MEDICO RESEARCH CHRONICLES
ISSN NO. 2394-3971
DOI No. 10.26838/MEDRECH.2020.7.1.555
Contents available at: www.medrech.com

SYNCHRONOUS OVARIAN DYSGERMINOMA AND METASTATIC BREAST CARCINOMA: A CASE REPORT

Aqueel M[1], Raza MW[2*], Singh PK[3], Prasad SN[4], Mishra MP[5]
1. Junior resident JK Cancer Institute Kanpur.
2. Assistant Professor, Room No. 13, J K Cancer Institute, Kanpur.
3. Assistant Professor, J K Cancer Institute, Kanpur.
4. Professor & Head of Department Radiotherapy JK Cancer Institute, Kanpur.
5. Director, Pathology and Director, JK Cancer Institute, Kanpur.

ARTICLE INFO

Article History
Received: December 2019
Accepted: January 2020
Keywords:
dysgerminoma, infiltrating, breast, dual, BRCA

Corresponding author*
Dr. Raza M. W.
J. K. Cancer Institute
Kanpur

ABSTRACT

CASE REPORT

Introduction: Synchronous dual malignancies are rare findings. A unique case report of first of its kind of synchronous ovarian dysgerminoma and metastatic infiltrating duct carcinoma of the breast is being reported. **Presentation of Case**: A young female investigated for pain abdomen was found to have right ovarian mass was operated outside which was histopathologically proven to be dysgerminoma presented to our clinics with complaints of a bilateral breast lump, dry cough and pain abdomen. She had a raised beta HCG and LDH. She was investigated and diagnosed as a case of metastatic breast carcinoma with ovarian dysgerminoma. **Discussion**: Patients with germline BRCA mutations have been shown to present with such aggressive dual malignancy of breast and ovary. She survived only for two to three months after her initial presentation. **Conclusion**: Such patients need to be screened and detected early so that aggressive treatment could be started and survival could be increased.

INTRODUCTION:

Synchronous malignancies are defined as second tumors which have been occurring either simultaneously, or within 6 months after the first malignancy while metachronous malignancies are secondary tumors that have developed after 6 months, or even more than that from the first malignancy (1) Compared to breast cancer, with a 30% incidence among females and a 15% mortality rate (2), ovarian cancer presents a lower incidence, of approximately 3%, but continues to represent an important cause for morbidity and mortality, usually both of them being diagnosed in advanced stages (3,4).

Dysgerminoma is the ovarian counterpart to testicular seminoma. It is the most common Ovarian malignant germ cell tumor (OMGCT), accounting for 1%–2% of primary ovarian neoplasms and 32.8%–37.5%

of all OMGCTs (5,6,7). According to a survey performed in the United States comprising 1262 cases of OMGCTs registered from 1973 to 2002, the age-adjusted incidence of ovarian dysgerminoma per 100,000 women-years was 0.109 (5). Most cases occur in adolescence and early adulthood, although it may occur at any age, with reported cases ranging from 7 months to 70 years old (6)

One in eight American women develops breast cancer during their lifetime [8]. According to 2019 cancer statistics, breast cancer accounts for about 30% of all new cancer cases [8]. While breast cancer mortality rates have considerably decreased over the past years, incidence rates have increased by 0.4% per year between 2006 and 2015 [8]. However, breast cancer five-year relative survival rates were amongst the highest (90%) of all cancer types diagnosed between 2008 and 2014 [8]. This is the result of a reduction in smoking and reflects progress in the detection of early-stage breast cancer [8]. Although the recognition and treatment of breast cancer metastases to sites such as bone, liver, lungs, and brain are well-documented, breast cancer spread to peritoneal surfaces is a poorly defined entity. Breast cancer carcinomatosis is a rare clinical presentation that usually occurs during a progression event or can be detected on initial diagnosis in some cases (9-10).

Synchronous presence of two primary tumors, located at both breast and ovary, in a patient younger than 60 years old is rare and associated with an approximately 30% risk of presenting mutations of the BRCA1 and BRCA2 genes (Breast Cancer 1/2 Gene) (11).

CASE REPORT

A 24 yr old female presented to our clinics with complaints of the lump in the bilateral breast and dry cough from 20 days. She had a history of right ovarocystectomy for pain lower abdomen one month back which was histopathologically proven to be dysgerminoma.

The patient was examined and found to have two lumps in the right breast and one lump in the left breast. She had bilateral axillary lymphadenopathy and 3.5 X 2.5cm firm, fixed, nontender right supraclavicular lymph node.

Her contrast CT thorax showed extensive mediastinal lymphadenopathy in paratracheal prevascular subcarinal right hilar regions, nodular opacity in the upper lobe of the right lung, bilateral axillary lymphadenopathy and right cervical level four lymphadenopathy.

