

## CASE REPORT

# Primary chondroblastic osteosarcoma of the breast. Case report and review of the literature

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### Abstract

Primary osteosarcomas of the breast are rare tumors. We report a 58-year-old woman who presented with a left breast lump suggestive of phyllodes tumor. A sectorectomy was performed and histological examination revealed a chondroblastic osteosarcoma, an unusual finding. Two months later she underwent a mastectomy. A review of the literature revealed the divergency of therapeutic options.

**Keywords:** breast, osteosarcoma.

### Introduction

Sarcomas of the breast are rare tumors [1, 2], their estimated frequency being less than 1% of all malignant breast tumors.

Almost all histological subtypes of sarcomas have been reported in the breast, primary osteosarcomas being extremely rare. Brustugun OT *et al.* [3] found less than a hundred cases published till 2005, most of them reported as single cases [4–15]. A review including fifty cases diagnosed between 1957 and 1995 was published by Silver SA and Tavassoli FA [16].

The low number of published cases, the lack of clear guidelines for adjuvant therapy and the peculiarities of the histological picture justify the report of this case.

### Patient and methods

The patient, a 59-year-old woman, noted a tender mass in her right breast. After few months she presented with a lump in the medial upper quadrant, about 5 cm in diameter, mobile, with an irregular contour. Clinical data suggested a phyllodes tumor. A sectorectomy was performed and the surgical specimen was submitted to the department of pathology. Two months later, based on histological findings, a mastectomy was performed.

The surgical specimen was grossly examined and pieces of it were fixed in 10% formalin, embedded in paraffin and cut at 5 μm. The slides were stained with Hematoxylin–Eosin (HE).

### Results

Gross inspection revealed a tumor mass, 4 cm in diameter, rather well delineated. The cut surface was yellow-white and the consistency was firm, with a strong-hard central nodule.

The *histological* panel was dominated by a chondrosarcomatous proliferation, with large amounts of basophilic matrix in which were embedded atypical neoplastic cells (Figure 1). In other areas of the lesion, there was a dense population of spindle-shaped cells, with deposits of osteoid (Figures 2 and 3) and bony matrix (Figure 4), both produced by the mesenchymal cells. These findings were consistent with the diagnosis of osteosarcoma. Occasionally, the bony matrix was seen at the periphery of chondroid lobules (Figure 5). There were a moderate to marked cellular atypia and a marked mitotic activity (Figure 6). The final histological diagnosis was high-grade chondroblastic osteosarcoma.

### Discussions

Primary osteosarcomas should be separated from malignant phyllodes tumors [16, 17] with malignant heterologous differentiation such as osteosarcoma. Other entities which should be excluded are: osteosarcomatous differentiation in carcinoma of the breast (metaplastic carcinoma) [18], which probably are of myoepithelial differentiation [19], osteogenic sarcoma arising from the underlying ribs or sternum [20], metastatic osteosarcoma [16].

Most osteosarcomas arise as *de novo* conditions, but a minority may be linked to some predisposing factors. Radiation therapy was implicated in some cases [16]. Several authors mentioned the associations between osteosarcoma and fibroadenoma [3, 21] and Remadi S *et al.* [22] raised the question whether osteosarcoma of the breast is a malignant tumor *de novo* or developed by transformation of a fibroadenoma. Neither clinical features nor macroscopic findings are specific [23].

The histological appearance of the tumors varies according to the cellular composition (fibroblastic, osteoblastic, osteoclastic), as well as the type and

amount of the matrix (osteoid, osseous, chondroid). Chondrosarcomatous components are rarely seen [16,23]. In our case there was an overwhelming chondrosarcomatous component which might have suggested an erroneous diagnosis. Multiple fragments of the tumors should, therefore, be examined.

The prognosis is severe, with an overall five-year survival of 38%. Recurrences were more frequently noted in the patients treated by local excision than in those treated by mastectomy. Metastases, most commonly in the lung, are seen in the absence of axillary node involvement. Therefore, total excision without axillary dissection is advised.

