

**METASTATIC BREAST CANCER TO THE THYROID GLAND: A CASE REPORT AND
REVIEW OF THE LITERATURE*****Fatima-Zahra Kahouadji, Sihame Lkhoyaali, Saber Boutayeb, Ibrahim El Ghissassi, Hind M'rabti and Hassan
Errihani**

Medical Oncology Department at the National Institute of Oncology in Rabat Morocco.

***Corresponding Author: Dr. Fatima-Zahra Kahouadji**

Medical Oncology Department at the National Institute of Oncology in Rabat Morocco.

Article Received on 08/05/2023

Article Revised on 28/05/2023

Article Accepted on 18/06/2023

ABSTRACT

Breast cancer rarely metastasizes to the thyroid gland. We report a case history of a 40-year-old patient with inflammatory breast cancer treated with neoadjuvant chemotherapy at surgery, followed by adjuvant radiotherapy and hormonal therapy. After 4 years of diagnosis and treatment, she presented with a metastatic thyroid relapse revealed clinically by an anterior cervical swelling, biologically by thyroiditis unimproved by replacement therapy, histologically by thyroid biopsy and radiologically by pet scan. The evolution was favorable with a very good clinical and metabolic response after 6 months of 2nd-line chemotherapy.

INTRODUCTION

Metastatic breast cancer to the thyroid is rare (1). Breast cancer is the most commonly diagnosed cancer among women (2). The common sites for metastatic spread are bone, lungs, and liver (3). Metastases to the thyroid gland from a non-thyroid primary are uncommon and are mostly from the kidney, followed by gastrointestinal tract, lungs, skin, and rarely breast (4–5). Here, we report a rare case of breast cancer metastases to the thyroid gland.

CASE PRESENTATION

Patient aged 40, no particular history, followed since 2018 for an inflammatory breast cancer initially classified cT4dN1M0 RH + (RE:80%, RP: 0%), Ki67: 40%, HER2 low (score 1+) having received a sequential neoadjuvant chemotherapy: 4 courses AC60 then 4 courses of docetaxel, then the patient benefited from a mastectomy. Pathological examination of the surgical specimen showed no invasive or in situ carcinomatous residue, presence of vascular emboli, presence of carcinomatous lymphangitis in the nipple, lymph node dissection: 14N-/14N with therapeutic effects. Stages ypT0N0/TNM (8th edition). She then received radiotherapy followed by adjuvant tamoxifen-type hormone therapy combined with medical castration for 3 years. In 2022, the patient presented with an anterior cervical swelling and thyroiditis which did not improve with replacement therapy. A thyroid biopsy showed a carcinomatous process of breast origin RH + (RE: 10%, RP: 0%), HER2 negative (score 0). A pet scan was ordered, which revealed heterogeneous pathological hypermetabolism of the thyroid gland, pathological nodal

foci in the mediastinum, bilateral pleural effusion more abundant on the right, significant pericardial effusion, small condensing focus at L4 level in favor of an incipient secondary localization.

The patient was referred to a cardiologist for an opinion on her pericardial effusion. The decision was made to initiate 2nd-line palliative chemotherapy with paclitaxel weekly carboplatin. An evaluation after 3 months by pet scan showed a reduction in thyroid hypermetabolism, a significant reduction in active mediastinal lymph node foci, disappearance of bilateral pleural effusion of moderate abundance on the right, of low abundance on the left, pericardial effusion, disappearance of the L4 focus. Very good clinical and metabolic response. After 6 months of treatment (6 courses), a pet scan revealed complete disappearance of active ganglionic foci in the mediastinum, persistence of very slight hypermetabolism in the thyroid gland, and absence of the L4 focus. The patient was subsequently maintained on medical castration, letrozole-type hormone therapy and ribociclib® anti CD4/6.



Figure 1: Baseline 18 FDG positron emission tomography image showing heterogeneous pathological hypermetabolism of the thyroid gland.

