

Metaplastic breast cancer: A case report

Serdar Surenkok,¹ Emre Tahberer,² Ahmet Cinkaya,³ Hilmi Kodaz,⁴ Aysenur Deger⁵

Abstract

Metaplastic carcinomas of the breast are very rare and constitute less than 0.5% of all breast cancers. Breast metaplastic carcinomas are aggressive. They have worse prognosis compared to other breast cancers. We present a case diagnosed with metastatic breast cancer due to the rare occurrence of these tumours in treatment of which surgical chemotherapy, radiotherapy and hormonotherapy are employed together.

Keywords: Metaplastic carcinoma, Chemotherapy, Radiotherapy, Surgery.

Introduction

Breast cancer is one of the foremost causes of cancer-related deaths in women. The most common type of breast cancer is invasive ductal carcinoma. Metaplastic carcinomas of the breast (MBC) are very rare and constitute <0.5% of all breast cancers. Breast metaplastic carcinomas are aggressive. They have worse prognosis compared to other breast cancers. Metaplastic breast cancers tend to spread haematogenously. It is a mixed tumour containing malignant mesenchymal and epithelial elements. In general, it is triple negative so it is resistant against hormonotherapy.¹ Metaplastic breast cancers may show similar features with radiological invasive ductal breast cancer. Metaplastic breast carcinomas are generally observed subsequent to 5 decades. They tend to be present with faster growth and larger masses compared to invasive breast cancers. Response ratio is low to adjuvant and neoadjuvant therapy in metaplastic breast cancer. There is no standard chemotherapy regimen. However, taxane based chemotherapy may be effective.² Potential target-based treatments are expected to provide good results. However, there is a small amount of data on these patients.

Case Report

A 56-year-old female patient presented to the Acibadem Eskisehir Hospital Department of Radiation Oncology in

.....
¹Acibadem University, Vocational School of Health Services, ^{2,3}Department of Radiation Oncology, ⁴Department of Medical Oncology, Acibadem Hospital, ⁵Department of Pathology, Dumlupinar University, Turkey.

Correspondence: Ahmet Cinkaya. Email: drahmecinkaya@gmail.com

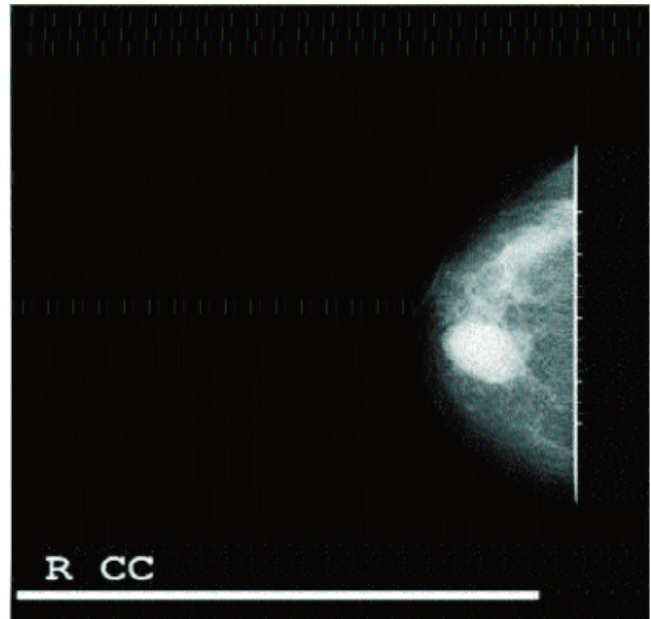


Figure-1: Right breast upper middle quadrant 32mm diameter contour mass with micro lobule.

March 2016, in Turkey. She complained of a mass in her right breast. Positron emission tomography was carried out which showed a 32 mm diameter mass with micro lobule contour in the upper middle quadrant of the right



Figure-2: Straining with ck7 in the epithelial component.

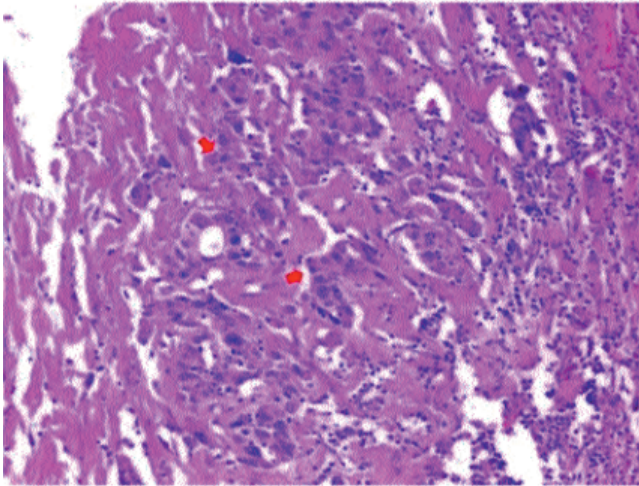


Figure-3: Atypical epithelial cells.

