International Journal of Allied Medical Sciences and Clinical Research (IJAMSCR)

ISSN:2347-6567

IJAMSCR |Volume 5 | Issue 2 | Apr - Jun - 2017
www.ijamscr.com

Case Report *Medical research*

Carcinoma of breast with osseous metaplasia: An uncommon pathology

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ABSTRACT

Metaplastic breast carcinoma is a rare breast neoplasm, and metaplastic carcinoma with osseous differentiation is even rarer. It originates from a change in the differentiation of epithelial metaplastic breast tissue cells to squamous cell, spindle cell and/or mesenchymal appearance. We present a case of 49 year old woman who was diagnosed with metaplastic carcinoma of breast with osseous differentiation. This case is reported for its rarity.

Keywords: Breast neoplasm, Metaplastic carcinoma, Osseous differentiation, Immunohistochemistry

INTRODUCTION

Metaplastic breast carcinoma is a rare breast neoplasm with an incidence of 0-2.5% [1]. It originates from a change in the differentiation of epithelial metaplastic breast tissue cells to squamous cell, spindle cell and/or mesenchymal appearance [2]. Thus, metaplastic carcinoma of breast is a rare entity with positive distinguishing features of having epithelial and mesenchymal tissue types incorporated within one tumour [3]. In fewer than 5% of all mammary adenocarcinoma, part of all carcinomatous epithelium is transformed to non-glandular growth pattern by a process referred to as metaplasia [4]. The World Health Organisation (WHO) classification included the following carcinomas within this group of neoplasm: adenosquamous carcinoma of low grade fibromatosis type; metaplastic carcinoma: squamous cell carcinoma; and spindle cell carcinoma with chondroid mesenchymal, bone, or other mesenchymal tissue differentiation [2]. Breast cancer with cartilaginous and/ or osseous metaplasia is a special type of invasive breast cancer and has been reported to occur in only 0.003-0.12% of breast cancer cases [5]. Osseous metaplasia is an exceptionally rare component in metaplastic breast carcinoma [3].

CASE REPORT

A 49 year old female presented with a history of lump in left breast for past four months gradually increasing in size. There was no history of nipple discharge, bleeding or any other symptom. On examination, a firm to hard lump approximately 5x5 cm in size was palpable in the upper inner quadrant of left breast. No evidence of peau de' orange, skin, chest, ribs or nodal involvement neither past radiotherapy nor family history was found. The other breast was normal. Her haematological and biochemical parameters were within normal limits.

Cytologic examination revealed a moderately cellular tumour composed of malignant cells of various sizes and shapes in a necrotic background. The smears were diagnosed as positive for malignancy.

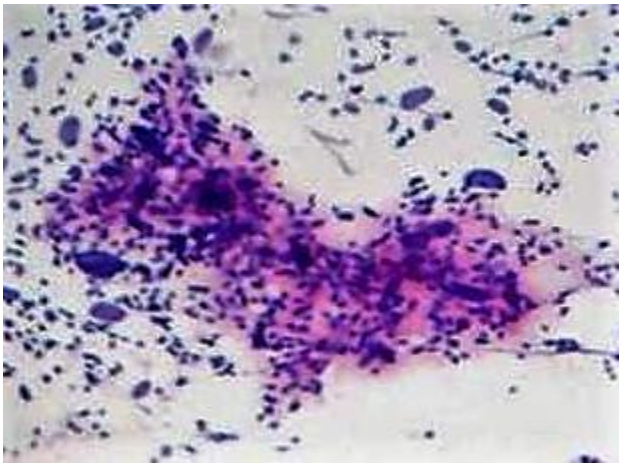

Figure 1: malignant cells with nuclear atypia and polymorphism (H and E)

