MALIGNANT PHYLLODES OF BREAST WITH HETEROLOGOUS DIFFERENTIATION: A RARE CASE REPORT

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ABSTRACT

Sarcomas of the breast are rare neoplasms accounting for less than 1% of breast malignancy. Phyllodes tumours are rare biphasic tumours of the breast. We present a case of a 42-year-old-female with left breast mass measuring 12 x 8 cm who underwent mastectomy and on histopathological examination, a diagnosis of malignant phyllodes tumour with heterologous differentiation of osteosarcoma along with osteoclast-like giant cells and chondrosarcoma was rendered. The heterologous elements were tumour osteoid formation and tumour chondroid formation. The rarity of malignant phyllodes showing stromal elements of osteosarcoma and chondrosarcoma differentiation was considered when reporting this case.

KEYWORDS
Heterologous Differentiation, Malignant Phyllodes, Osteoclast-like Giant Cells, Osteosarcoma, Chondrosarcoma.

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INTRODUCTION: Phyllodes tumour of the breast is a biphasic fibroepithelial neoplasm and accounts for 0.3-1.5% of all female breast tumours.[1] The majority of these are benign, with the remainder divided between borderline and malignant subtypes. Heterologous sarcomatous stromal elements, such as, chondrosarcoma, liposarcoma, osteosarcoma, rhabdomyosarcoma, angiosarcoma, and leiomyosarcoma are rarely encountered in a malignant Phyllodes tumour.[2] The rarity of malignant phyllodes showing stromal elements of osteosarcoma and chondrosarcoma was considered when reporting this case.

CASE DETAILS: A 42-year-old woman with a past history of previous surgery for left breast lump diagnosed as Borderline Phyllodes tumour one year ago, presented to the Surgical Outpatient Department for recurrent left breast swelling which was rapidly growing since 2 months. Local examination revealed a 12 x 8 cm, hard, nontender mass, with restricted mobility, not attached to the overlying skin or to chest wall was noted in the upper outer quadrant of the left breast. There was no history of weight loss, nipple discharge or pain. Axillary lymph nodes were not palpable. The right breast and axilla were unremarkable.

Ultrasound examination of the left breast showed evidence of large heterogenous ill-defined lesion measuring 8 x 7 cm noted in upper outer quadrant with multiple large cystic areas within. Left axilla had no significant lymphadenopathy. Right breast was unremarkable.

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Fine needle aspiration cytology was given as Fibrocystic Disease of left breast.

The patient was posted for surgery and mastectomy was done subsequently. The excised specimen was sent to our department. The received specimen was formalin fixed, routinely processed and bits were submitted for histopathological examination.

GROSS EXAMINATION: The mastectomy specimen measured 12 × 10 × 5 cm. The cut section revealed a relatively circumscribed, predominantly solid grey white tumour measuring 8 × 6 × 3.5 cm, with focal myxoid areas and cystic areas, surrounded by a fibrofatty tissue thickness ranging from 1 cm to 2 cm [Figure 1, 2].

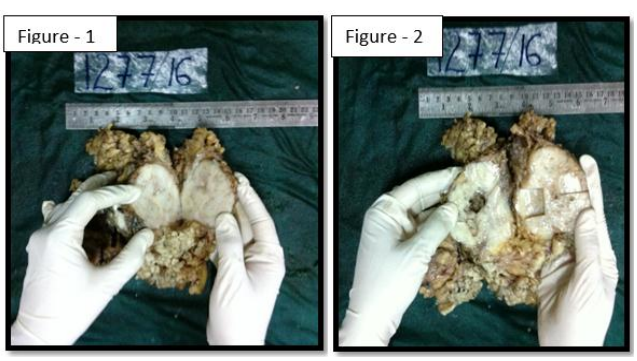
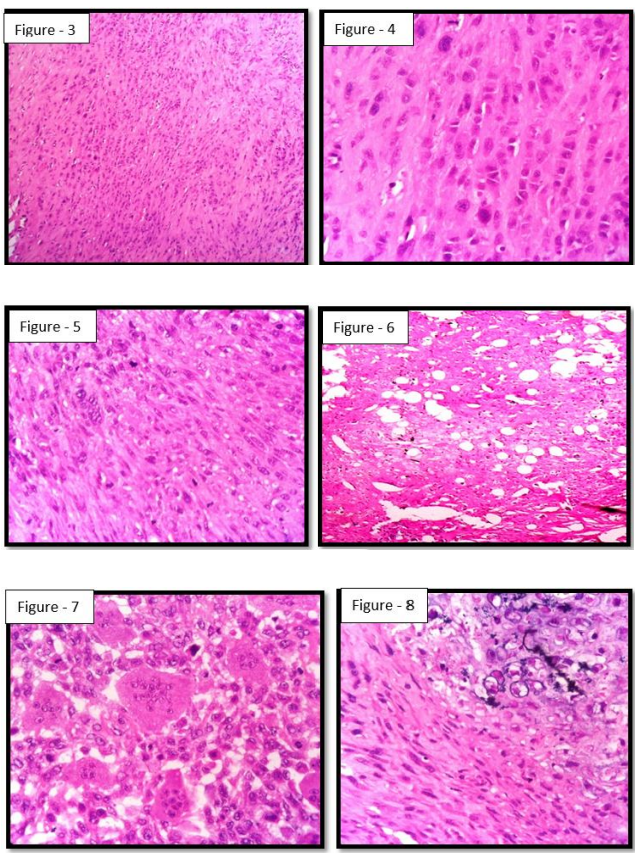