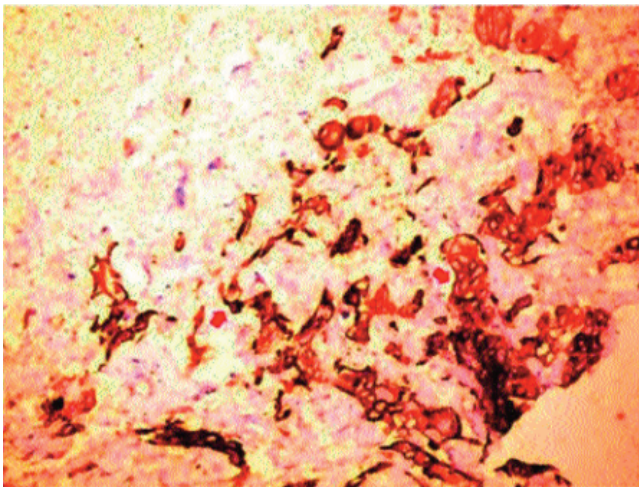


Figure-4: Positive staining with 34be12 in the epithelial component.

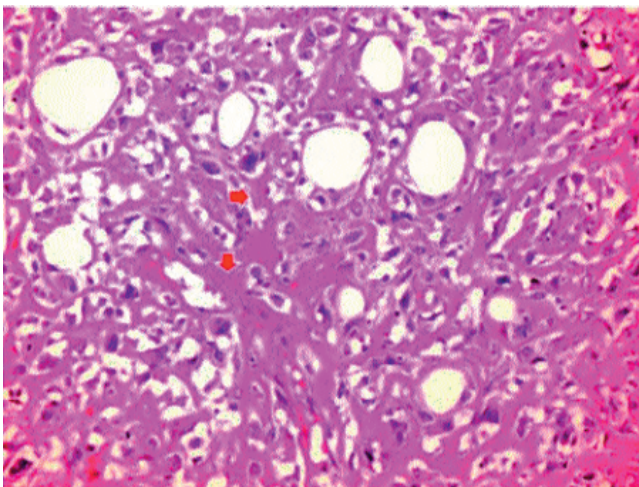


Figure-5: Osteoid around atypical mesenchymal cells.

breast also seen in the mammography done subsequently (Figure-1). No distant metastases were detected and right modified radical mastectomy was performed. The pathology report revealed as metaplastic carcinoma with osseous differentiation. In immunohistochemical staining pankeratin, ck5 / 6, ck7, 34Be12 in the focal area were stained positive and P63, SMA, CD68, Alpha 1 Antitripsin, Vimentin were stained positive in common areas (Figure-2-5). The patient received 4 cycles of taxotere chemotherapy subsequent to 4 cycles of fluorouracil doxorubicine cyclophosphamide. The patient had 50 Gy peripheral lymphatics and chest wall radiotherapy. Routine follow-up of the patient continues showing no complications. No recurrence or metastasis occurred during the 6-month follow-up. This case was approved by the Chairman of Department of Radiation Oncology and consent form was signed by the patient, for publishing the case.

Discussion

MBC is a rarely observed breast cancer. Metaplastic breast cancer was defined first in 1973. It has a bad prognosis. This group constitutes a difficult group of patients in terms of diagnosis, pathology, clinical pathological features and more importantly in terms of patient treatment methods and management. Metaplastic carcinomas are observed usually with other types of breast cancer. In one case series study, 73% of 45 patients with metastatic carcinoma were observed to have invasive ductal carcinoma.³ These tumours overexpress cd44 (+) and yes-associated protein (yap) and positivity of these two markers is associated with epithelial mesenchymal transition (EMT), and development of epithelial mesenchymal transition plays an important role in high risk of breast cancer, carcinogenesis and metastasis.⁴ In general, they are triple negative. There are some mutations in certain genes in MBC patients. The p53 gene cyclin-dependent kinase inhibitor 2A, epidermal growth factor (EGFR) genes play a significant role in cell cycle and carcinogenesis and targeted therapies for MBC patients focus on this gene. Ki67 nuclear protein in MBC patients is overexpressed compared to invasive ductal carcinoma (IDC) patients and this case is associated with poor prognosis.⁵ Clinically palpable mass and uncharacteristic view in patients over 50 is determined by imaging methods such as mammography and Magnetic resonance (MRI) and this makes it difficult to distinguish it from patients with benign breast disease and IDC patients. It grows rapidly and the lymph node metastasis is usually rare and haematogenous metastases and local recurrence is more common compared to other breast cancers.⁶ Prognosis was found to be bad in nodal tumours inpatients under

the age of 40 with skin invasion and squamous cell carcinoma. In addition, the type of surgery, lymph node's positivity, lymphovascular invasion (LVI) also affect the result of disease. Tumour size and grade, and hormone receptor status do not affect the prognosis. Epidermal growth factor receptor (EGFR) expression status has been associated with Ki67 positivity, EMT markers, recurrence of MBC and overall survival (OS).⁷ There are several studies in the literature in which MBC histological subgroups are effective in OS (carcinosarcoma has the worst prognosis)⁸ in another study mixed type has been found with a poor prognosis.³ In another study spindle cell subset was found to have a bad prognosis.³ There are also articles revealing the fact that histologic subtypes are not associated with prognosis in the literature.⁵ Currently there is no standard treatment for this disease group. Surgical localization is the primary treatment for the disease. Surgical modification is usually in the form of mastectomy or radical mastectomy because of the rapid growth of the tumour and the late presentation. The patient underwent modified radical mastectomy (MRM) in our case.

