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Osteosarcoma Breast - A Case Report

Authors
Minakshi Roy, Vinita Trivedi, Nishi, Rita Rani, Richa Chauhan, Usha Singh
Department of Radiation Oncology, Mahavir Cancer Sansthan, Patna Bihar India 801505
Corresponding Author
Dr Minakshi Roy
2A2, Dreams Exotica, Bholanandapally, 79 Tilla Agartala Tripura India 799010
Ph: +91-9801276059, Email: *Dr.minakshiroy@gmail.com*

Abstract
Most common histology of breast neoplasm is infiltrating ductal carcinoma. Primary osteosarcoma of breast is a rare histology. A 66-year-old postmenopausal female patient presented in outpatient department with a breast lump in right breast. Then core needle biopsy from right breast lump showed infiltrating ductal carcinoma. The disease became progressive even after multiple cycle chemotherapy. After toilet mastectomy, it showed osteosarcoma of breast. It is a rare case report which shows metaplastic change from an infiltrating duct carcinoma to osteosarcoma after chemotherapy.
Keywords: *Infiltrating ductal carcinoma, osteosarcoma, mastectomy, metaplastic.*

Introduction

Breast cancer is the most common cancer among women with an estimated 1.7 million diagnosed cases (in 2012). Most common histology of breast neoplasm is infiltrating ductal carcinoma. Primary Osteosarcoma of breast is extremely rare and only12.5% of mammary sarcomas are primary osteosarcoma.[1]

Case Report

A 66-year-old postmenopausal female patient presented in outpatient department with a breast lump in right breast. She gave history that she had felt the breast lump about six month ago and that lump gradually increased in size. On clinical examination of breast, we found a 5×4cm breast lump on right breast upper and outer quadrant which was firm, mobile, not fixed to skin but fixed to the underlying chest wall. No axillary lymph node was palpable in right axilla. No supra clavicular lymph nodes were palpable. A complete investigation was done. FNAC from right breast lump suggested infiltrating duct carcinoma. Then core needle biopsy from right breast lump was done. Reports showed infiltrating ductal carcinoma in breast lump ER positive, PR positive, HER 2 neu 3+ by IHC. Ultrasound abdomen, chest X ray, complete blood count, liver function test, kidney function test reports were within normal limits. Clinical staging was T4aN0M0 that is Stage IIIB. Then three cycle of standard Adriamycin based chemotherapy (CAF regimen) was given to this patient. No symptomatic response was there. The lump

increased in size and ulcerative lesion formed over the lump after first cycle of chemotherapy. Ulcer became extensive after three chemotherapies. So, we changed the chemotherapy regimen to weekly paclitaxel (80 mg / sq m). After giving two cycle of weekly paclitaxel there was no response. So, toilet mastectomy was done. Histopathology report of toilet mastectomy showed osteosarcoma. On IHC it showed positive for vimentin but negative for cytokeratin and epithelial membrane antigen.

