CASE REPORT

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Male Mammary Myofibroblastoma Masquerading as Malignancy

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ABSTRACT

We report a case of myofibroblastoma (MFB) of the breast in a 58-year-old man who presented with a large painless lump in the left breast. Radiologic breast imaging showed a well-circumscribed mass with no microcalcifications. Microscopic examination revealed fascicles of spindle cell neoplasm with intervening thick bundles of hyalinized collagen and interspersed vessels. Pertinent immunohistochemistry markers showed positivity for CD34, estrogen receptor, progesterone receptor and androgen receptor. A diagnosis of MFB of the breast was rendered. It is crucial to differentiate MFB from other entities in the breast like fibroadenoma, phyllodes tumor, gynecomastia, carcinoma and sarcoma for its appropriate management.

Keywords: Myofibroblastoma; male breast; immunohistochemistry; benign; mesenchymal tumor

KEY POINTS

- Myofibroblastoma
- Male breast
- Immunohistochemistry
- Benign
- Mesenchymal tumor

Introduction

Myofibroblastoma (MFB) is an uncommon mesenchymal neoplasm seen chiefly in the breast. It is commonly reported in the middle aged and elderly of both sexes. The differential diagnosis for a male breast mass includes gynecomastia, infection, lipoma, metastatic disease, and schwannoma, which are more likely than MFB due to its rarity. A hormonal etiology for MFB is suggested because of the expression of sex steroid hormone receptors by tumor cells. An association with pseudoangiomatous stromal hyperplasia (PASH) and gynecomastia has also been suggested. We discuss the pertinent clinical, radiological and histopathological characteristics of MFB in a 58-year-old man with a large lump in the left breast. Clinical and radiological correlation and biopsy evaluation with appropriate immunohistochemical markers to confirm diagnosis is essential for an appropriate treatment approach (1, 2).

Case Presentation

A 58-year-old man visited the surgical oncology department because of the presence of a large lump in the left breast for two

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months. The lump was painless and not associated with nipple discharge. He had no significant past history or family history. He was a chronic tobacco chewer. On examination of the left breast, a well-defined, firm mass of 10x8 cm was noted which was freely movable, non-tender and not fixed to the chest wall or overlying skin. No skin ulceration or secondary skin changes were seen. No axillary lymphadenopathy was noted.

Diagnostic bilateral mammography (Figure 1) revealed a well-circumscribed oval 10x6 cm high-density mass lesion of suspicious appearance in the central quadrant of the left breast with fat halo sign, and assessment with the Breast Imaging-Reporting Data System (BIRADS) resulted in a grading of 4B (BIRADS 4B). Ultrasound (USG) correlation of left breast confirmed a well-circumscribed hypoechoic solid 95x55 mm mass lesion with some internal vascularity in the central quadrant with well-defined margins. Microcalcifications and axillary lymphadenopathy were not noted. The right breast showed round grouped microcalcifications in the upper inner quadrant adjacent to skin with no significant abnormality detected on USG (BIRADS 2).

Subsequent to the mammography, a tru-cut biopsy was performed. Microscopy of hematoxylin and eosin (H&E) sections showed a spindle cell lesion with intervening bands of hyalinized collagen. No necrosis, mitosis or significant cytologic atypia was seen. On immunohistochemistry (IHC), positivity for CD34 and progesterone receptor (PgR) was seen. A provisional diagnosis of MFB was rendered.