The role of chemotherapy is not yet well established. It is not recommended by some authors [24], especially: in low-grade tumors, with no evidence of metastases and adequate local excision [25]; in older patients, due to the treatment toxicity. Most authors advocate adjuvant chemotherapy [3,26], even though extraosseous osteosarcoma seem to be less responsive to chemotherapy than osseous osteosarcoma.

It is not clear whether postoperative radiotherapy is beneficial. It should be considered, however, in case of inadequate surgical margins, when further surgery is not possible.

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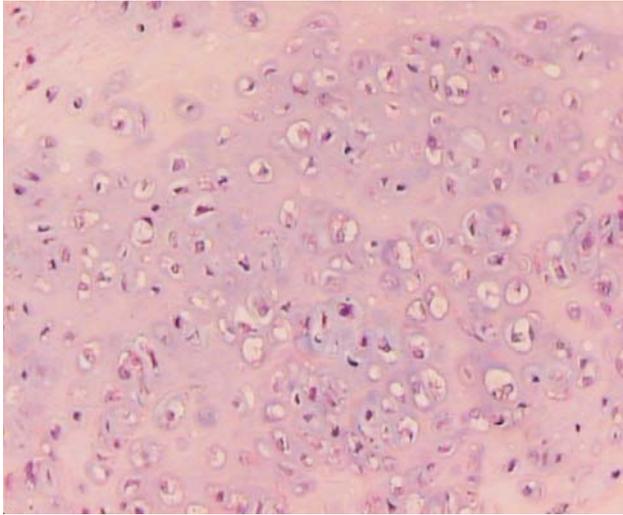
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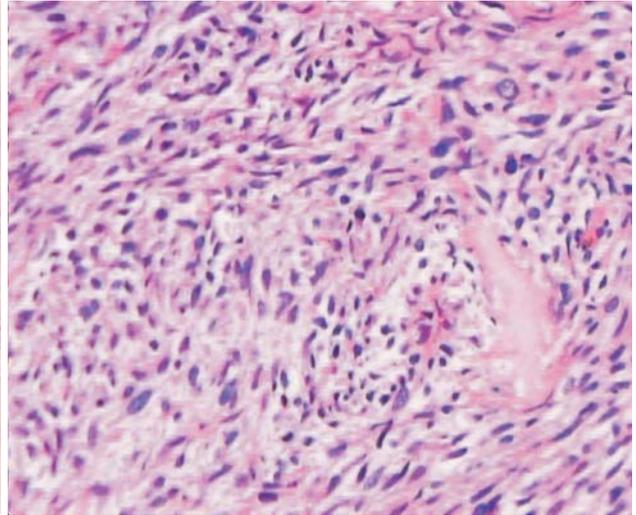
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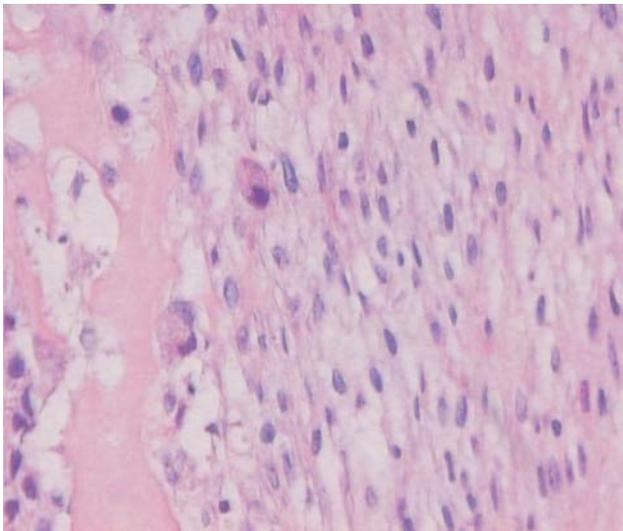
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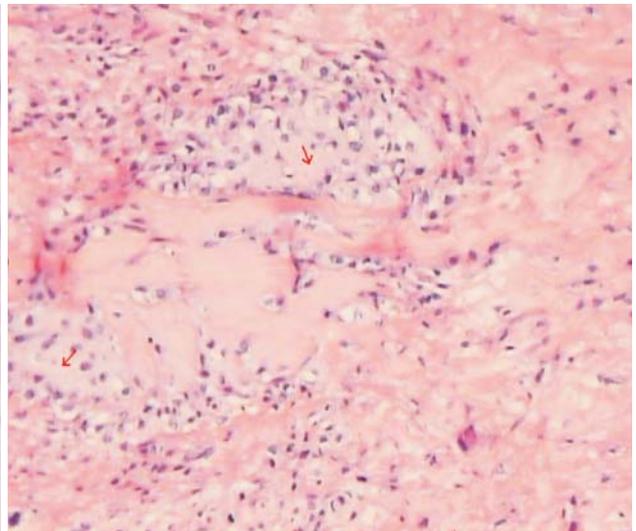
**Figure 1** – Tumoral area showing a chondrosarcomatous appearance. The atypical neoplastic cells are embedded in a basophilic matrix (HE stain, ob. ×50)



