https://doi.org/10.5272/jimab.2025313.6447

Journal of IMAB
ISSN: 1312-773X
https://www.journal-imab-bg.org

Journal of IMAB. 2025 Jul-Sep;31(3)

Case report

THYROID METASTASES FROM OVARIAN SEROUS CARCINOMA: A RARE CASE REPORT

Doroteya Malinova[1, 2], Radina Dimitrova[3, 4], Mira Siderova[3, 4], Borislav Chaushev[5, 6]

1) Department of General and Clinical Pathology, Forensic Medicine and Deontology, Faculty of Medicine, Medical University - Varna, Bulgaria.
2) Clinic of General and Clinical Pathology, University Hospital St. Marina, Varna, Bulgaria.
3) Second Department of Internal Diseases, Faculty of Medicine, Medical University - Varna, Bulgaria.
4) Clinic of Endocrinology and Metabolic Diseases, University Hospital St. Marina, Varna, Bulgaria
5) Department of Periodontology and Dental Implantology, Faculty of Dental Medicine, Medical University - Varna, Bulgaria.
6) Clinic of Nuclear Medicine, University Hospital St. Marina, Varna, Bulgaria.

ABSTRACT

Introduction: We present a female patient with ovarian serous papillary carcinoma with thyroid gland metastases and metastases to cervical lymph nodes. Ovarian serous papillary carcinoma accounts for the majority of ovarian carcinoma diagnoses and related deaths. It is characterized by an advanced disease at presentation in about 80% of cases. It is associated with elevated serum CA-125 levels. Metastases of ovarian carcinoma to the thyroid gland are very rare, with only four cases reported in the literature.

Case report: A 73-year-old woman presented to "St Marina" University Hospital in Varna, Bulgaria. She had been experiencing dyspnoea and a change in her voice over the past month. She was diagnosed with ovarian carcinoma five years ago. The clinical exam showed an enlarged thyroid gland and cervical lymph nodes enlargement. The imaging tests revealed a tumor mass in the thyroid gland and cervical lymph nodes, as well as generalized lymphadenopathy. Fine-needle aspiration (FNA) biopsy was performed, and the findings in the thyroid gland and in one of the lymph nodes were assessed as metastatic lesions from ovarian carcinoma. The cytology was negative for primary thyroid tumor, as well as thyroglobulin was negative in the lymph node wash out.

Conclusions: Metastases to the thyroid gland are very rare and should be considered when evaluating a patient with advanced ovarian cancer. FNA remains a sensitive and specific method for detecting malignant lesions in the thyroid gland.

Keywords: ovarian carcinoma, metastases, thyroid gland, FNA, CA-125,

INTRODUCTION

Metastases to the thyroid gland are very rare, the reported frequency in the literature varies between 1.4 and 2.5% among all thyroid malignancies [1]. Renal and lung carcinomas are the most common primary malignant tumors that spread to the thyroid [1, 2]. Metastases from primary ovarian carcinomas are extremely uncommon, with only four cases reported in the literature [3, 4, 5, 6]. We present a case of ovarian serous papillary carcinoma that metastasized to the thyroid gland and cervical lymph nodes.

CASE PRESENTATION

A 73-year-old woman was admitted to "St Marina" University Hospital in Varna, Bulgaria. An information leaflet was offered, and written informed consent was obtained from the patient. She had complained of severe fatigue that started a year ago. During the last month, she had suffered from dyspnoea and a change in her voice. Five years ago, she was diagnosed in another hospital with poorly differentiated ovarian serous papillary carcinoma - pT3cN0Mx, G3. Total hysterectomy with adnexectomy was performed. Following surgery, she received six cycles of chemotherapy.

Her medical history also included arterial hypertension, dyslipidaemia, chronic maxillary sinusitis, mastoiditis. Coronary angiography was performed 3 months ago - no evidence of coronary artery disease, head MRI was performed 6 months ago - everything appeared normal.

The clinical exam showed an enlarged thyroid gland and cervical lymph nodes enlargement. Breathing sounded vesicular without wheezes. On heart auscultation, there was a rhythmic heartbeat. There were no abnormalities during the abdominal exam, only a postoperative cicatrix was discovered due to previous laparotomy and hysterectomy.

