjacent to multiple thyroid metastases of a CCRC (Fig. D, E). Thyroid metastases represent approximately 2% of thyroid malignancies, and the most frequent source is CCRC.<sup>1</sup> Metastases are more common in women and in glands with abnormalities, including both malignant and benign nodules, because a normal thyroid environment is generally not hospitable to metastatic cells.<sup>1</sup> Most patients present with clinical complaints, but in 25% of cases, as in our patient, the nodule is discovered incidentally or during routine follow-up for a thyroid disease.<sup>2</sup> Ultrasound and Thyroid Imaging Reporting and Data System (TI-RADS) features are often nonspecific, but one of the aspects that should raise suspicion of thyroid metastases from CCRC is the radiological evidence of tumor thrombi, because they have the propensity to extend into the jugular veins.<sup>2</sup> Cytology can be often misleading because CCRC cells share many features with primary Hürthle cell tumors (uniform pattern of cells, low-grade to intermediate-grade nuclear features, and oncocyctic cytoplasm). However, immunostaining for CAIX and CD10, which is positive in CCRC, may be helpful, as in (Fig. E) showing a thyroid section immunostained for CD10. Immunostaining for thyroglobulin and TTF-1 is

*Abbreviations:* CCRC, clear cell renal carcinoma; TI-RADS, Thyroid Imaging Reporting and Data System.

**Editor's Note: Submissions to "Visual Vignettes" are welcomed. Please submit online via the Journal's Editorial Manager site.**

\* Address correspondence to Prof Stella Bernardi, Department of Medical Surgical and Health Sciences, University of Trieste, Cattinara Teaching Hospital, Strada di Fiume, 34100 Trieste, Italy.

E-mail address: stella.bernardi@units.it (S. Bernardi).

<https://doi.org/10.1016/j.aed.2025.02.006>

3050-9157/© 2025 American Association of Clinical Endocrinologists. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

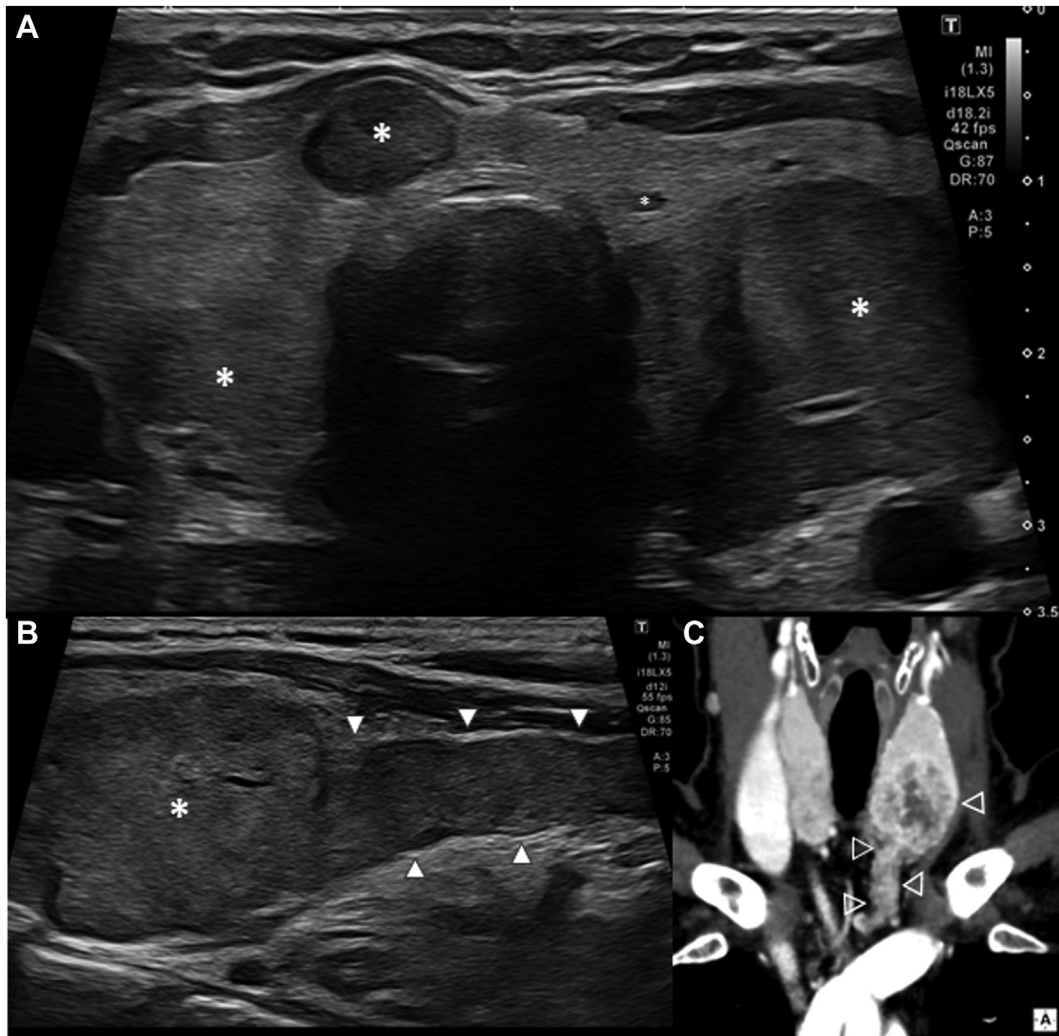


Fig.

