Ref: Ro Med J. 2022;69(Suppl4)
DOI: 10.37897/RMJ.2022.S4.3

Breast metastases from ovarian cancer

Nicolae Bacalbasa[1,2], Irina Balescu[3], Claudia Stoica[4,5], Cristina Martac[6], Valentin Varlas[1,7], Andrei Voichitoiu[1,8], Lucian Pop[1,8], Sorin Petrea[9], Mihaela Vilcu[9,10], Iulian Brezean[9,10]

[1]Department of Obstetrics and Gynecology, "Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania
[2]Department of Visceral Surgery, Center of Excellence in Translational Medicine, Fundeni Clinical Institute, Bucharest, Romania
[3]Department of Visceral Surgery, Ponderas Academic Hospital, Bucharest, Romania
[4]Department of Anatomy, "Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania
[5]Department of Surgery, Ilfov County Emergency Hospital, Bucharest, Romania
[6]Department of Anesthesiology, Fundeni Clinical Institute, Bucharest, Romania
[7]Department of Obstetrics and Gynecology, Filantropia Clinical Hospital, Bucharest, Romania
[8]Department of Obstetrics and Gynecology, "Alessandrescu-Rusescu" National Institute of Mother and Child Care, Bucharest, Romania
[9]Department of Surgery, "Dr. I. Cantacuzino" Clinical Hospital, Bucharest, Romania
[10]Department of Surgery, "Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania

ABSTRACT

Ovarian cancer represents one of the most aggressive malignancies which is characterized by a high capacity of spread via multiple pathways such as lymphatic, peritoneal and hematogenous route, the most commonly encountered sites for metastatic lesions being represented by lung, liver, peritoneum and lymph nodes. In extremely rare cases breast metastases with ovarian origin have been reported. In such cases different therapeutic strategies have been proposed; however the overall prognosis remains extremely poor, the presence of metastatic lesions at this level being usually the sign of disseminated disease.

Keywords: breast metastases, ovarian cancer, spread

INTRODUCTION

Although nowadays we are in an era in which prevention and screening tests represent one of the most important desiderates especially when it comes to cancer, unfortunately in the field of ovarian cancer things are far to be considered as well controlled due to the fact that no screening tests are available for the moment [1]. Therefore, up to two thirds of patients are diagnosed in advanced stages of the disease, when disseminated lesions are present [2]; in such cases debulking surgery to no residual disease is needed in order to achieve a good control of the disease. Even though, certain cases will develop recurrent disease via multiple pathways, the most commonly incriminated ones being represented by the hematogenous, lymphatic and peritoneal route.

PATHOGENESIS OF BREAST METASTASES FROM OVARIAN CANCER

Breast metastases from ovarian cancer are an extremely rare event, being estimated that they represent less than 0,03% of all breast neoplasms [3]. This entity was initially reported in 1907 and since than less than 50 cases have been reported [4].

They usually develop via hematogenous spread and are the sign of systemic neoplastic impregnation; meanwhile, metastases at the level of the axillary lymph nodes might be encountered via lymphatic spread, making therefore a differential diagnostic with primary breast cancer even more difficult (Figure 1). In order to differentiate between an ovarian metastasis at the level of the breast and a primary breast cancer, immunohistochemical markers such as GATA3 and PAX8 should be analyses; therefore, the presence of GATA3 at the level of the breast tumor

