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Myofibroblastoma of the breast: A case report and literature review

Michael O. Tanimowo[1], *Ikwo J. Kudamnya*[1], *Emmanuel B. Etuk*[2]

[1]*Department of Histopathology, University of Uyo Teaching Hospital, Uyo, Akwa Ibom State, Nigeria*
[2]*Department of Surgery, University of Uyo Teaching Hospital, Uyo, Akwa Ibom State, Nigeria*

Abstract

Myofibroblastoma (MFB) of the breast is a rare benign mesenchymal tumour that can show morphological heterogeneity and occur in both sexes over a wide age range. It may present a diagnostic dilemma on radiology and cytomorphology where it can be confused with other benign and malignant breast lesions. Histology and immunohistochemistry are required to make accurate diagnosis of MFB. Surgical excision with long-term follow up is recommended as is being done for index patient. We present a case of MFB of the breast in a 48-year-old woman with a literature review.

Keywords: Breast, myofibroblastoma, histology, immunohistochemistry, mammography.

Introduction

Myofibroblastoma of the breast is a rare benign mesenchymal neoplasm that was first reported as a distinct entity by Wargotz in 1987 and has since been described in different anatomical locations including breast, soft tissue, lymph node and skin.[1,2] It may mimic 'suspicious for malignancy' lesion on imaging and gross appearance, which make diagnosis challenging for radiologists and surgeons.[2-4] Myofibroblastoma can also create diagnostic dilemma by fine needle aspiration cytology or core biopsy as pathologist will have to differentiate the lesion from other spindle-cell-like neoplasm.[4] Histology with immunohistochemistry (IHC) is essential for the accurate diagnosis of myofibroblastoma.[4,5] Characteristic features of MFB include the presence of spindle cells, collagen bands, rare or absent mitotic figures, as well as desmin/smooth muscle actin positivity and CD34 positivity on IHC.[4,5] We present a rare case of MFB of breast which was detected previously as Breast Imaging Reporting and Data System (BI-RADS) category 4C on mammography.

Corresponding Author: Dr. Michael Olatunde Tanimowo

Department of Histopathology,
University of Uyo Teaching Hospital,
Uyo, Akwa Ibom State, Nigeria
E-mail: tanimowomichael@yahoo.com, Phone: +2348060832394

Case summary

A 48-year-old woman presented with four (4) weeks history of painless left breast lump which was initially detected on self-breast examination. Physical examination revealed a mobile nontender soft to firm mass measuring 3x2cm located in the upper outer quadrant of the left breast. There was no palpably enlarged axillary lymph nodes. The mammogram revealed a fairly well-defined oval mass in the outer quadrant of the left breast without significant microcalcifications and classified as Breast Imaging Reporting and Data System (BI-RADS) 4C. Correlative ultrasonography showed an ill-defined, wider-than-tall mass measuring 7.8mm x 3.6mm in the upper outer quadrant of the left breast. Lumpectomy was planned while intraoperative frozen section facility was not available.

The received gross specimen at the Department of Histopathology comprised an irregularly shaped fibrofatty tissue that measures 9.0x6.5x2.5cm. Serial cut sections revealed a well circumscribed ovoid firm greyish-white to yellow mass measuring 3.0x2.0cm (Figure 1). Histologic sections of the breast mass showed fascicles of fairly uniform spindle cells traversed in areas by thick collagen bands (Figure 2). Mitotic figures and necrosis were

absent. The resection margins were uninvolved by tumour cells. On immunohistochemistry, the tumour cells expressed desmin (Figure 3), CD34 and smooth muscle actin (Figure 4) while S100 and pancytokeratin AE1/3 were both negative.

Sequel to the histologic features and immunohistochemical profile, a final diagnosis of mammary type MFB was made. The patient is presently on clinical follow-up and without tumour recurrence six months post-surgery.

Figure 1: Photograph of resected specimen showed a greyish white well circumscribed solid mass measuring 3cm maximum diameter in a background of fatty breast tissue.