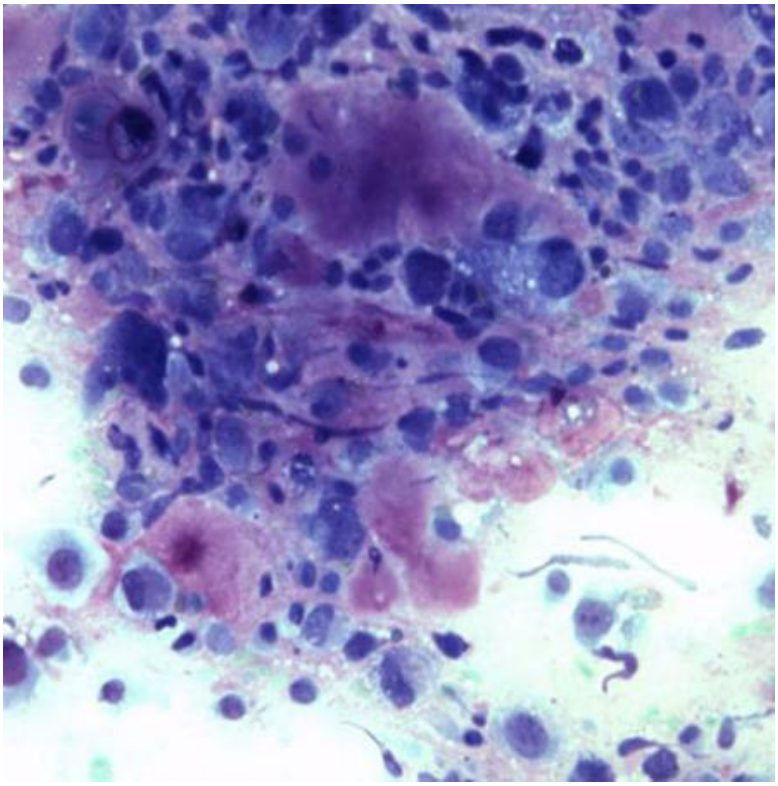

Figure 2: fragments of malignant mesenchymal elements (H and E, x40)

Modified radical mastectomy was done and the specimen was sent for histopathological examination.

Gross examination

The specimen measured 18 x 17 x 4 cm and overlying skin flap measured 18 x 7 cm. The nipple and areola appeared to be normal. On serial sectioning, a tumour was identified which was irregular solid gray white and firm measuring 5 x 5 x 4 cm in the upper inner quadrant. It was located 1 cm from the skin and 0.2 cm from the base. 8 lymph nodes were dissected from the axillary tail.

Figure 3: Gross picture showing an irregular solid gray white tumour mass.

Microscopic examination

Revealed tumour comprised of epithelial and mesenchymal differentiation. The tumour cells were arranged in nests and sheets showing marked nuclear variation. Interspersed areas of osteoid metaplasia with osteoclastic giant cells were present. Few mitotic figures were also seen. No metastatic deposits were seen in all the dissected lymph nodes.