Corresponding author:
Nicolae Bacalbasa
E-mail: nicolae_bacalbasa@yahoo.ro

Article History:
Received: 18 April 2022
Accepted: 30 April 2022

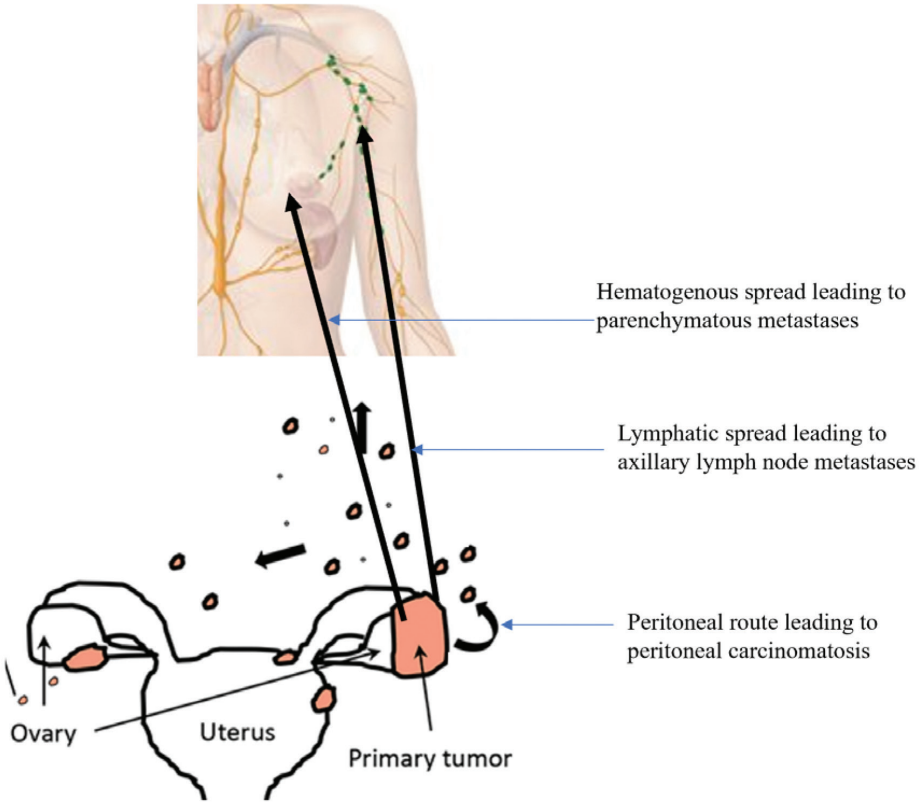

FIGURE 1. Patterns of spread of ovarian cancer leading to the apparition of breast and axillary metastases

should indicate the presence of a primary breast cancer while the presence of PAX8 should orientate the diagnostic to a metastatic disease from other gynecological primaries [5,6]. Interestingly, parenchymatous breast metastases from ovarian cancer can also develop via lymphatic route; therefore, it is believed that malignant cells from the lymphatic flow will reach the thoracic duct, left supraclavicular nodes and, furthermore they reach the left breast [7]. When it comes to the most commonly encountered histopathological subtypes of ovarian cancer leading to the apparition of breast metastases, it seems that up to 75% of cases are represented by serous papillary carcinoma and they usually develop within the first two years from the initial diagnostic [8].

CLINICAL AND IMAGISTIC SIGNS

As for the clinical presentation, most often patients with breast metastases from ovarian cancer present solitary masses (in up to 95% of cases) usually located at the level of the upper external quadrants (in up to 60% of cases) [9,10]. When it comes to the time of presentation, most cases are diagnosed after an average interval of two years after the initial diagnostic of ovarian cancer [11]. Most commonly, patients with metastatic lesions at the level of the breast present local signs of inflammation such as erythema, lymphedema, swelling and pain therefore mimicking the presence of inflammatory breast cancer [12].

Interestingly, the imagistic studies such as mammography usually describe breast metastases from ovarian cancer as round, well delimited masses with regular margins while the ultrasound describes these lesions as hypo-echoic masses with posterior acoustic enhancement [13]. Another interesting aspect which should be underlined is the one of microcalcifications; therefore, while primary breast cancer usually presents microcalcifications on mammography, metastatic lesions with ovarian origin present such calcifications only in the case of ovarian papillary carcinoma with psammoma bodies [14,15].

As expected, laboratory tests such as determining the serum levels of CA125 and CA15-3 do not present significant influence due to the fact that increased values are found in both ovarian and breast primaries.

THERAPEUTIC STRATEGIES IN BREAST METASTASES FROM OVARIAN CANCER

Due to the fact that breast metastases from ovarian cancer are usually considered as the sign of a systemic neoplastic impregnation, the most commonly approved therapeutic strategy is represented by systemic chemotherapy while local therapies such as resection or radiation therapy should be reserved for palliative purposes [11]. However, due to the fact that most often usually develop in patients with history of heavily pretreated ovarian cancer, the chances to have a favorable response and to achieve a long term survival are scarce [16].