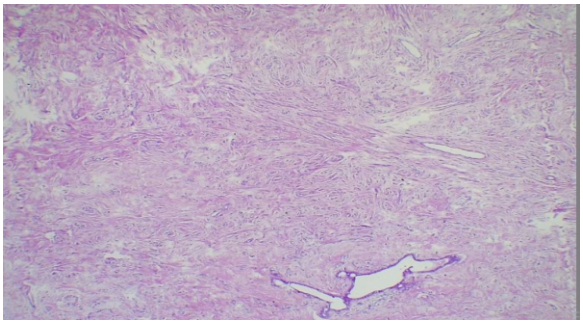

Figure 2: Photomicrograph showed fascicles of fairly uniform spindle cells in a background of collagenous stroma and dilated breast ducts. H&E staining. (× 4 magnification).

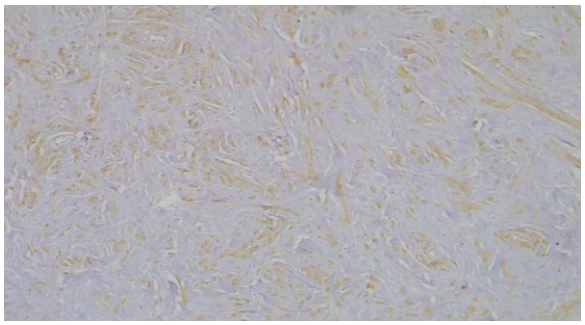

Figure 3: Photomicrograph showed immunoreactivity of the spindle cells for desmin by immunohistochemistry. (× 10 magnification).

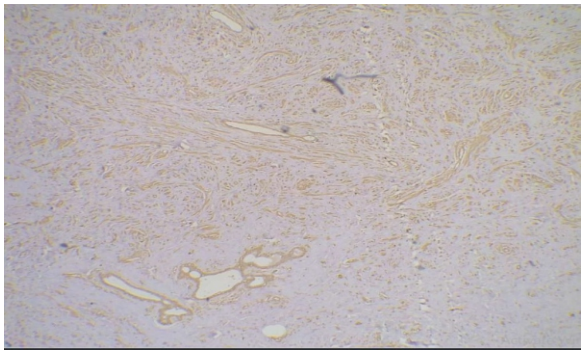

Figure 4: Photomicrograph showed immunoreactivity of the spindle cells for SMA by immunohistochemistry. (× 4 magnification).

Discussion

Myofibroblastoma is a rare benign un-encapsulated mesenchymal tumour that arise from myofibroblast cells which are normally found in the stroma of the mammary gland.[1-3] A five year review of soft tissue tumours of the breast including Phyllodes tumours in Ilorin, Nigeria, showed that only 2.5% of these lesions was myofibroblastoma.[6] A case of intranodal (retroperitoneal) MFB has also been reported in Morocco, North Africa.[7] The tumour is composed of bundles of spindle cells exhibiting myofibroblastic and myogenic differentiation.[2,3,5] First described by Wargotz in 1987,[1] MFB has been found to occur in both sexes equally and over a wide age range as well as in various anatomical locations with 10% and 9.7% occurring in the breast and intra-abdominal locations respectively.[2,8-10] The tumour usually presents as a slow-growing small mobile nontender mass measuring between 1 to 5cm in diameter although larger tumours have been reported.[2,8,11,12] The index patient is a woman in her 4th decade of life who presented with a painless mobile and non-tender tumour of 3cm in maximum diameter.