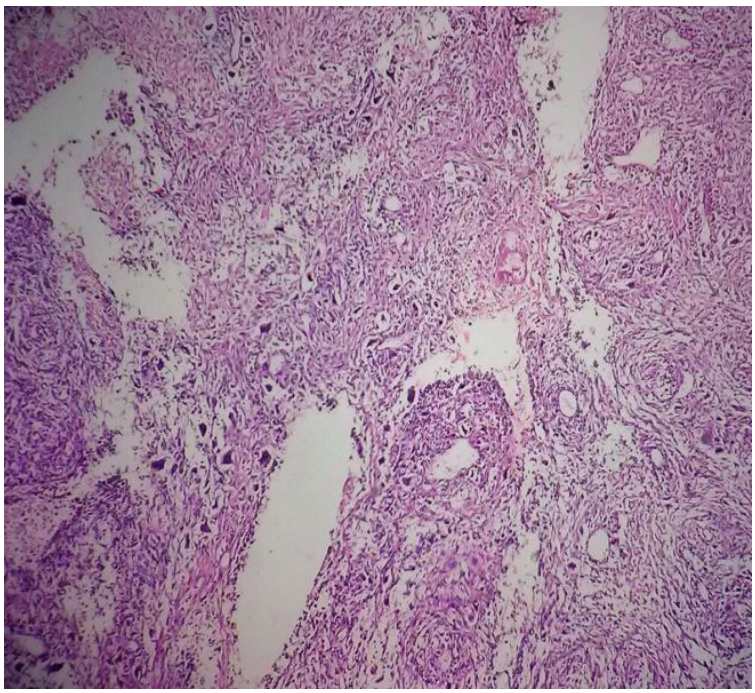

Figure 4: scanner view showing tumor cells arranged in sheets and nest with pleomorphism and nuclear variation.

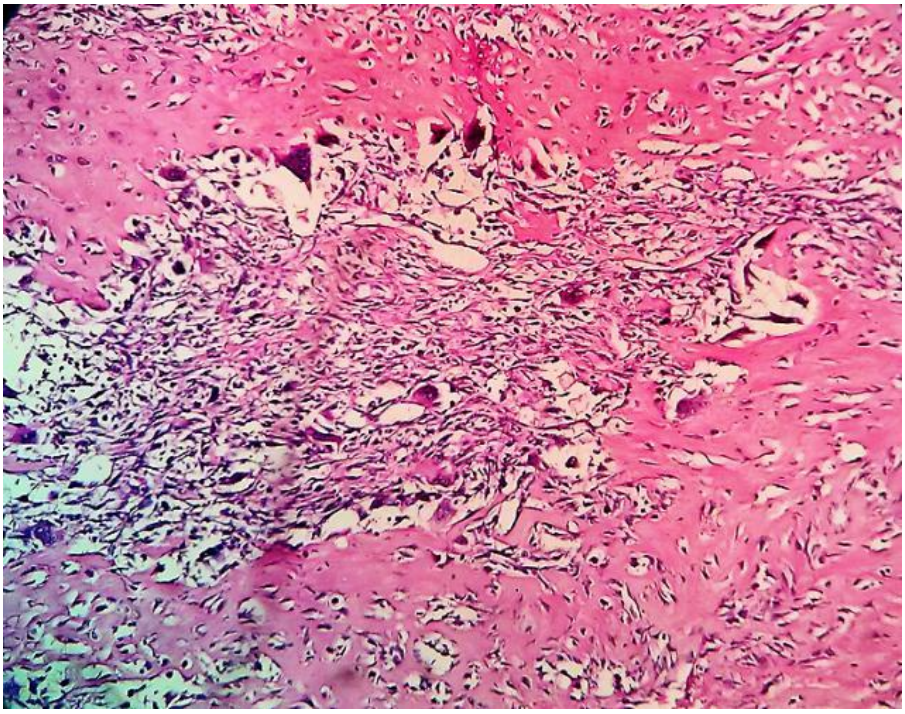

Figure 5: Low power shows pleomorphic tumour cells with osseous metaplasia (H and E, x10)