Contrast CT scan whole abdomen and pelvis showed 4.2 x 2.7cm well-defined lesion in the right adrenal gland. The first differential diagnosis was that of metastatic dysgerminoma or lymphoma or Koch's disease.

Fine Needle aspiration cytology (FNAC) from right supraclavicular swelling showed metastatic adenocarcinoma and FNAC from the right & left breast confirmed infiltrating ductal carcinoma. Tumor markers evaluated were serum LDH highly raised to the tune of 1733 u/l, serum alpha-fetoprotein was within normal levels 15.65 ng/ml and serum beta- HCG was 73.33 mIu/mL. genetic testing could not be performed due to financial constraints.

The patient was planned for weekly paclitaxel 80 mg/m^2 but the patient wanted to come for chemotherapy one week later due to her logistics. She reported in an emergency after one week with severe dyspnoea and weakness and died.

DISCUSSION

Dysgerminomas are the most common malignant germ-cell tumors of the ovary (12), though they account for only about 3 to 5% of all ovarian malignancies (13). Presently, 75% of dysgerminomas occur between the age of 10 and 30 (13) and 75% of these remain confined to the ovary at the time of diagnosis (13). Extraovarian tumor spread is mainly through lymphatics and often involve the retroperitoneal and pelvic lymph nodes (14). In

addition, the hematogenous spread may occur; common sites of involvement are the lungs, liver, and bones (12, 14). Few reports in the literature suggest renal metastasis. Seegar reviewed 89 cases of dysgerminoma and found such metastasis in only 3 cases (15). Mandeville reported metastasis in the left kidney upon autopsy of a 4-year-old girl who had bilateral dysgerminoma along with liver, adrenal, pancreas, lymph node, and bone marrow involvement (16).In this case, the first look gave an impression of metastatic dysgerminoma.

Immunohistochemistry (IHC) plays an important role in characterizing tumors. Dysgerminomas are immunoreactive for PLAP, CD117, Oct-3/4, and vimentin while possibly focally positive for cytokeratin and HCG. They usually do not express epithelial membrane antigen (EMA), S100 protein, CD45 antigen, or AFP (13,17). Positive neuron-specific enolase expression is closely related to advanced tumors while WT1 expression correlates with poorer differentiation of dysgerminoma (18).

A multivariate analysis identified high tumor grade, ILC, and locoregional involvement as predictors of peritoneal metastases (19). About 82% of patients with the peritoneal disease also had other metastatic sites involved (19). Patients having peritoneal metastases had the least overall survival. In a study by Flanagan et al. survival rate of patients with peritoneal metastases from extra-abdominal tumors, breast cancer was 40.8% (222/543) of primary tumors (20)

Overall survival from the diagnosis of metastases was 5.8 months in patients with peritoneal metastases as compared to 22.6 months in metastatic breast cancer patients with no peritoneal involvement (17). Patients with metachronous metastasis had significantly poorer survival than patients with synchronous metastases (20)

In our case patient had peritoneal, lung, axillary and adrenal metastases and had a survival of two to three months.

Mutations of the BRCA1 gene determine the development of cancer at a usually young age (21), tumors generally being detected in advanced stages (III/IV) (22, 23).In our case patient was young twenty-four years old and having advanced metastatic stage four disease. Among the histopathologic types of ovarian cancer associated more seldom with BRCA1 mutations, there is also a case of primary ovarian dysgerminoma mentioned (24).

In this case, the genetic mutation was not tested but the clinical picture demonstrated it to be BRCA mutated synchronous malignancy.

CONCLUSION

Diagnosing synchronous malignancy is a clinical challenge. Such cases should be definitely tested for germline mutations and priority should be given on early diagnosis and aggressive management.

REFERENCES:

1. Suzuki T, Takahashi H, Yao K, Inagi K, Nakayama M, Makoshi T, et al. Multiple primary malignancies in the head and neck: a clinical review of 121 patients. Acta Otolaryngol Suppl. 2002; (547):88- 92
2. Cojan TTS, Vidrighin CD, Ciobanu M, Pauni I, Teodorescu M, Mogos G, et al. Breast-conserving surgery in breast cancer. Chirurgia (Bucur). 2012;107(5):616-25.
3. Siegel R, Ward E, Brawley O, Jemal A. Cancer statistics, 2011: the impact of eliminating socioeconomic and racial disparities on premature cancer deaths. CA Cancer J Clin. 2011;61(4): 212-36.
4. Bordea C, Plesca M, Condrea I, Gherghe M, Gociman A, Blidaru A. Occult breast lesion localization and concomitant sentinel lymph node biopsy in early breast cancer (SNOLL). Chirurgia (Bucur). 2012;107(6):722-9