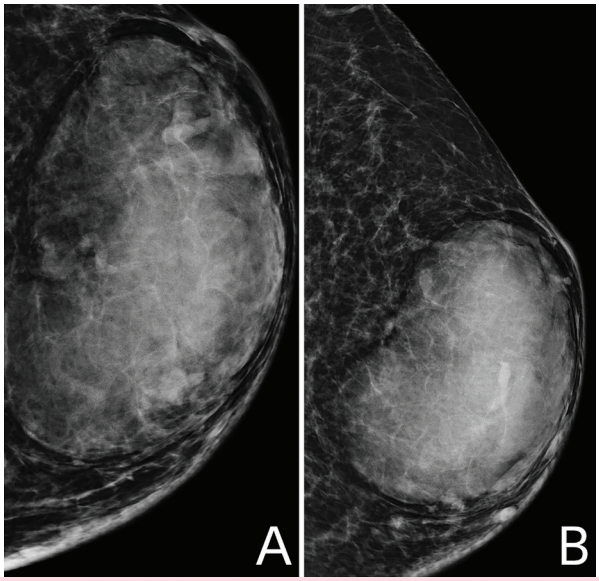

Figure 1. Mammography images (A) Craniocaudal, (B) Mediolateral oblique views. A large oval circumscribed high density mass lesion measuring 10x6 cm is seen in the retro-areolar region with a fat halo sign, suggestive of a Breast Imaging-Reporting Data System 4B mass lesion

A simple mastectomy of the left breast was performed in view of the above diagnosis. Wide local excision is generally the preferred approach for small, well-localized mammary MFBs that occupy a limited portion of the breast, as it provides complete removal with adequate margins while preserving breast tissue. In our case, however, the patient presented with a large, well-circumscribed mass measuring 10 cm in greatest dimension, involving almost the entire breast parenchyma. Under such circumstances, achieving adequate margins through wide local excision would not have been possible without significant breast deformity. Therefore, a simple mastectomy was performed to ensure complete excision. Gross examination (Figure 2) revealed a circumscribed, reddish-brown mass in the central quadrant which was not infiltrating the adjoining mammary tissue. Microscopy of H&E sections showed a non-encapsulated, benign spindle cell neoplasm composed of multiple nodules divided by fibrous septae of variable thickness. Multiple slit-like and a few ectatic congested vessels were seen. The tumor showed fascicular arrangement, storiform pattern and whorls of elongated to oval cells exhibiting mild nuclear pleomorphism, vesicular chromatin, occasional tiny nucleoli, and moderate amounts of well-defined cytoplasm (Figure 3). Extracellular thick bands of collagen, edema, interspersed mast cells and foci of perivascular lymphocytic inflammation were seen. Mitosis was sparse. No necrosis, calcification, *in situ* component or malignant epithelial component was noted. No entrapped mammary ducts or lobules were seen. Histopathological examination confirmed clear surgical margins, and the postoperative course was uneventful. On IHC, tumor cells expressed positivity for CD34, desmin, estrogen receptor (ER) and PgR. The Ki-67 labeling index was 2% (Figure 4a-d). IHC for pan-cytokeratin, p63, alpha smooth muscle actin (SMA) and S100 protein were negative. Based on the microscopic

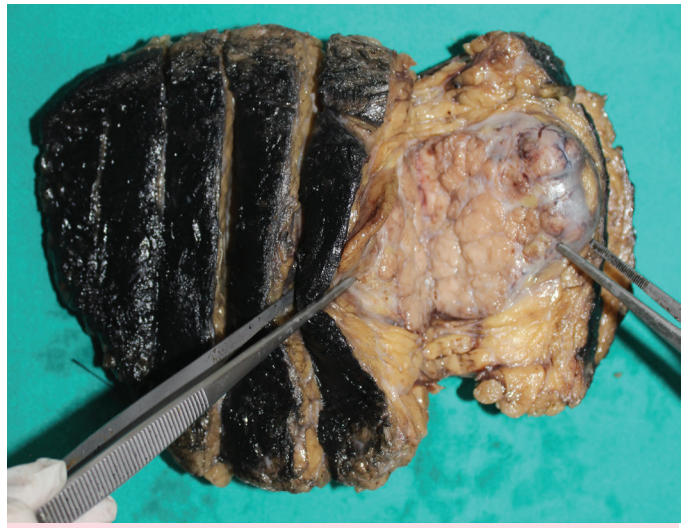

Figure 2. Gross image showing a large circumscribed reddish-brown mass

evaluation and IHC, a final diagnosis of MFB was confirmed. As mammary MFB is a benign spindle cell neoplasm with no reported risk of recurrence or metastasis following complete excision, no adjuvant therapy was administered. The patient has been kept under regular follow-up and remains disease-free to date. Written informed consent was obtained from the patient for publication of this case report and accompanying images.