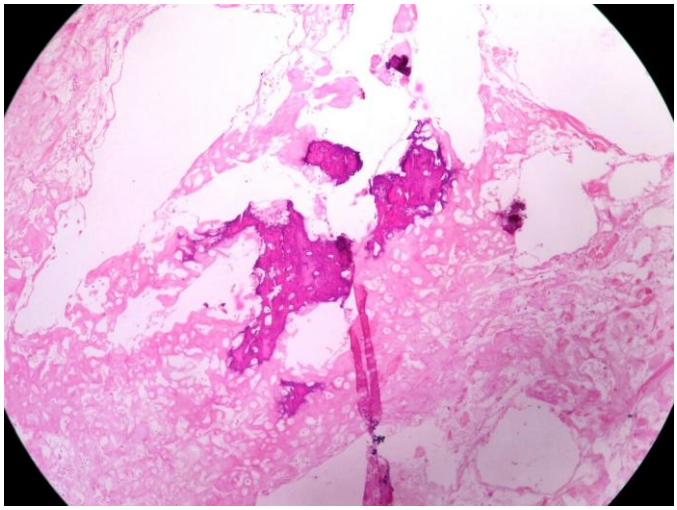

Fig 1: H&E Stain showing the presence of osteoid and malignant tumor cells

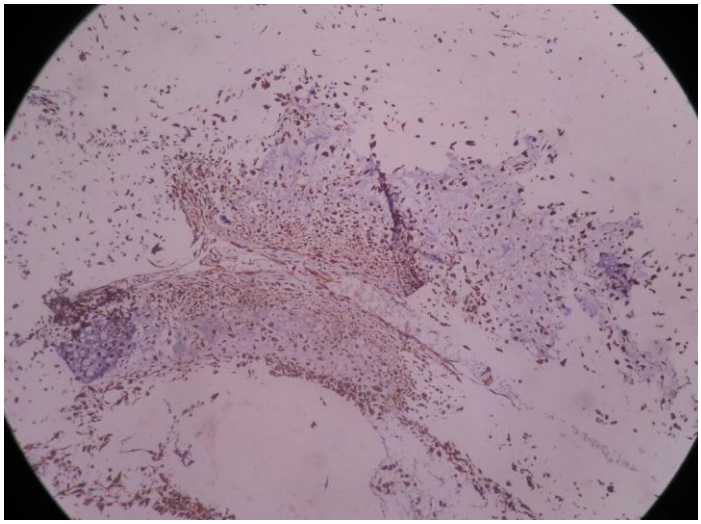

Fig 2: IHC stain vimentin positive

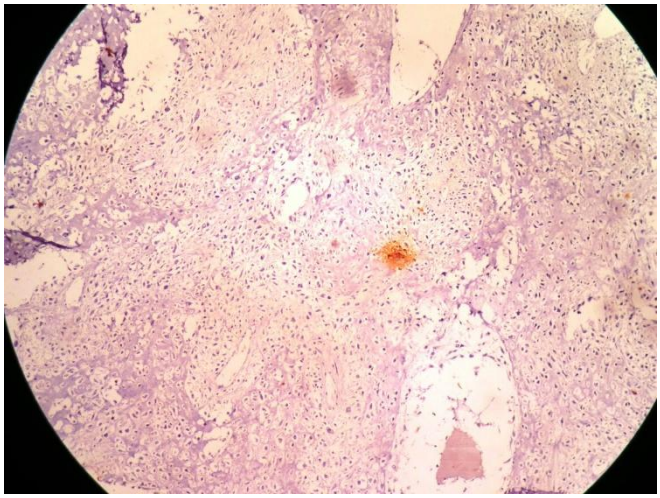

Fig 3:IHC stain Her2/neu postive

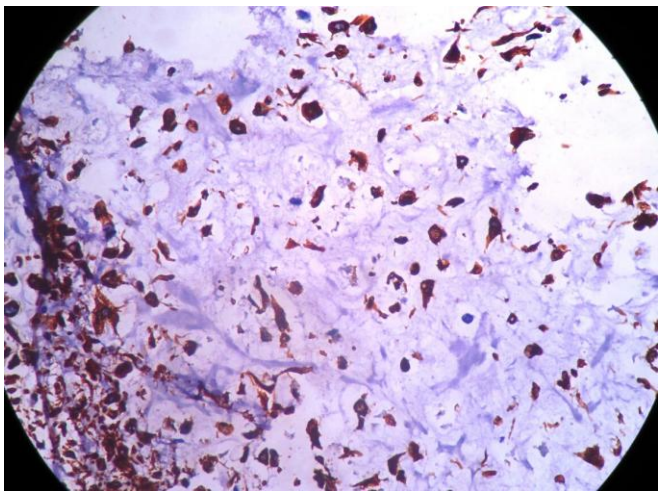

Fig 4: IHC stain ER positive

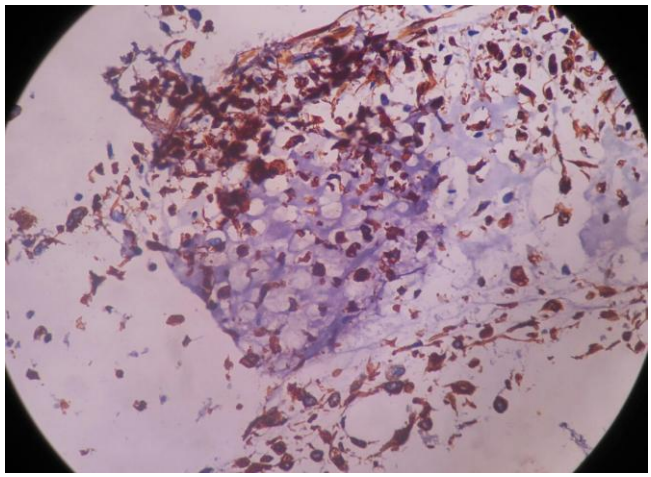

Fig 5:IHC stain PR positive

Discussion

Mammary sarcoma is a rare entity and comprises less than 1% of breast neoplasm.[1-3] Primary osteosarcoma of the breast is an extremely rare neoplasm and represents 12.5% of mammary