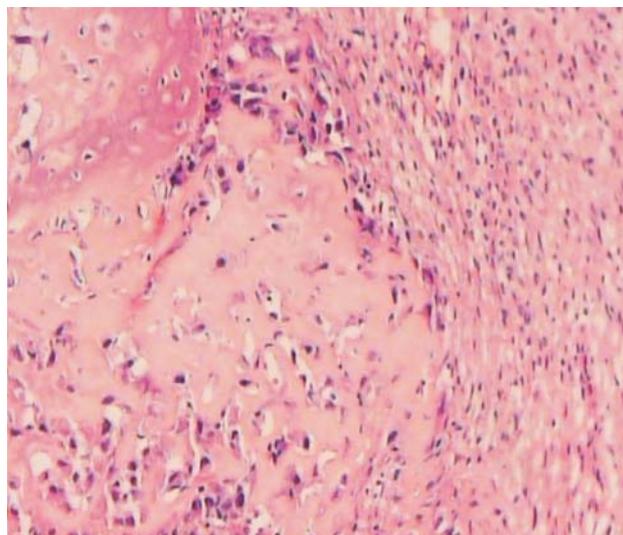
**Figure 2** – A dense population of spindle cells, with marked atypia was present in some areas of the lesion. On this background one may see a small homogenous, eosinophilic deposit of osteoid (HE stain, ob. ×50)



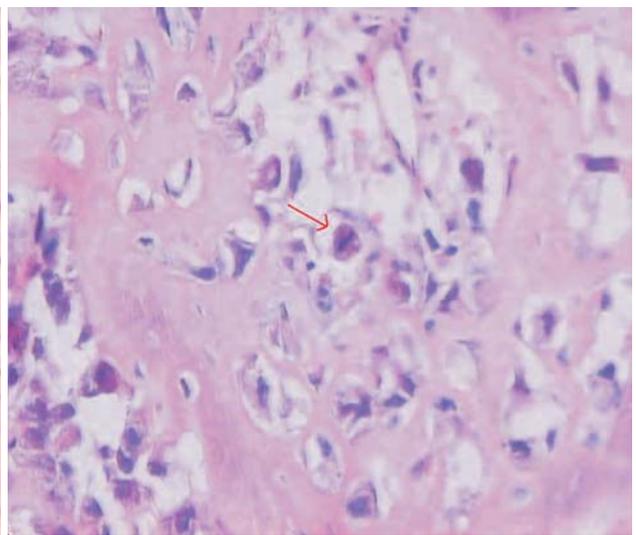
**Figure 3** – Higher magnification of the previous area showing osteoid (left) and atypical stromal cells (HE stain, ob. ×100)



**Figure 4** – Intermingled areas of chondrosarcoma (arrows) and osteosarcoma (HE stain, ob. ×25)



**Figure 5** – A typical osteosarcomatous area, with osteoid and bony trabeculae rimmed by spindle-shaped neoplastic cells (HE stain, ob. ×25)



**Figure 6** – High-power magnification of the previous area showing marked atypia of the neoplastic cells and a mitotic figure (arrow) (HE stain, ob. ×100)