5. Smith HO, Berwick M, Verschraegen CF et al. Incidence and survival rates for female malignant germ cell tumors. Obstet Gynecol 2006;107(5): 1075–1085.
6. Bidus MA, Elkas JC, Rose GS. Germ cell, stromal, and other ovarian tumors. In: Di Saia PJ, Creasman WT, eds. Clinical gynecologic oncology. 8th ed. Philadelphia, Pa: Elsevier/Saunders, 2012;329–356. Crossref, Google Scholar
7. Pauniaho SL, Salonen J, Helminen M, Vettenranta K, Heikinheimo M, Heikinheimo O. The incidences of malignant gonadal and extragonadal germ cell tumors in males and females: a population-based study covering over 40 years in Finland. Cancer Causes Control 2012;23(12):1921–1927. Crossref, Medline, Google Scholar
8. Siegel RL, Miller KD, Jemal A: Cancer statistics, 2019: CA Cancer J Clin. 2019, 69:7-34. 10.3322/caac.21551
9. Arrangoiz R, Papavasiliou P, Dushkin H, Farma JM: Case report and literature review: metastatic lobular carcinoma of the breast an unusual presentation. Int J Surg Case Rep. 2011,2:301-305. 10.1016/j.ijscr.2011.06.010
10. Sheen-Chen SM, Liu YW, Sun CK, Lin SE, Eng HL, Huang WT, Ko SF: Abdominal carcinomatosis attributed to metastatic breast carcinoma. Dig Dis Sci. 2008, 53:3043-3045.10.1007/s10620-008-0529-y
11. Eeles RA. Screening for hereditary cancer and genetic testing, epitomized by breast cancer. Eur J Cancer. 1999;35(14):1954-62.
12. Cannistra, S. A., D. M. Gershenson, et al. (2005). "Ovarian Cancer, Fallopian Tube Carcinoma, and Peritoneal Carcinoma." In V. T. DeVita, T. S. Lawrence, S. A. Rosenberg, eds. Devita, Hellman & Rosenberg's Cancer: Principles & Practice of Oncology, 8th ed. Lippincott Williams and Wilkins; Philadelphia, PA 4(5): 1587-90.
13. Talerman, A. (2002). "Germ cell tumors of the ovary." In R. J. Kurman, ed. Blaustein's Pathology of the Female Genital Tract, 5th ed. Springer-Verlag; New York, NY: 967-1034.
14. Ramesh, H., M. Philip, et al. (2001). "Isolated duodenal-pancreatic involvement due to metastatic dysgerminoma ovary and its management by a modified pancreaticoduodenal resection." Dig Surg 18(6): 479-482.
15. Pendergrass, E. P. and J. Selman (1946). "Dysgerminoma of the ovary with widespread metastases." Radiology 46: 377-379.
16. Mandeville, F. B., P. F. Sahyoun, et al. (1949). "Dysgerminoma of the ovary in a 4-year-old girl with metastases clinically simulating Wilms' tumor and adrenal neuroblastoma." J Pediatr 34(1): 70-75.
17. Zaloudek, C. J. (2011). "Pathology of Germ Cell Tumors." In R. A. Soslow and C. Tornos, eds. Diagnostic Pathology of Ovarian Tumors. Springer; New York, NY: 155-191
18. Zhao, Y., Y. Li. (2003). "Clinicopathological significance of plap, NSE and WT1 detection in ovarian dysgerminoma." Chin J Can Res 15(2): 136-139.
19. Bertozzi S, Londero AP, Cedolini C, et al.: Prevalence, risk factors, and prognosis of peritoneal metastasis from breast cancer. SpringerPlus. 2015, 4:688.
20. Flanagan M, Solon J, Chang KH, et al.: Peritoneal metastases from extra-abdominal cancer – a population-based study. Eur J Surg Oncol. 2018, 44:1811-1817
21. Loman N, Johannsson O, Kristoffersson U, Olsson H, Borg A. Family history of breast and ovarian cancers and BRCA1 and BRCA2 mutations in a population-based series of early-onset breast cancer. J Natl Cancer Inst. 2001;93(16):1215-23.
22. Rubin SC, Benjamin I, Behbakht K, Takahashi H, Morgan MA, LiVolsi VA, et

al. Clinical and pathological features of ovarian cancer in women with germ-line mutations of BRCA1. N Engl J Med. 1996;335(19):1413-6
23. Jóhannsson OT, Ranstam J, Borg A, Olsson H. Survival of BRCA1 breast and ovarian cancer patients: a population-based study from southern Sweden. J Clin Oncol. 1998;16(2):397-404
24. Werness BA, Ramus SJ, Whittemore AS, Garlinghouse-Jones K, Oakley-Girvan I, DiCioccio RA, et al. Primary ovarian dysgerminoma in a patient with a germline BRCA1 mutation. Int J Gynecol Pathol. 2000;19(4):390-4.