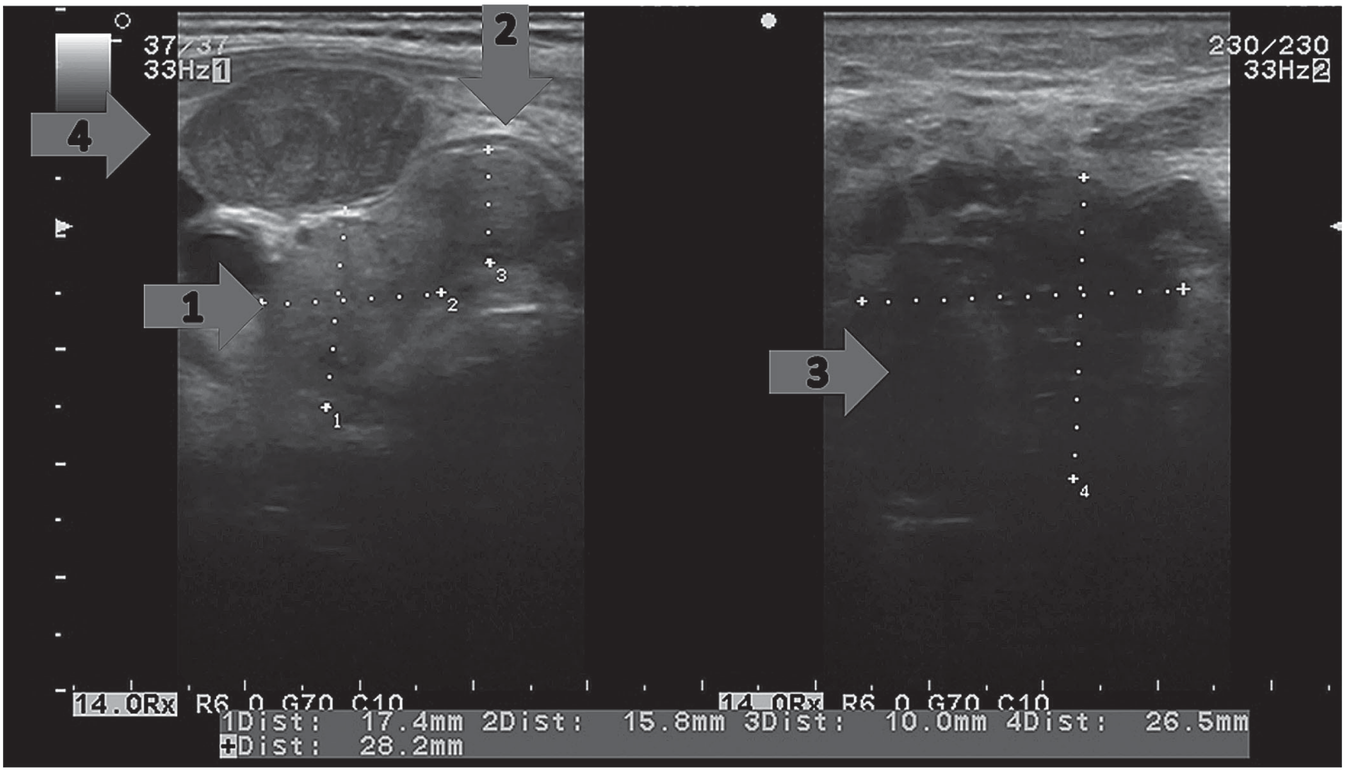
Her thyroid function tests demonstrated a thyroid stimulating hormone of 9.31 u[IU]/mL, free T4 of 12.84 pmol/L (n 10.3-24.0), AntiTG(TAT) - 488.0 [IU]/mL (n<95), AntiTPO(MAT) - 65.16 U/mL (n<34), TG - 1.06 ng/mL, consistent with subclinical hypothyroidism and autoimmune thyroiditis (table 1).

The thyroid gland ultrasound revealed a heterogeneous isoechoic structure in the thyroid gland parenchyma in the right lobe and isthmus measuring 17.7x15.8 mm. A heterogeneous hypoechoic parenchymal mass was discovered in the left lobe, measuring 26.5x28.2mm. Bilateral cervical lymphadenopathy was detected at all levels. The lymph nodes were round, without a visible hilum and with net-like structure. A dominant lymph node on the left was measured - 34.5x20.7mm (fig. 1).

Table 1. Laboratory tests – thyroid function, thyroid antibodies, thyroglobulin (serum and lymph node wash out, tumor marker CA 125.

	Value	**Reference range**
TSH	**9.31** mIU/L	0.2 - 4.2 mIU/L
FT4	12.84 pmol/L	10.3 - 24 pmol/L
Anti – TPO (MAT)	65.16 IU/mL	< 12 IU/mL
Anti – TG (TAT)	488 IU/mL	< 95 IU/mL
Serum TG	1.06 ng/mL	3.5 – 77 ng/mL
TG wash out from lymph node	<0.040 ng/mL	<0.040 ng/mL
CA 125	62.4 U/mL	< 21 U/mL

Fig. 1. Thyroid ultrasound. Arrows: 1. Right thyroid lobe with heterogeneous isoechoic structure; 2. Enlarged isthmus; 3. Left thyroid lobe involved by hypoechoic parenchymal mass 4. Pathologically altered lymph node.