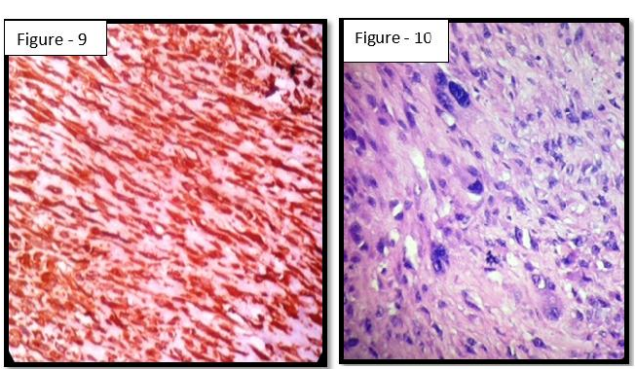
Fig. 1, 2: A Well-circumscribed 12 x 10 x 5 cm Solid Grey-white Tumour, with Cystic Areas along with Fibrofatty Tissue

LIGHT MICROSCOPY: Microscopy revealed a biphasic focally infiltrative tumour with stromal overgrowth and focal leaf-like spaces lined by a bilayer bland epithelium. Tumour tissue is arranged in diffuse sheets and fascicles with infiltrating pushing borders [Figure 3]. Individual cells are plump spindle shaped with moderate amount of eosinophilic

cytoplasm, spindled hyperchromatic nucleus seen [Figure 4]. Many bizarre giant forms with multi-nucleation are also seen. Brisk mitotic activity of 3-4/hpf was noted [Figure 5]. The stroma was highly heterogeneous, areas of necrosis and haemorrhage, osteoid formation [Figure 6] rimmed by tumour cells, along with osteoclastic giant cells [Figure 7] and chondroid differentiation [Figure 8]. Lymphovascular tumour emboli were not seen. The surgical margins were adequate and free of tumour. Resected three lymph nodes showed reactive hyperplasia.



Haematoxylin & Eosin stained sections showing tumour tissue along with osteoid and cartilaginous foci and osteoclast-like giant cells.



Immunohistochemistry revealed Vimentin as diffuse strong cytoplasmic positivity [Figure – 9] in tumour cells suggesting mesenchymal origin and negative for Cytokeratin [Figure – 10].

A diagnosis of Malignant Phyllodes tumour with a heterologous component of osteosarcoma and chondrosarcoma was rendered.

DISCUSSION: Sarcomas of the breast are rare neoplasms accounting for less than 1% of breast malignancy.[3] Malignant phyllodes account for 0.18% of all breast malignancies.[4] Phyllodes tumours with heterologous differentiation of osteosarcoma and chondrosarcoma are rare, accounting for 1.3% of all phyllodes tumours.[4] They are fast growing tumours that originate from peri-ductal stroma and are composed of both epithelial and stromal components.[5] These rare cases have been limited to case reports.[6]

In the population of Asian women, the incidence of phyllodes is 6.92%, as compared to the western population, where the quoted incidence is 0.3 to 1.5%.[3]

Tumours of the breast showing bone and cartilage differentiation are: Intraductal papilloma with stromal metaplasia, cystosarcoma phyllodes, stromal sarcoma, and adenocarcinoma with metaplasia.[5] The process of the formation of bone and cartilage is different in each category. In adenocarcinoma, metaplasia of the epithelial cells to cartilage or bone occurs, while in cystosarcoma and intraductal papilloma there is metaplasia of the stromal cells.[7]

Osteosarcomatous differentiation in a malignant phyllodes tumour is mostly seen in middle and older age groups. The cases present as asymptomatic lumps, frequently in the upper outer quadrants, and have an almost equal distribution in both breasts. The size of the tumour varies from 2 to 40 cm in diameter.[8]

According to Tavassoli,[9] the osteosarcomatous component occupies a variable percentage of the stroma of the phyllodes tumour, ranging from 25% to 100% of the neoplasm. In the majority of cases (86%), osteosarcoma involves at least 75% of the phyllodes tumour.

The association of PTs with heterologous sarcomatous differentiation is a rare occurrence with only 4 previously reported cases in English literature.

Our case had a prior surgery (lumpectomy) for left breast lump, the slides and report were reviewed. The previous report was signed off as Borderline Phyllodes tumour. The recurrent tumour was present since one year, but a sudden painless increase in the size of the tumour indicated a malignant change in a benign tumour. The finding of malignant heterologous stromal elements placed the tumour in a malignant category.[10]

Various investigators have found cellular pleomorphic, stromal overgrowth, tumour necrosis, and heterologous stromal elements or the combination of histological features to be prognostically useful.[11] According to Hawkins et al., four features - high mitotic count, stromal overgrowth, severe nuclear pleomorphism, and infiltrating margins - were useful predictors for the development of metastases.[12] They also showed that the most reliable predictor for metastasis was the presence of stromal overgrowth, and a primary tumour with stromal overgrowth

had a 72% risk of metastatic spread.[13] Hence, these patients need a close follow-up with a CT scan of the bones and lungs.

Management is similar to that of other sarcomas of the breast, with mastectomy being the treatment of choice.

CONCLUSION: Phyllodes tumours are rare fibro epithelial malignancies of the breast, accounting for less than 1% of malignant breast tumours. Further malignant differentiation of phyllodes tumours can occur, resulting in cases of extremely rare heterologous sarcomatous differentiation. Overall mammary sarcomas are biologically aggressive tumours characterised by early recurrence and haematogenous metastasis. Hence, they need a close follow-up with a CT scan for local recurrence and distant metastasis.

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