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Breast and Axillary Lymph Node Metastasis from Ovarian Cancer: A Case Report

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Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

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Conflict of interest: None declared

Patient: Female, 70-year-old
Final Diagnosis: Breast cancer • ovarian cancer
Symptoms: Anorexia • dyspnea
Medication: —
Clinical Procedure: —
Specialty: Oncology

Objective: Rare disease

Background: Breast metastasis (BM) is extremely rare. Ovarian cancer accounts for approximately 0.03% to 0.6% of all BMs. BM diagnosis is challenging and the prognosis very poor. The treatment is multidisciplinary and strictly related to multiple clinical and biological factors.

Case Report: A 70-year-old non-smoking Caucasian woman was hospitalized for a 4-month history of abdominal pain, anorexia, and weight loss of 10 kg. During the clinical examination, we found multiple axillary lymph nodes and a painless tumor lesion in the superior internal quadrant of the right breast. Whole body CT-scan and ^{18}F-fluorodeoxyglucose PET scan documented a right ovarian tumor associated with multiple metastases, a hypermetabolic lesion of the right breast, and multiple axillary lymphadenopathies that were confirmed by breast ultrasonography. The percutaneous biopsy of both the right axillary lymph node and breast tumor showed a metastasis from a high-grade serous papillary ovarian adenocarcinoma. Considering the tumor aggressiveness and the lack of *BRCA1* and *BRCA2* mutations, we started systemic chemotherapy with a 3-week carboplatin/paclitaxel regimen combined with bevacizumab, which quickly improved the patient's symptoms and induced a biological tumor response.

Conclusions: This case reports a synchronous breast metastasis from an ovarian cancer and highlights this uncommon entity, which is very difficult to diagnose and treat. A differential diagnosis from a primary breast cancer should be considered as the treatment and prognosis of these 2 tumors are different.

MeSH Keywords: Breast • Lymphatic Metastasis • Ovarian Neoplasms

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/925089

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Background

Breast metastasis (BM) is extremely rare [1]. Several clinical and autopsy retrospective studies have reported a BM frequency of 0.5% to 6.6%, respectively [1–8]. Ovarian cancer accounts for approximately 0.03% to 0.6% of all BM cases [2]. BM diagnosis is challenging and requires radiological and pathological investigations, and its treatment is multidisciplinary and closely related to multiple clinical and biological factors [4–8]. The prognosis of BM is poor with a reported overall survival <2 years [6–8]. Herein, we describe a case of a metastatic ovarian serous papillary adenocarcinoma presenting with synchronous breast and axillary lymph node metastases in a context of a multiple metastatic dissemination.

Case Report

A 70-year-old non-smoking Caucasian woman was hospitalized for a 4-month-long history of abdominal pain, anorexia, and weight loss of 10 kg. She had concomitant arterial hypertension, hypothyroidism, and chronic obstructive pulmonary disease. She regularly took indapamide and levothyroxine. During the physical examination, we found multiple hard, irregular bilateral axillary lymph nodes, a painless tumor lesion of 1 cm in the superior internal quadrant of the right breast, a bilateral pleural effusion, and a moderate ascites. All biological tests were normal, but tumor marker analysis showed high levels of CA 15.3 (222 ng/ml) and CA 125 (1893 ng/ml). Whole body CT-scan showed a right tumor ovarian lesion, multiple lymph node metastases, hepatic and splenic metastases, a bilateral pleural effusion with a complete atelectasis of the right lung, a diffuse ascites, and a nonspecific nodular lesion of the right breast (Figure 1A, red circle). In addition to the other metastases and the primary ovarian tumor, the ^{18}F-fluorodeoxyglucose (FDG)-PET scan confirmed the presence of a hypermetabolic tumor lesion of the right breast (Figure 1B, red circle). Mammography did not reveal any glandular architectural distortion or microcalcification, but breast ultrasonography demonstrated a well-circumscribed nodular lesion (Figure 1C, red arrow) associated with multiple axillary lymphadenopathies.

The patient underwent aspiration of the ascitic fluid. Cytology revealed clusters of tumor cells exhibiting cytoplasmic vacuoles and papillary and acinar structures consistent with the diagnosis of a high-grade serous papillary ovarian adenocarcinoma. The patient also had a percutaneous ultrasound-guided core biopsy of both the right axillary lymph node and breast tumor. Histology documented a diffuse tumor infiltration with papillary structures and necrosis (Figure 1D). The immunohistochemistry showed the tumor cells were positive for CK7, WT1, PAX8, and estrogen and progesterone receptors, and negative for mammaglobin and GATA-3 (Figure 1E), according to the diagnosis of a metastasis from a high-grade serous papillary ovarian adenocarcinoma. The tumor cells harbored a *TP53* but not a *BRCA1* or *BRCA2* mutation.