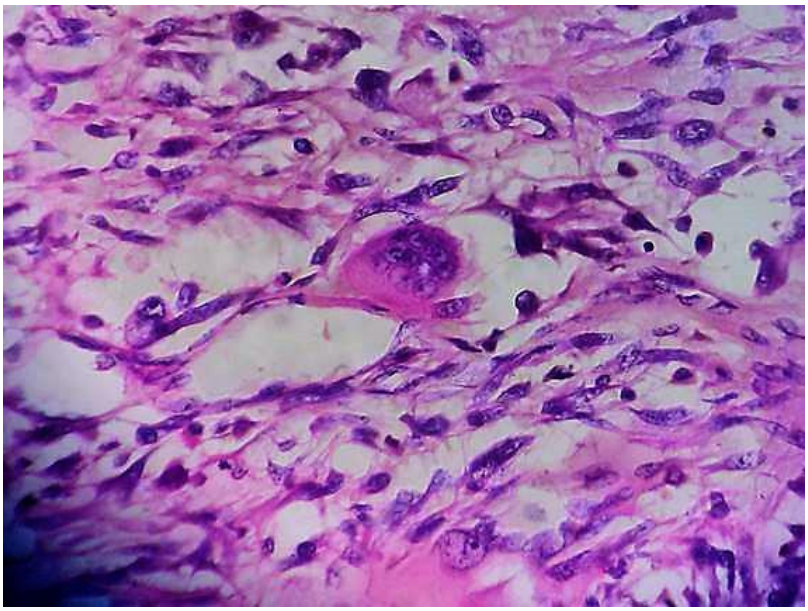

Figure 6: high power shows osteoplastic giants cells (H and E, x40)

Immunohistochemical staining was also performed. The carcinomatous component was positive for cytokeratin. The mesenchymal component showed positive staining for vimentin. All the tumor cells were negative for ER, PR and HER2/ neu overexpression. The final diagnosis was metaplastic breast carcinoma with osteoid differentiation.

DISCUSSION

Metaplastic carcinoma was first defined by Huvos et al [6] and then Tavassoli [7]. It is a poorly differentiated heterogeneous tumor containing

adenocarcinoma cells admixed with dominant areas of spindle, squamous, chondroid or osseous elements. The World Health Organization (WHO) classifies metaplastic carcinoma into epithelial type and mixed type. Epithelial type is, in turn, classified into (1) squamous cell carcinoma, (2) adenocarcinoma with spindle cell differentiation, and (3) adenosquamous carcinoma. Mixed type is classified into (1) carcinoma with chondroid metaplasia, (2) carcinoma with osseous metaplasia, and (3) carcinosarcoma [7]. According to the literature, the median age at the time of presentation ranges from 48 to 59 years [8]. In our case, she is 49 years old. The tumour size is usually bigger and presents with axillary nodal involvement less frequently than standard invasive breast cancer, despite the larger tumor size [9]. Our patient had large tumor mass with no metastatic tumor deposits in any of the axillary lymph nodes. Compared with other types of breast cancer, this type of carcinoma without nodal metastasis does not always predict a favourable prognosis [10, 11]. Metaplastic carcinoma of the breast are characterized by ER/PR and Her2/neu negativity [12]. High predominance of intervening spindle cells, high cellularity, high mitotic activity and high nuclear pleomorphism is associated with poor prognosis. The presence of a sarcomatoid metaplastic element in carcinoma of the breast, be it chondroid, osteoid, or unspecified in nature, is a poor prognostic factor, especially when it predominates the histological findings [9]. The osseous foci in metaplastic carcinoma may appear histologically benign or malignant and it is not clear what proportion of these have malignant (osteosarcoma) or benign osseous differentiation because carcinomas with osseous differentiation have generally been put together with those displaying chondroid differentiation [10]. Wargotz and Norris [13] reported that patients with metaplastic breast carcinoma with histologically benign heterologous elements without intervening spindle cells have favourable survival rate. Metaplastic breast carcinomas have demonstrated a high potential for distant metastasis, particularly in the lung, even if the axillary lymph nodes are negative [14]. According to Lim et al [15] patients with non- triple negative metaplastic carcinoma had poorer prognoses than those with triple negative breast cancer. Our patient had triple negative metaplastic carcinoma with benign heterologous elements. The principles of treatment for metaplastic carcinoma are the same as those for invasive ductal carcinoma, but considering the higher rates of both local and distance recurrence, further research studies will be required to develop targeted treatments so that the clinical outcome improves.

CONCLUSION

Metaplastic breast carcinoma with osseous differentiation is extremely rare. These tumours should be diagnosed and excised at the earliest as they have a poor outcome.

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How to cite this article: Shubhangi Kachore, Pragati Karmarkar. Carcinoma of breast with osseous metaplasia: An uncommon pathology. Int J of Allied Med Sci and Clin Res 2017; 5(2): 450-455.
Source of Support: Nil. **Conflict of Interest:** None declared.