FNA biopsy of the left thyroid lobe and dominant lymph node was performed. The pathology report described multiple groups and papillary-like structures of large atypical cells with large irregular nuclei with several prominent nucleoli, presence of crush artefact and degenerative changes (fig. 2. A, B). The final diagnosis was: Bethesda VI - Malignant cytology - metastases in thyroid gland and lymph node from poorly differentiated carcinoma (the morphology does not suggest primary thyroid gland carcinoma).

Fig. 2A. The cytological result after FNA biopsy of the left thyroid lobe.

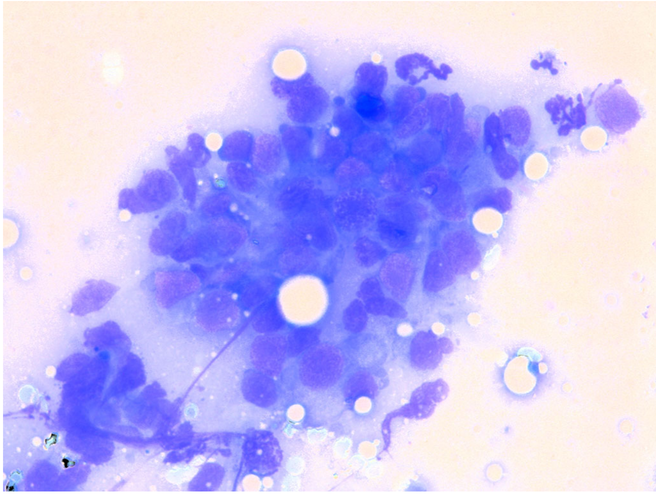
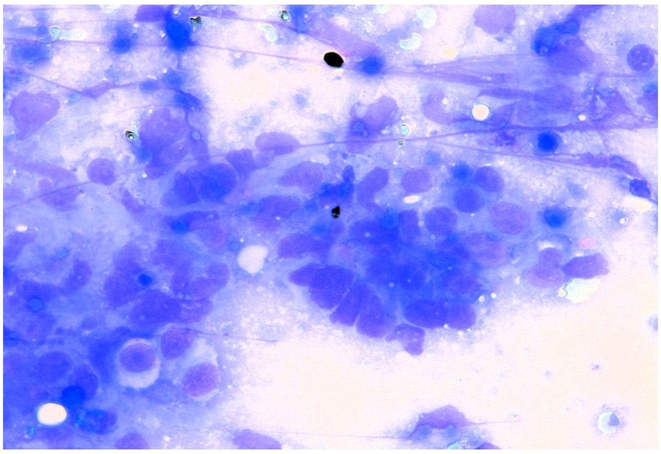


Fig. 2B. The cytological result after FNA biopsy of the lymph node.



Thyroglobulin (Tg) levels in the fluid obtained from the FNA biopsy of the lymph node were measured. Tg levels in the washout fluid were low (TG<0,040 ng/mL), excluding the presence of thyroid cancer cells in the lymph node. CA125 levels were elevated at 62.4 U/mL (n<21) – table 1.

The computed tomography (CT) showed generalized lymphadenopathy with a large parenchymal mass in the neck near the common jugular vein and protruding into the mediastinum - probably confluent lymph nodes. Hepatosplenomegaly was described.

Fig. 3. PET-CT of the whole body.

PET-CT revealed a large tumor mass in the left lobe of the thyroid gland, isthmus and part of the right lobe, protruding into the mediastinum. Diffuse lymphadenopathy was detected with multiple metastatic lymph nodes throughout the body, multiple metastatic lesions in bones (fig. 3).

A multidisciplinary team gathered an decided that this was a progression of the ovarian carcinoma, and the patient was sent to the Department of Medical Oncology for treatment.

DISCUSSION

The thyroid gland is a very rare site of metastatic disease, and the reasons are a combination of anatomical, physiological, and tumor biology-related factors. First, the thyroid gland is characterized by a rich blood supply, which may inhibit cancer cell colonization. Second, high oxygenation and high iodine content inhibit tumor progression because malignant cells prefer anaerobic metabolism. Additionally, bloodborne metastases must bypass multiple vascular filters (liver, lungs) first [7].