ESTIMATED SURVIVAL IN PATIENTS WITH BREAST METASTASES FROM OVARIAN CANCER

As expected, cases diagnosed with this pathology have a very poor prognosis, the estimated survival ranging between days and months; however, in isolated cases long term survival (reaching two- three years and a half) have been reported [17].

CONCLUSIONS

The presence of breast metastases from ovarian cancer represents a very rare event and should be considered as the sign of neoplastic impregnation. In order to establish the metastatic origin of the lesion, immunohistochemical staining is necessary. Whenever the final diagnostic is the one of a distant metastasis the patient should be further submitted to systemic chemotherapy, local therapies such as resection or irradiation being reserved only for palliative purposes.

Conflict of interest: none declared
Financial support: none declared

REFERENCES

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL et al. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2018;68(6): 394–424.
2. Heintz AP, Odicino F, Maisonneuve P et al. Carcinoma of the ovary. FIGO 26th Annual Report on the Results of Treatment in Gynecological Cancer. *Int J Gynaecol Obstet.* 2006;95(Suppl1):S161–192.
3. 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(12):1646–1651.
4. Klein RL, Brown AR, Gomez-castro 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.
5. Hockstein S, Keh P, Lurain JR, Fishman DA. Ovarian carcinoma initially presenting as metastatic axillary lymphadenopathy. *Gynecol Oncol.* 1996;65:543–547.
6. Sangoi AR, Shrestha B, Yang G et al. The novel marker GATA 3 is significantly more sensitive than traditional markers mammaglobin and GCDFP15 for identifying breast cancer in surgical and cytology specimens of metastatic and matched primary tumors. *Appl Immunohistochem Mol Morphol.* 2016;24(4):229-237.
7. Lee AH. The histological diagnosis of metastases to the breast from extramammary malignancies. *J Clin Pathol.* 2007;60(12):1333–1341.
8. Antuono L, Angela F, Luca N et al. Breast metastasis from ovarian cancer: A case report. *Radiol Case Rep.* 2018;13(6):1166–9.
9. Fulciniti F, Losito S, Botti G et al. Metastases to the breast: role of fine needle cytology samples. Our experience with nine cases in 2 years. *Ann Oncol.* 2008;19(4):682–687.
10. Moore DH, Wilson DK, Hurteau JA et al. Gynecologic cancers metastatic to the breast. *J Am Coll Surg.* 1998;187(2):178–181.
11. Micha JP, Goldstein BH, Epstein HD et al. Ovarian cancer metastatic to the breast. *Gynecol Oncol.* 2006;102(2):386–390.
12. Ferrari F, Ficarelli S, Forte S et al. Extra-abdominal ovarian cancer presenting with breast metastases at diagnosis: Case report and literature review. *European Journal of Obstetrics & Gynecology and Reproductive Biology.* 2020;255:211–221.
13. Sippo DA, Kulkarni K, Di CP et al. Metastatic disease to the breast from extramammary malignancies: a multimodality pictorial review. *Curr Probl Diagn Radiol.* 2016;45:225–232.
14. Vizcaíno I, Torregrosa A, Higueras V et al. Metastasis to the breast from extramammary malignancies: a report of four cases and a review of literature. *Eur Radiol.* 2001;11:1659–1665.
15. Lee SH, Park JM, Kook SH et al. Metastatic tumors to the breast: mammographic and ultrasonographic findings. *J Ultrasound Med.* 2000; 19:257–262.
16. Hasiakos D, Papakonstantinou K, Goula K et al. Juvenile granulosa cell tumor associated with pregnancy: report of a case and review of the literature. *Gynecol Oncol.* 2006;100:426–429.
17. Ozgüroğlu M, Ersavaşti G, Ilvan S et al. Bilateral inflammatory breast metastases of epithelial ovarian cancer. *Am J Clin Oncol.* 1999;22(4):408–10.