The imaging features of MFB are usually nonspecific with mammography typically showing a heterogenous well-defined tumour that is devoid of microcalcifications.[14] Likewise, tumours on ultrasonography are well-defined and display variable and mixed-echo pattern that is often classified as benign.[14] The above-mentioned imaging characteristics were in keeping with the

corresponding findings in the index patient. The mammography and correlational ultrasonography of the tumour in our patient specifically showed an oval fairly well-defined mass which was categorized as BI-RADS 4C. A BI-RADS 4C lesion under the breast imaging-reporting and data system refers to a high level of suspicion for malignancy requiring biopsy.[14]

Several morphologic variants of MFB have been reported some of which include epithelioid, cellular and lipomatous.[9,10,13,15] However our patient present with the classic variant of MFB. The diagnosis of this tumour by fine needle aspiration cytology (FNAC) and core biopsy is challenging and can be misleading, especially when dealing with a non-classic variant.[15,16] FNAC was not requested while facilities for intraoperative frozen section were presently not available in our hospital. Histologically, the prototypical type of MFB is a well demarcated tumour comprising of fascicles of uniform spindle cells that contain bland nuclei and admixed with bands of hyalinized collagen.[1,3-5] The absence of cytologic atypia, necrosis and mitotic figures further helps in confirming the benign nature of classic MFB.[1,3-5] All the aforementioned histologic features of classic MFB were observed in our patients' east lesion (Figure 2).

Immunohistochemistry (IHC) is necessary to confirm the diagnosis of MFB.[5,8] The tumour usually express myofibroblastic and myogenic markers including SMA, vimentin, desmin and CD34.[2,5,8,15] Moreover MFB can also be immunoreactive to estrogen receptor (ER), progesterone receptor (PR), androgen receptor (AR), CD99, B-cell lymphoma 2 (Bcl-2) and CD10 immunohistochemical markers but characteristically do not express pancytokeratin (AE1/3) or p63.[13,15,17,18] Furthermore, MFB typically display genetic rearrangement or deletion involving 13q[14] that results in the loss of retinoblastoma (Rb) expression by IHC.[8] Some differential diagnosis of classic MFB includes schwannoma and low-grade stromal sarcoma.[2,9,15] The absence of mitosis and necrosis effectively ruled out low-grade stromal sarcoma in this index case while the absence of nuclear palisading and negative expression to S100 ruled out schwannoma.[2,9,15] The index case showed strongly and diffusely positive expression for desmin and SMA (Figures 3 and 4). The tumour however was negative for S100 and AE1/3.

The clinical importance of MFB resides mainly in its prompt identification as a benign neoplasm and avoidance of inappropriate management decisions which may include extensive tumour resection and axillary clearance for a wrongly suspected malignancy.[19] The treatment of choice for MFB is complete local excision with free margins.[19] Although sentinel lymph node biopsy or specific adjuvant therapies are not indicated, long-term follow-up is strongly advised in other to avoid possible tumour reoccurence.[17,19]

Conclusion

Mammary MFB is a rare benign well circumscribed mesenchymal tumour of the breast which should always be included in the differential diagnosis of benign and malignant breast lesions. Although, patients can be screened for this tumour via FNAC or core biopsy; these techniques are however limited in the making of definitive diagnosis owing to small size and variant morphologies of this tumour. A definitive diagnosis relies on histology of excised tumour and immunohistochemistry. Since clinical, imaging and cytologic features of MFB can mimic malignancy or be misleading, it is suggested that pathologists should be aware of this entity to avoid misdiagnosis which could be costly.

Declaration of patient consent

The authors confirm that appropriate patient consent was obtained through a signed consent form. In the consent form, the patient has given her consent for her clinical information and corresponding images to be reported in the journal. The patient understand that her names and initials will not be published and efforts will be made to conceal her identity although absolute anonymity cannot be fully guaranteed.

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Conflicts of interest

There was no conflict of interest declared for this study.

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Institution of Research: University of Uyo Teaching Hospital, Uyo, Akwa Ibom State, Nigeria.

Authors' contributions: This work was carried out by all authors.
MOT designed the study, wrote the protocol and contributed to the literature searches.
IJK wrote the clinical case and the first draft of the manuscript.
EBE managed the analyses of the study and contributed to the literature searches.
All authors read and approved the final manuscript.

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