Metastases to the thyroid are rare, but when they occur, renal cell carcinoma is the most common, followed by lung, breast, and melanoma. These metastases are typically via the bloodstream and may present years after primary cancer treatment [8]. According to Smith et al., in a cohort of 36 thyroid metastases, 48% were RCC, 15% lung, 11% breast, 8% colorectal [9]. In another study, among 3,957 patients with thyroid cancer, 56 had thyroid metastases. Lung cancer was the most common source, followed by malignancies of the head/neck, kidney, breast, cervix, and gastrointestinal tract [10].

Metastasis of ovarian carcinoma to the thyroid gland is very uncommon, with only four cases described in the literature. In their report, Skarf et al. describe recurrent ovarian papillary adenocarcinoma that developed bilateral thyroid metastases, which led to clinical hypothyroidism with elevated TSH. The metastatic disease was confirmed with FNA biopsy [3]. Vaslamatzis MM, et al. report a solitary thyroid metastasis from high-grade serous ovarian carcinoma. Biopsy confirmed diagnosis, and the patient achieved complete remission following thyroidectomy and chemotherapy [4]. Ji X, et al. confirmed metastatic clear cell ovarian carcinoma in the thyroid using FNA biopsy and immunocytochemistry [5]. Sasaki R, et al. revealed thyroid metastasis in a 56-year-old with advanced ovarian clear cell carcinoma performing core-needle biopsy and immunocytochemistry [6]. In our case, thyroid metastases were found 5 years after the ovarian surgery and chemotherapy. We diagnosed the patient with thyroid metastasis from ovarian carcinoma using imaging tests, FNA biopsy and elevated CA125 levels.

Diagnosis of thyroid nodules depends mainly on ultrasound or contrast-enhanced CT. Fine-needle aspiration cytology should be performed for accurate diagnosis [8, 11]. This can help differentiate benign and malignant lesions. The patient's history is very important and can indicate metastatic disease. In our case, Tg levels in the fluid obtained from the FNA biopsy of the lymph node helped confirm a metastatic lesion [12]. Also, CA125 levels were elevated - we have a specific tumor marker that is associated with ovarian cancer [13]. Some authors suggest performing core-needle biopsy or immunohistochemistry (IHC) in controversial cases [14]. The most frequently used IHC markers are TTF-1, caudal-type homeobox-2, cytokeratin (CK) 7, and CK20 [15, 16]. Primary thyroid carcinomas are positive for TG, TTF-1, and galetin-3, whereas metastatic lesions are negative [17, 18]. The accuracy of thyroid imaging has improved in the era of positron emission tomography (PET scanning). However, sometimes even advanced techniques cannot reliably differentiate primary thyroid lesions from metastases [19]. Therefore, a multidisciplinary team must have a high index of suspicion, especially in patients with a history of malignancy.

Surgery may be considered for metastatic thyroid tumors. Most patients with metastasis to the thyroid had poor outcomes. The aim of surgery is to relieve compressive symptoms in patients with disseminated disease [20]. In this case, together with the thyroid metastasis, multiple nodal metastases were detected. Therefore, a multidisciplinary team accepted that thyroid metastases occurred as a result of progression of the primary disease and require specific treatment. The patient was sent to the Department of Medical Oncology. According to the literature, the setting is complex, but for patients with widespread metastases in the setting of an aggressive malignancy, surgery is rarely indicated [20].

CONCLUSION

We described a case of a patient with thyroid metastasis from ovarian serous papillary carcinoma. Using ultrasound-guided FNA, serum CA 125 and CT scan, we were able to accurately diagnose thyroid metastasis of ovarian carcinoma. Distant metastases to the thyroid gland are rare and mostly occur in the advanced stages of the primary malignant disease.

REFERENCES:

1. Mirallié E, Rigaud J, Mathonnet M, Gibelin H, Regenet N, Hamy A, et al. Management and prognosis of metastases to the thyroid gland. *J Am Coll Surg*. 2005 Feb;200(2):203-7. [PubMed]

2. 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 Aug;38(4):338-42. [PubMed]

3. Skarf LM, Dezube BJ, Bryan B, Berkenblit A. Ovarian carcinoma with thyroid metastases causing clinical hypothyroidism: a case report. *Gynecol Oncol*. 2006 Aug;102(2):394-6. [PubMed]

4. Vaslamatzis MM, Stathopoulos CH, Tegos TK, Kyriakopoulos G, Alevizopoulos N, Vasili E, et al. Solitary thyroid metastasis from a high-grade serous ovarian epithelial carcinoma. *Endocrinol Metab Int J*. 2018. 6:387–389. [Crossref]