Considering the tumor aggressiveness and the lack of *BRCA1* and *BRCA2* mutations, we started a standard systemic chemotherapy with a 3-week carboplatin (AUC: 5)/paclitaxel (175 mg/mq) regimen combined with bevacizumab (15 mg/kg). To date, we have administered 5 cycles of chemotherapy, which were well tolerated. The patient also received a right talc pleurodesis for persistant dyspnea.

After the first 2 cycles of treatment, the patient's symptoms improved and a tumor biological response was observed as confirmed by the decreasing levels of CA 15.3 (33 ng/ml) and CA 125 (150 ng/ml). We did not perform a tumor radiological evaluation because of the current COVID-19 pandemic, but a ^{18}F-FDG PET scan is scheduled in June 2020.

Discussion

BMs are more frequent in women (92.2%), in the left breast (46%), and in the superior internal quadrant [1–8]. A bilateral involvement is described in only 13.7% of cases [4–8]. Most primary tumors associated with BMs include lung, gynaecological, gastrointestinal, melanoma, and hematological cancers [1–8]. The mean age at diagnosis is about 50 years (range 32–87) [1–8].

Breast ovarian metastases (BOM) account for about 0.03% to 0.6% of all BMs [2]. In a recent study, the incidence of BMs from primary gynecologic and ovarian cancer was reported in 0.17% and 0.07% of patients, respectively, with a diagnostic interval of 2 years after the initial diagnosis of the primary cancer [4].

BOM is usually associated with the serous papillary adenocarcinoma subtype, an aggressive and advanced disease, and a poor prognosis [9–19].As BMs usually develop out of the mammary ductal system, they clinically present as round, rapid growing, painless, and mobile lesions without any cutaneous alteration [4–8].Radiologically, BMs typically appear as regular lesions without skin infiltration or peri-tumoral desmoplastic reaction [4–8]. Microcalcifications are rare and usually associated with *psammoma* bodies in ovarian cancer patients [4–9]. On ultrasonography, BMs have a regular shape and a hypoechogenic aspect with indistinct margins and a posterior enhancement, in the absence of any spiculations, calcifications, or architectural distortion [4–8]. Recently, a study confirmed that the majority of BMs presented as a solitary nodule with a fibrous pseudocapsule and the lack of any *in situ* carcinoma component. The prognosis was poor with a median overall survival of 15 months [1]. In another small case series, serous