negative.<sup>3</sup> Surgical excision remains the most appropriate diagnostic and therapeutic tool, because early detection and aggressive treatment may improve survival. In conclusion, our case is a reminder that CCRC metastases to the thyroid do not have specific TI-RADS features but mimic primary thyroid carcinoma. Some ultrasound features suggestive of malignant disease such as the involvement of adjacent veins, which are not exactly included in the TI-RADS score, should always be evaluated because they provide information on the risk of malignancy and should prompt fine-needle aspiration, irrespective of prior cytologic reports. Most importantly, history of benign thyroid

nodules does not rule out the presence of metastases to the thyroid; on the contrary, new nodules in the presence of non-thyroid malignancy are a red flag for thyroid metastases. Early detection and surgical intervention may prevent local recurrence and the development of complications such as thyrotoxicosis and extension into local structures.<sup>2</sup>

#### Disclosure

The authors have no conflicts of interest to disclose.

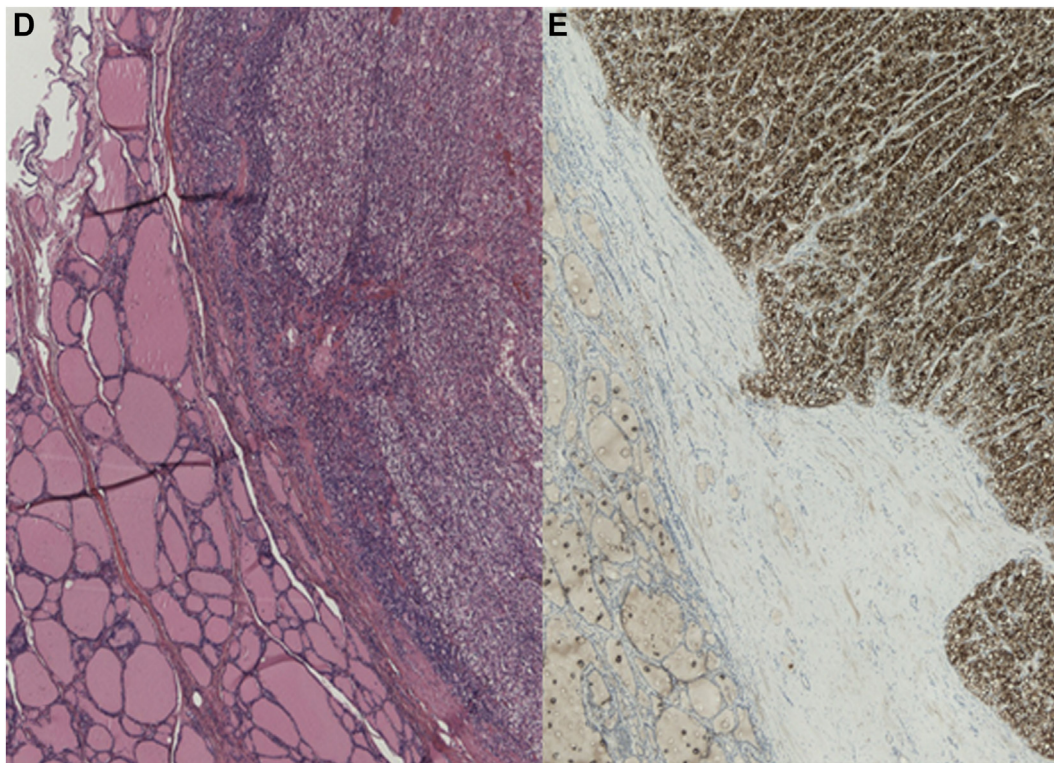


Fig. continue.

### Acknowledgment

This work did not receive any funding support to declare.

### Statement of Patient Consent

The patient has given her written informed consent to publish her case.

### References

1. Rossi ED, Bruno C, Tralongo P, et al. Updates from our institutional experience with thyroid nodules diagnosed as metastases. *Diagnostics (Basel)*. 2023;13(14): 2388.
2. Chung AY, Tran TB, Brumund KT, Weisman RA, Bouvet M. Metastases to the thyroid: a review of the literature from the last decade. *Thyroid*. 2012;22(3):258–268.
3. Puzstaszeri M, Wang H, Cibas ES, et al. Fine-needle aspiration biopsy of secondary neoplasms of the thyroid gland: a multi-institutional study of 62 cases. *Cancer Cytopathol*. 2015;123(1):19–29.