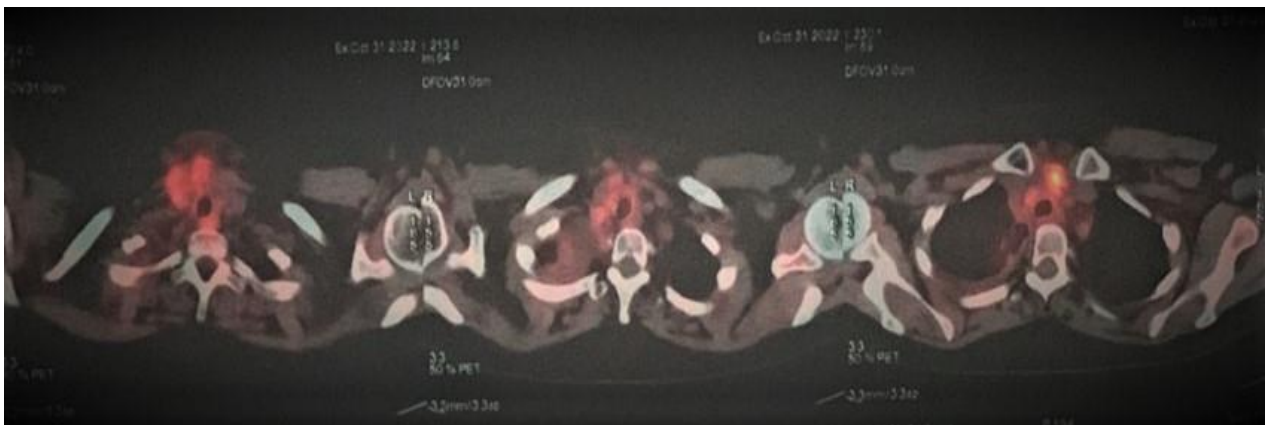


Figure 2: Baseline 18 FDG positron emission tomography image showing heterogeneous pathological hypermetabolism of the thyroid gland.

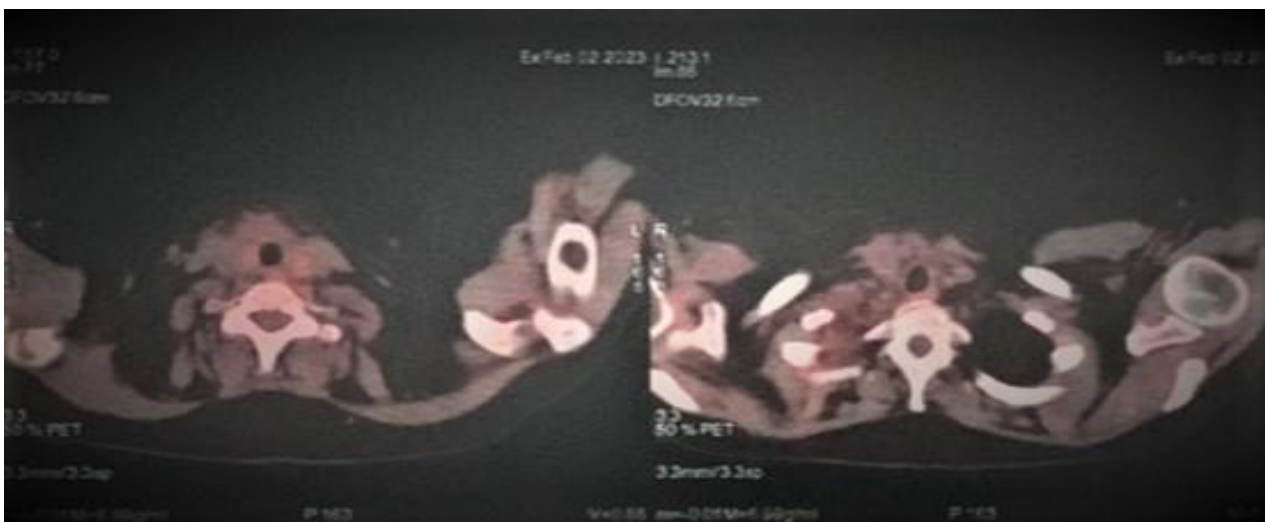


Figure 3: 18 FDG positron emission tomography image after 3 cycles of 2nd-line chemotherapy showing a decrease in heterogeneous pathological hypermetabolism of the thyroid gland.

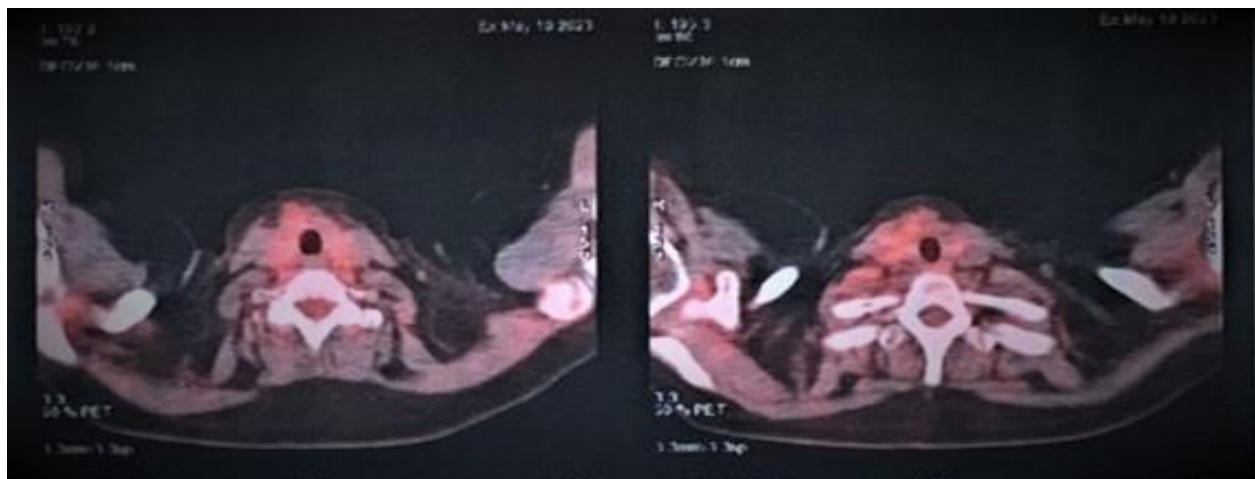


Figure 4: 18 FDG positron emission tomography image after 6 cycles of 2nd-line chemotherapy showing the persistence of very discrete hypermetabolism in the thyroid gland.