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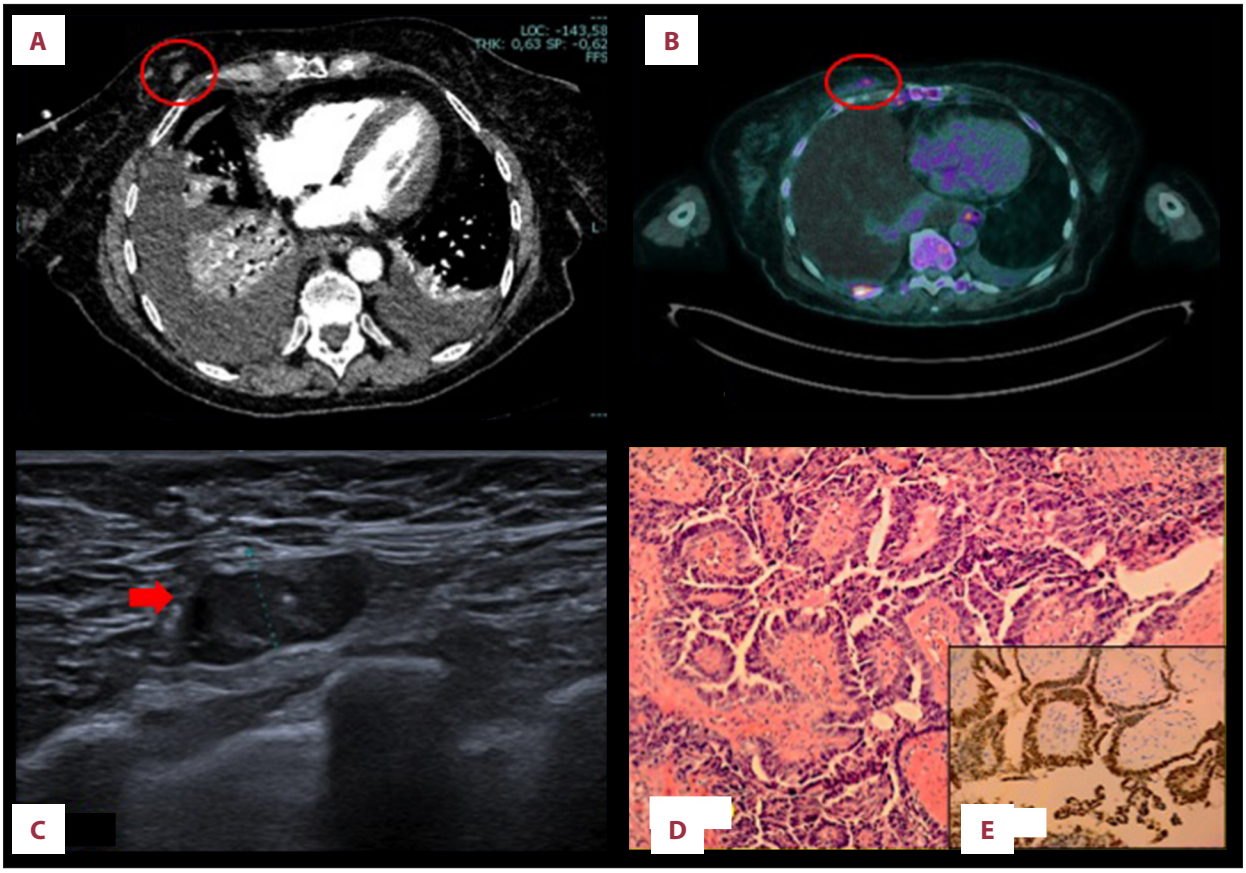

Figure 1. (**A**) Tumor lesion of the right breast (CT-scan; red circle). (**B**) Hypermetabolic tumor lesion of the right breast (PET scan; red circle). (**C**) Well-circumscribed, nodular, hypoechogenic breast lesion (Ultrasound; red arrow). (**D**) Massive infiltration of tumor cells with papillary structures and necrosis (histology; hematoxylin and eosin stain, 100×). (**E**) Diffuse and strong nuclear staining ofPAX 8 in tumor cells (immunohistochemistry; 200×).

papillary carcinoma was the most common histological type. Multiple BOMs were described in 4 patients, and only 6 patients showed concomitant axillary lymph node metastases [5].

However, as BMs show variable radiologic and clinical features, a biopsy is often required for a differential and accurate diagnosis [4–8].

The histology report typically shows a peri-ductal and -lobular location, a subcutaneous tissue infiltration, the absence of any *in situ* component, desmoplastic reaction, and elastosis [2–8].

The management is complex and multidisciplinary and should take into account multiple factors, such as the patient's performance status and comorbidities, the presence of a concomitant extra-mammary tumor involvement, the time of the tumor recurrence, and the activity of the previous treatments [4–8]. As BOMs are usually associated with a concomitant extra-mammary metastatic dissemination, surgery is often indicated only for symptom palliation or in patients with an isolated methachronous lesion and a long interval from the primary tumor diagnosis [4–8]. Instead, chemotherapy represents the main treatment with contrasting results [5–8].

As compared to many other case reports described in the literature, our patient presented with synchronous axillary lymph node and breast metastases. This is very uncommon as BOM is usually found 1 to 2 years after the primary ovarian tumor diagnosis and is often associated with concomitant extra-mammary metastases. In our case, the diagnosis of this rare entity was made during the radiological staging of the primary ovarian cancer. In addition to a standard whole-body CT-scan, we performed a ^{18}F-FDG PET scan for better tumor staging before any cyto-reduction surgery. The radiological tests and clinical examination enabled us to diagnose these rare metastases.

As described in several studies and case reports, the BOM prognosis is poor with a reported median overall survival <2 years, attesting to the biological and clinical aggressiveness of these metastases. In contrast with the literature data, our patient presented a good clinical and biological response to a standard chemotherapy ofby a 3-week carboplatin/paclitaxel

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regimen with bevacizumab. We did not perform radiological tests confirming these data because of the current COVID-19 pandemic, but a ^{18}F-FDG PET scan is scheduled in June 2020.