However in selected studies, breast conserving surgery can be performed with a margin of >3 cm, but there is an increased local recurrence in these cases. In studies where radiotherapy was applied it lead to increase OS in MBC patients after MRM or after breast-conserving surgery but when subgroups are examined after applying MRM to tumours less than 5 cm in size and when 4 and less lymph nodes are positive its effect could not be ascertained.⁹ As a result in patients diagnosed with MBC, radiotherapy can be considered as adjuvant as a standard in patients with breast protection surgery and in patients with MRM. There is no standard treatment regimen for adjuvant and neoadjuvant chemotherapy. It is observed that taxane based regimens yield better results compared to others in neoadjuvant chemotherapies however this data is limited.² It has been reported in a case series study of 45 patients that of adjuvant chemotherapy is effective in early-stage disease.³ About 20% or less of MBC patients are hormone receptors (+) thus hormonal therapy is rarely applied in these cases. Hormone therapy has been recommended in most of the studies although it has a worse prognosis compared to other types of breast cancer in which hormone therapy is applied.¹⁰ Patients have a very short life expectancy in metastatic disease. It is planned to improve the patient's quality of life by virtue of palliative care combined with systemic treatment and support. Temsirolimus is frequently utilized as a targeted

treatment. It is used in combination with bevacizumab as it causes vascular endothelial growth factor inhibition.

Conclusion

MBC has a bad prognosis compared to other breast cancer subtypes. There is no standard treatment approach. Main treatment in localized disease is surgery. It can be followed by chemotherapy, radiotherapy, hormonotherapy, trastuzumab and targeted treatment after surgery. It is aimed to reduce the symptoms of the patient and improve the quality of life in metastatic disease. Current studies must focus on next generation specific agents which can improve disease management and prognosis.

Disclaimer: None to be declared.

Conflict of Interest: Nil.

Funding Disclosure: None to be declared.

References

1. Leddy R, Irshad A, Rumboldt T, Cluver A, Campbell A, Ackerman S. Review of metaplastic carcinoma of the breast: imaging findings and pathologic features. *J Clin imaging Sci.* 2012; 2: 21-8.
2. Chen IC, Lin CH, Huang CS, Lien HC, Hsu C, Kuo WH, et al. Lack of efficacy to systemic chemotherapy for treatment of metaplastic carcinoma of the breast in the modern era. *Breast Cancer Res Treat.* 2011; 130:345-51.
3. Cimino-Mathews A, Verma S, Figueroa-Magalhaes MC, Jeter SC, Zhang Z, Argani P, et al. A Clinicopathologic Analysis of 45 Patients With Metaplastic Breast Carcinoma. *Am J Clin pathol.* 2016; 145:365-72.
4. Hayes MJ, Thomas D, Emmons A, Giordano TJ, Kleer CG. Genetic changes of Wnt pathway genes are common events in metaplastic carcinomas of the breast. *Clinical cancer research. J Am Assoc Cancer Res.* 2008; 14:4038-44.
5. Zhang Y, Lv F, Yang Y, Qian X, Lang R, Fan Y, et al. Clinicopathological Features and Prognosis of Metaplastic Breast Carcinoma: Experience of a Major Chinese Cancer Center. *PLoS One.* 2015; 10:e0131409.
6. McKinnon E, Xiao P. Metaplastic carcinoma of the breast. *Arch Pathol Lab Med.* 2015; 139:819-22.
7. Oon ML, Thike AA, Tan SY, Tan PH. Cancer stem cell and epithelial-mesenchymal transition markers predict worse outcome in metaplastic carcinoma of the breast. *Breast cancer Res treat.* 2015; 150:31-41.
8. Wargotz ES, Deos PH, Norris HJ. Metaplastic carcinomas of the breast. II. Spindle cell carcinoma. *Hum pathol.* 1989; 20:732-40.
9. Nowara E, Drosik A, Samborska-Plewicka M, Nowara EM, Stanek-Widera A. Metaplastic breast carcinomas - analysis of prognostic factors in a case series. *Cont Oncol (Poznan, Poland).* 2014; 18:116-9.
10. Paul Wright G, Davis AT, Koehler TJ, Melnik MK, Chung MH. Hormone receptor status does not affect prognosis in metaplastic breast cancer: a population-based analysis with comparison to infiltrating ductal and lobular carcinomas. *Ann Surg Oncol.* 2014; 21:3497-503.