sarcomas.[1] Osteosarcoma is a malignant tumor which is composed of spindle cells that produce osteoid and /or bone together with cartilage in some cases. [4] Osteosarcoma may be of skeletal or extra skeletal origin. Extra-skeletal osteosarcoma has been reported in various part of the body including the thyroid gland, kidney, bladder, colon, heart, testis, penis, gall bladder and the cerebellum, breast.[5-11] Osteosarcomas of bone commonly occurs in children and adolescent. On contrary extra skeletal osteosarcomas generally occur in above 50 years of age group. Median age of primary osteosarcoma of breast is 64.5 yrs. [12] Primary osteosarcoma of breast may originate from totipotent mesenchymal cells of the breast stroma or a transformation from a pre-existing breast lesion.[1] Primary carcinoma of breast can have osseous metaplastic changes or phylloides tumor stroma can have whole or partial metaplastic replacement to form osteosarcoma. [13, 14] An osteogenic sarcoma arising from the underlying chest wall bony cage and infiltrating the breast tissue or any other primary skeletal osteosarcoma must be excluded to diagnose primary breast osteosarcoma. In our reported case the primary diagnosis of the disease was infiltrating ductal carcinoma which after chemotherapy and surgery was diagnosed as osteosarcoma of breast. This finding can be explained as metaplastic changes of the primary infiltrating ductal carcinoma of breast. Mammographic findings of osteosarcoma breast vary. In most of the case finding is large mass with relatively well-defined margins and lobulated borders, often containing coarse or dense calcifications, which are sometimes similar to fibroadenomas. [15] Bone-forming neoplasms are strongly suggested by intense focal intake of 99mTc-diphosphonate, a specific radionuclide marker for osteoid tumoral tissue in a soft-tissue tumor. Radiological diagnosis of breast osteosarcoma can be done by this investigation. [15-17] Serum alkaline phosphatase becomes elevated in patients with osteoid-forming neoplasms.[15] But these tests are nonspecific. Definitive diagnosis can be made by histopathological examination. Immunohisto-chemical demonstration of vimentin with absence of epithelial, neural, muscular and other markers suggest the diagnosis of osteogenic sarcoma. [18] In our case the initial HPR was suggesting of infiltrating ductal carcinoma and ER, PR status was positive, Her 2 neu 3+. But the histology of post toilet mastectomy specimen showed presence of osteoid and malignant tumor cells on H & E staining. On immunohistochemical examination of the post-operative histopathological slide was positive for vimentin but negative for cytokeratin and epithelial membrane antigen. This confirms infiltrating ductal carcinoma was transformed by metaplasia into osteosarcoma. Axillary clearance is not necessary as these tumors generally do not spread by lymphatic route.

As primary osteosarcoma is a rare disease there is no proper guideline for treatment is available. It can be treated by surgery like wide local excision or mastectomy depending on the size of the tumor and remaining normal breast tissue. As margin status is a major deciding factor of local disease recurrence, surgery is aimed to achieve a negative margin. This tumor generally metastasises in hematogenous route. So lymph node dissection is not needed.[19] Prognostic factors for primary osteosarcomas of the breast include tumor size, number of mitoses, and presence of stromal atypia.[20] There is little evidence on the long-term prognosis of the disease due to the small number of cases reported in the literature. In a study of 50 patients with primary breast osteosarcoma, Silver and Tavassoli reported a 5-year survival of 38%, with 28% percent of patients developing local recurrence and 41% distant metastases.[21] Hematogenous metastases most commonly occurred in the lungs (80%), bone (20%), and liver (17%). Indications for adjuvant chemothe-rapy and radiation therapy, in the absence of specific data on breast sarcoma, should follow those for soft-tissue sarcomas in general.[22] The role of postoperative radiotherapy and chemotherapy in curatively resected soft-tissue

sarcomas is still controversial. Whether adjuvant radiotherapy should be used remains unclear, although several studies reporting on a small number of patients suggest that adjuvant chemotherapy may be of value in patient management. [23]

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