5. Ji X, Zhang J, Liu Y, Wu J, Du Y. Fine needle aspiration diagnosed a rare case of ovarian clear cell carcinoma metastasis to thyroid gland. *Cytopathology*. 2021 32:538–540. [Crossref]

6. Sasaki R, Yamazaki H, Kumagai E, Toda S, Saito A. Thyroid metastasis from ovarian clear cell carcinoma. *Endocrinol Diabetes Metab Case Rep*. 2024 Dec 19;2024(4):e240086. [PubMed]

7. Willis RA. Metastatic Tumours in the Thyreoid Gland. *Am J Pathol*. 1931 May;7(3):187-208.3. [PubMed]

8. Nguyen M, He G, Lam AK. An update on the current epidemiological status of metastatic neoplasms to the thyroid. *Cancer Epidemiol*. 2022 Aug;79:102192. [PubMed]

9. Smith-Bindman R, Lebda P, Feldstein VA, Sellami D, Goldstein RB, Brasic N, et al. Risk of thyroid cancer based on thyroid ultrasound imaging characteristics: results of a population-based study. *JAMA Intern*

Med. 2013 Oct 28;173(19):1788-96. [PubMed]
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 Mar; 26(1):80-6. [PubMed]
11. Kim TY, Kim WB, Gong G, Hong SJ, Shong YK. Metastasis to the thyroid diagnosed by fine-needle aspiration biopsy. *Clin Endocrinol (Oxf)*. 2005 Feb;62(2):236-41. [PubMed]
12. Kargun S, Aydemir M, Yilmaz N, Ozdem S, Sari R. Diagnostic value of thyroglobulin washout in fine-needle aspiration samples for diagnosis and follow-up of differentiated thyroid cancer. *Medicine (Baltimore)*. 2023 Dec 8;102(49):e36426. [PubMed]
13. Momenimovahed Z, Mazidimoradi A, Allahqoli L, Salehiniya H. The Role of CA-125 in the Management of Ovarian Cancer: A Systematic Review. *Cancer Rep (Hoboken)*. 2025 Mar;8(3):e70142. [PubMed]
14. Choi SH, Baek JH, Ha EJ, Choi YJ, Song DE, Kim JK, et al. Diagnosis of Metastasis to the Thyroid Gland: Comparison of Core-Needle Biopsy and Fine-Needle Aspiration. *Otolaryngol Head Neck Surg*. 2016 Apr;154(4):618-25. [PubMed]
15. Papi G, Fadda G, Corsello SM, Corrado S, Rossi ED, Radighieri E, et al. Metastases to the thyroid gland: prevalence, clinicopathological aspects and prognosis: a 10-year experience. *Clin Endocrinol.* 2007; 66(4): 565–571. [Crossref]
16. Bayrak R, Haltas H, Yenidunya S. The value of CDX2 and cytokeratins 7 and 20 expression in differentiating colorectal adenocarcinomas from extraintestinal gastrointestinal adenocarcinomas: cytokeratin 7-/20+ phenotype is more specific than CDX2 antibody. *Diagn Pathol.* 2012;7:9. [Crossref]
17. Ordonez NG. Value of thyroid transcription factor-1 immunostaining in distinguishing small cell lung carcinomas from other small cell carcinomas. *Am J Surg Pathol*. 2000; 24(9): 1217–1223.
18. Bartolazzi A, Gasbarri A, Papotti M, Bussolati G, Lucante T, Khan A, et al. Application of an immunodiagnostic method for improving preoperative diagnosis of nodular thyroid lesions. *Lancet.* 2001; 357(9269):1644–1650. [Crossref]
19. Nakhjavani MK, Gharib H, Goellner JR, van Heerden JA. Metastasis to the thyroid gland. A report of 43 cases. *Cancer.* 1997;79:574–8.
20. Tang Q, Wang Z. Metastases to the Thyroid Gland: What Can We Do? *Cancers (Basel)*. 2022 Jun 19;14(12):3017. [PubMed]

Please cite this article as: Malinova D, Dimitrova R, Siderova M, Chaushev B. Thyroid metastases from ovarian serous carcinoma: a rare case report. *J of IMAB.* 2025 Jul-Sep;31(3):6447-6451.
[Crossref - https://doi.org/10.5272/jimab.2025313.6447]

Received: 04/03/2025; Published online: 10/09/2025

Address for correspondence:
Doroteya Malinova, MD,
Department of General and Clinical Pathology, Forensic Medicine and Deontology, Faculty of Medicine, Medical University - Varna,
Clinic of General and Clinical Pathology, University Hospital St. Marina, Varna,
1, Hr. Smirnenski Blvd., 9010 Varna, Bulgaria
E-mail: dmalinova@gmail.com