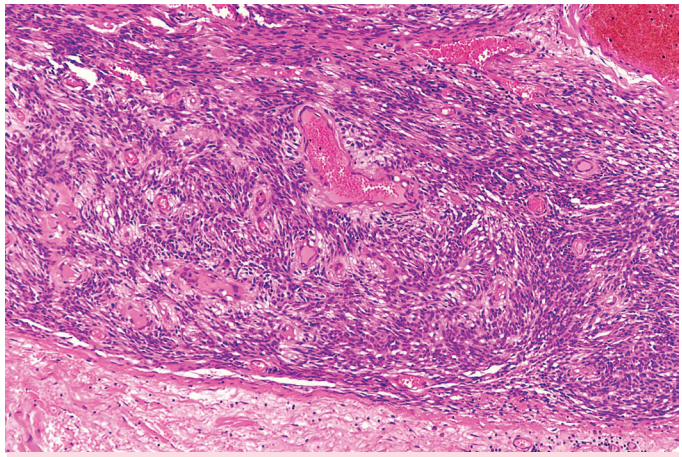

Figure 3. Hematoxylin and eosin stain, 100X, A non-encapsulated, benign spindle cell neoplasm with multiple slit-like to ectatic congested vessels. Fascicular arrangement, storiform pattern and whorls of elongated to oval cells with mild nuclear pleomorphism, vesicular chromatin, occasional tiny nucleoli, and moderate amounts of well-defined cytoplasm. Extracellular thick bands of collagen are evident

Discussion and Conclusion

Soft tissue tumors in the breast are quite uncommon in comparison to malignant neoplasms in the breast, including carcinomas. Hence, a wide range of differential diagnosis are considered. Benign soft tissue neoplasms are uncommon, with lipoma being more common among this group and spindle cell hemangioma the rarest among them. MFB is an uncommon mesenchymal neoplasm. It was initially reported in the mammary region with purported origin from mammary stromal cells. Extramammary regional involvement has been reported, including head and neck, popliteal fossa, inguinal and para-testicular region, gluteal region and vulva (3). Hormonal etiology, gynecomastia and PASH have been implicated in its etiopathogenesis (4).

MFB usually presents as a unilateral, painless and mobile breast mass. Rarely, bilaterality and multicentricity may be seen. It affects elderly men and women equally. However, due to regular breast screening in women, the detection of these masses is much earlier and easier. Mammographic and USG

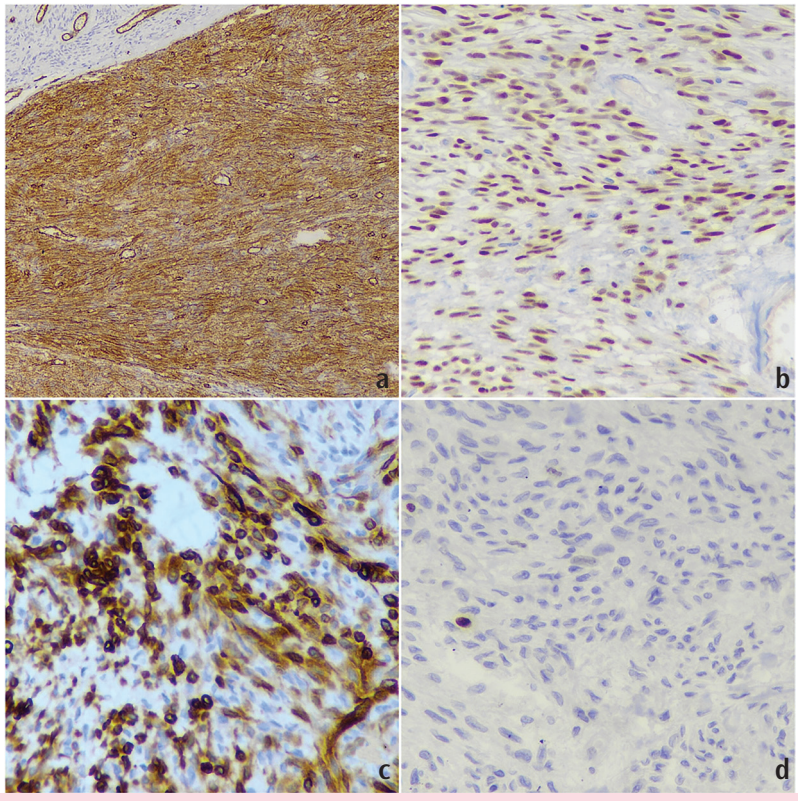

Figure 4. Immunohistochemistry, 100X. (a) CD34, (b) estrogen receptor, (c) desmin, and (d) Ki-67