DISCUSSION

The thyroid is rarely the site for metastatic deposits.^[6] The thyroid's high blood flow and high iodine content explain this rarity.^[11]

The most common primary cancer to metastasize to the thyroid is renal cell carcinoma, followed by malignancies of the gastrointestinal tract, lungs, and skin, with breast cancer metastases to the thyroid being rare.^[6]

If the thyroid mass is detected in a patient with extra thyroid malignant tumors, or uncommon morphology of the thyroid mass is present on pathologic examination, a suspicion for metastatic thyroid tumor should be raised.^[4]

Therefore, an individual presenting with both thyroid and breast malignancy is more likely to have primary cancer of thyroid and breast, rather than breast metastases to the thyroid.^[6]

Up to 80% of thyroid metastases are metachronous.^[7] with mean intervals from as little as 2.3 years in head and neck cancer.^[5,8] to as long as 21 years in the case of foregut neuroendocrine tumors.^[12] Other metachronous tumors present varying levels of delay with a mean of 9.4 years in renal cell carcinoma primaries.^[9] and 48.2 months.^[7] in breast primary malignancies.

In our case, the patient developed thyroid metastasis 4 years after breast cancer diagnosis and treatment which joins the literature.

Longer delays in metachronous tumors probably reflect a less aggressive biology and in fact the rarer synchronous metastases to the thyroid are associated with a much poorer prognosis with a mean 5-year survival rate of 7.9%.^[10] In summary, breast cancer metastases to the thyroid gland can present many years after treatment of the primary cancer. Cytological morphology and

immunohistochemistry can help distinguish primary and secondary tumors.^[1]

CONCLUSION

In the presence of any previous cervical swelling or thyroiditis unimproved by replacement therapy in a patient previously treated for breast cancer, it is important not to underestimate thyroid metastases, despite their rarity after ruling out primary thyroid cancer.

REFERENCES

1. Z. Yang a, X. Cai a, X. Cao a, C. Zhao b, H. Lu. Metastatic breast cancer to the thyroid diagnosed by fine-needle aspiration cytology: A case report and literature review. *Human Pathology Reports*, 2022; 28: 300622.
2. Siegel RL, Miller KD, Jemal A. Cancer statistics. *CA Cancer J Clin*, 2016; 66: 7–30.
3. Weigelt B, Peterse JL, van't Veer LJ. Breast cancer metastasis: markers and models. *Nat Rev Cancer*, 2005; 5: 591–602.
4. Moghaddam PA, Cornejo KM, Khan A. Metastatic carcinoma to the thyroid gland: a single institution 20-year experience and review of the literature. *Endocr Pathol*, 2013; 24: 116–24.
5. Hegerova L, Griebeler ML, Reynolds JP, Henry MR, Gharib H. Metastasis to the thyroid gland: report of a large series from the Mayo Clinic. *Am J Clin Oncol*, 2015; 38: 338–42.
6. Agata M, Plonczak, Aimee N. DiMarco, Roberto Dina, Dorothy M. Gujral and Fausto F. Palazzo. Breast cancer metastases to the thyroid gland – an uncommon sentinel for diffuse metastatic disease: a case report and review of the literature. *Journal of Medical Case Reports*, 2017; 11: 269.
7. 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: 258–68.

8. Nakhjavani MK, Gharib H, Goellner JR, van Heerden JA. Metastasis to the thyroid gland. A report of 43 cases. *Cancer*, 1997; 79: 574–8.
9. Heffess CS, Wenig BM, Thompson LD. Metastatic renal cell carcinoma to the thyroid gland: a clinicopathologic study of 36 cases. *Cancer*, 2002; 95: 1869–78.
10. Chen JY, Chen IW, Hsueh C, Chao TC, Gao BR, Lin JD. Synchronous diagnosis of metastatic cancer to the thyroid is associated with poor prognosis. *Endocr Pathol*, 2015; 26: 80–6.
11. I. Thiam, K. Doh, S. Hassan Farah, E. Tagba, A. Leloua, G. Woto-Gaye. Intra-thyroid metastasis and the pathologist. *Annales de pathologies*, April 2017; 170-174.
12. Mattavelli F, Collini P, Pizzi N, Gervasoni C, Pennacchioli E, Mazzaferro V. Thyroid as a target of metastases. A case of foregut neuroendocrine carcinoma with multiple abdominal metastases and a thyroid localization after 21 years. *Tumorim* 2008; 94: 110–3.