Conclusions

In our case, we report a patient presenting with a high-grade serous papillary ovarian adenocarcinoma with synchronous breast and axillary lymph node metastases in the context of a very aggressive and advanced disease. In order to exclude a concomitant primary breast tumor, a percutaneous biopsy of both these lesions was performed. Considering the lack of tumor *BRCA1* and *BRCA2* mutations, standard chemotherapy of a 3-week carboplatin/paclitaxel regimen combined with bevacizumab was administered. This treatment was well tolerated and quickly improved the patient's symptoms and induced an important biological tumor response.

This case highlights the rare entity, BOM, which is very difficult to diagnose and should be considered in all patients with a history of ovarian cancer. A differential diagnosis from a primary breast cancer is crucial as the treatment and prognosis of these 2 tumors are different.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on raisonable request. All data and materials are available for review at the Division of Medical Oncology, CHR Metz-Thionville, in an electronic format.

Conflict of interests

None.

References:

1. DeLair DF, Corben AD, Catalano JP et al: Non-mammary metastases to the breast and axilla: A study of 85 cases. Mod Pathol, 2013; 26: 343–49
2. Surov A, Fiedler E, Holzhausen HJ et al: Metastases to the breast from non-mammary malignancies: Primary tumors, prevalence, clinical signs, and radiological features. Acad Radiol, 2011; 18: 565–74
3. Lee AHS: The histological diagnosis of metastases to the breast from extramammary malignancies. J Clin Pathol, 2007; 60: 1333–41
4. Hajdu SI, Urban JA: Cancers metastatic to the breast. Cancer, 2015; 29: 1691–96
5. Moore D, Wilson D, Hurteau J et al: Gynecologic cancers metastatic to the breast. J Am Coll Surg, 1998; 187: 178–81
6. Zhou Y, Li Z, Liu H et al: One case of metastatic disease of breast of ovarian cancer. Heilongjiang Med, 2012; 35: 102
7. Lee SK, Kim WW, Kim SH et al: Characteristics of metastasis in the breast from extramammary malignancies. J Surg Oncol, 2010; 101: 137–40
8. Longo R, Melgar E, Campitiello M et al: Breast metastasis from squamous cell carcinoma of the oropharynx: A case report. J Med Case Rep, 2017; 11: 355–59
9. Antuono L, Angela F, Luca N et al: Breast metastasis from ovarian cancer: A case report. Radiol Case Rep, 2018; 13: 1166–69
10. Della Corte L, Giampaolino P, Fabozzi A et al: Breast metastasis two years after pelvic surgery and adjuvant chemotherapy for serous ovarian cancer. Gynecol Endocrinol, 2019; 35: 211–13
11. Karam AK, Stempel M, Barakat RR et al: Patients with a history of epithelial ovarian cancer presenting with a breast and/or axillary mass. Gynecol Oncol, 2009; 112: 490–95
12. Recine MA, Deavers MT, Middleton LP et al: Serous carcinoma of the ovary and peritoneum with metastases to the breast and axillary lymph nodes: A potential pitfall. Am J Surg Pathol, 2004; 28: 1646–51
13. Schneuber SE, Scholz HS, Regitnig P et al: Breast metastasis 56 months before the diagnosis of primary ovarian cancer: a case study. Anticancer Res, 2008; 28: 3047–50
14. Tempfer CB, El Fizazi N, Ergonenc H, Solass W: Metastasis of ovarian cancer to the breast: A report of two cases and a review of the literature. Oncol Lett, 2016; 11: 4008–12
15. Klein RL, Brown AR, Gomezcastro CM et al: Ovarian cancer metastatic to the breast presenting as inflammatory breast cancer: A case report and literature review. J Cancer, 2010; 1: 27–31
16. Loredo DS, Powell JL, Reed WP et al: Ovarian carcinoma metastatic to breast: A case report and review of the literature. Gynecol Oncol, 1990; 37: 432–36
17. Wadhwa J, Dawar R, Kumar L: Ovarian carcinoma metastatic to the breast. Clin Oncol, 1999; 11: 419–21
18. Wang Z, Zhao D, Liu R, Zheng B: Ovarian cancer metastasis to the breast 18 years after the initial diagnosis. Medicine, 2019; 98: 43–45
19. Hamdy O, Shokeir FA, Saleh GA, Zaki MMA: Intramammary Nodal metastasis from ovarian cancer: A case report. Eur J Breast Health, 2019; 15(3): 191–95

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