imaging show a well-circumscribed, lobulated and homogenous mass with no evidence of microcalcifications. However, on USG imaging, differentiation from fibroadenoma may be difficult (5-7). Owing to its rarity, MFB can mimic several benign and malignant neoplasms of the breast, both clinically and radiologically. A careful assessment based on gross, microscopic and IHC correlation is essential to arrive at a correct diagnosis for appropriate management. Fine needle aspiration cytology has a limited role due to high chances for misdiagnosis. Thus, a core biopsy with IHC plays a pivotal diagnostic role (1, 4).

Grossly, MFB is a well-circumscribed, unencapsulated tumor with a rubbery to gelatinous white to yellow cut surface which shows no infiltration into the adjacent parenchyma. Usually, secondary degenerative changes are absent. On microscopy, the tumor shows spindle cells in fascicular pattern with intervening bundles of collagen. Small to medium-sized blood vessels are seen. Entrapped ducts and breast lobules are not seen. Interspersed adipose tissue lobules and mast cells may be present. A few morphological variants have been described besides classical type, including epithelioid, deciduoid, cellular, collagenized, lipomatous, myxoid and infiltrative. The differentials of MFB of the breast include fibromatosis, nodular fasciitis, PASH, solitary fibrous tumor, schwannoma, low grade sarcoma, invasive lobular carcinoma and metaplastic spindle cell carcinoma. To resolve this diagnostic quandary, IHC is essential. On IHC, the tumor cells show positivity for CD34 along with vimentin and desmin. IHC positivity for alpha SMA, CD10, ER, PgR and androgen receptor may also be noted. Cytokeratin, p63, EMA, CD117 and S100 protein are negative on IHC. The Ki-67 proliferation index tends to be low (4, 8).

Cytogenetic studies by fluorescent *in situ* hybridization have shown 13q14 deletion, loss of *RB1* and *FOXO-1* loci in MFB. This molecular profile has also been seen in spindle cell lipoma and few other entities, implying a close association between these lesions (2). In a case of MFB of left breast in a 70-year-old man, abrupt transition from MFB to an area with cellular atypia and increased mitosis, resembling sarcomatous transformation, has been recently described, highlighting the necessity for thorough evaluation and careful follow-up (9).

The appropriate treatment comprises of wide local excision without sentinel lymph node biopsy. Simple mastectomy is performed for larger masses, in masses with associated gynecomastia and in women. Follow-up of cases over 15–20 years has shown no distant metastasis. Following adequate excision of the tumor with clear margins obviates the need for any additional therapy, thus conferring a good long-term prognosis (10).

In conclusion, a diagnosis of MFB, though rare, should be considered with careful evaluation of the clinical and radiological features and confirmed by histopathological examination with relevant IHC markers. A possibility of malignancy should be excluded in a unilateral male breast mass. However, due to the benign nature of MFB and a good long-term prognosis, arriving at the correct diagnosis is crucial to avoid over-treatment, as surgical excision is curative in these cases.

Ethics

Informed Consent: Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Footnotes

Authorship Contributions

Surgical and Medical Practices: D.R.P.; Concept: V.N.G., P.A.E., B.T., T.Y., D.R.P.; Design: V.N.G., P.A.E.; Data Collection or Processing: V.N.G., P.A.E., B.T., T.Y., D.R.P.; Analysis or Interpretation: V.N.G., P.A.E., B.T., T.Y., D.R.P.; Literature Search: V.N.G., P.A.E.; Writing: V.N.G., P.A.E., B.T., T.Y., D.R.P.

Conflict of Interest: No conflict of interest was declared by the authors.

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