Myofibroblastoma of the Male Breast: A Case Report and Literature Review

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ABSTRACT

Myofibroblastoma of the breast is a rare benign tumor of the stromal breast tissue, which may be seen among postmenopausal female and older male patients. This paper describes one case of mammary myofibroblastoma in a male patient with typical histological features. Due to its diverse characteristics on imaging, myofibroblastoma poses a diagnostic dilemma among physicians, often necessitating histopathological analysis. Physicians should be aware of its varied appearances especially in the setting of an increased incidence of myofibroblastoma in recent years, likely due to the widespread increase in mammographic screening.

CASE REPORT

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An 80-year-old man presented for a CT of the chest for further evaluation of pulmonary nodules noted on an MRI of the left shoulder. He is otherwise a healthy man, although on medications for hypercholesterolemia. There is no family history of breast cancer.

The CT of the chest demonstrated a 1.6 cm right breast nodule for which bilateral diagnostic mammogram and right breast ultrasound were recommended (Figures 1,2). Digital mammography with tomosynthesis was performed in bilateral craniocaudal (CC) and mediolateral oblique (MLO) views. Mammographic findings were significant for a 16 mm oval mass with circumscribed margins in the upper inner breast, middle third depth (Figure 3). Ultrasonography demonstrated a 13 x 9 x 13 mm oval mass with indistinct margins with mixed echogenicity (Figure 4). Ultrasound guided biopsy was recommended for further evaluation.

Right breast ultrasound-guided biopsy revealed a spindle cell neoplasm consistent with myofibroblastoma. Immunohistochemical stains demonstrated a positive reaction of tumor cells for CD34, desmin, BCL 2, factor XIIIa, SMA, CD68, and a negative reaction for S100 and pankeratin. The proliferative fraction of tumor cells detected with Ki-67 was low (2-3%). The patient then underwent breast lumpectomy after needle localization. The postoperative course was unremarkable. Surgical pathology was performed, which also revealed the lesion to be positive for CD34 and desmin, and negative for cytokeratin and S100. The proliferation fraction detected with Ki-67 was low. Findings were again found to be consistent with myofibroblastoma (Figure 5).

DISCUSSION

Etiology & demographics

Mammary myofibroblastoma is among an exceedingly rare subset of breast tumors, accounting for less than 1% of all breast neoplasms [1]. The majority of reported cases have been recorded in middle aged to older individuals with a predilection in males and postmenopausal females [2]. Clinical manifestations of mammary myofibroblastoma often vary. Commonly, patients may present with a painless slow growing breast mass that is palpable on physical examination [3]. In this case, the tumor was discovered incidentally on a CT chest. Myofibroblastic neoplasms have been documented in many sites including the lung, axilla, meninges, lymph nodes, tunica testis, and tongue [4].

Histologically, myofibroblastoma is typically composed of spindle-cells arranged in fascicular clusters with interspersed bands of hyalinized collagen [5]. However, lipomatous, infiltrative, myxoid and epithelioid histopathological variants have been identified. Most tumors exhibit cellular expression markers including vimentin, CD34, and desmin [6]. Due to its many histological, immunohistochemical, and ultrastructural variations, myofibroblastoma poses differential diagnostic problems in breast imaging, with appearances that may mimic hamartoma or fibroadenoma.

Clinical & imaging findings (Differential Diagnoses)

The rarity of mammary myofibroblastoma in males may contribute to underdiagnosis or misclassification; its clinical and radiological features can overlap with other benign breast lesions such as fibroadenoma, leiomyoma, or neurofibroma. On mammography, they may present as a well defined mass. Under ultrasonography, mammary myofibroblastoma may present as a circumscribed, heterogeneous, and hypoechoic mass with posterior acoustic shadowing [7]. The aforementioned nonspecific features can also represent various breast lesions, emphasizing the challenge of establishing a diagnosis based solely on imaging findings.

Histopathological confirmation through core needle biopsy is necessary for a definitive diagnosis. Biopsies of mammary myofibroblastoma would show proliferating spindle shaped cells with myofibroblastic differentiation, forming a distinct pattern. However, diagnosing myofibroblastoma on a core biopsy can be notably challenging due to its histological overlap with other breast lesions. One of the primary complexities lies in distinguishing it from low-grade malignancies such as metaplastic carcinoma or malignant phyllodes tumor. These malignancies can share similar spindle cell features, making it essential to meticulously differentiate them to ensure appropriate management.

To achieve an accurate diagnosis, pathologists often need to use a panel of immunohistochemical stains. PanCK, also known as cytokeratin, is a common initial marker, though it is not sufficient on its own. Additional immunohistochemical markers such as CD34, CD99, and desmin also aid in verifying the diagnosis [5]. A comprehensive approach is essential in accurately ruling out low grade malignancies and ensuring a correct diagnosis. Cytokeratins such as CK5, CK5/6, and CK7 help in differentiating epithelial origins from other spindle cell lesions. The use of p63, a myoepithelial marker, further aids in ruling out metaplastic carcinoma, which often shows p63 positivity [8]. Caldesmon, a marker for smooth muscle differentiation, can assist in identifying myofibroblastic differentiation, which is characteristic of myofibroblastoma. This combination of markers helps build a more precise immunohistochemical profile, crucial for distinguishing myofibroblastoma from its malignant mimics [9].

Treatment & prognosis

The cornerstone of treatment remains surgical excision. In our case, as in many others, excision was pursued for therapeutic resolution. Postoperative follow up is essential to monitor for potential recurrence, although the overall recurrence rate is low [7]. The role of adjuvant therapies in mammary myofibroblastoma remains a subject of exploration. While these tumors often express estrogen and progesterone receptors, the efficacy of hormonal therapies is not well established [1]. The overall prognosis for mammary myofibroblastoma is favorable, with a low recurrence rate following surgical excision. Optimal duration and frequency of follow-up, especially in male patients, warrants further investigation given the limited data available.

AUTHORS' CONTRIBUTIONS

All authors contributed to this case report.

TEACHING POINT

The rarity of mammary myofibroblastoma may contribute to underdiagnosis or misclassification; its clinical and radiological features can overlap with other benign breast lesions such as fibroadenoma, leiomyoma, or neurofibroma. Histopathological confirmation through core needle biopsy is necessary for a definitive diagnosis.

QUESTIONS

Question 1: Myofibroblastoma of the breast can express which of the following cellular markers?

1. vimentin (applies)
2. CD44
3. CD68
4. CD113
5. CD20

Explanation for question 1: Most tumors exhibit cellular expression markers including vimentin, CD34, and desmin [6].

Question 2: True or False: Myofibroblastic neoplasms are solely found within the breast parenchyma.

1. True
2. False (Applies)

Explanation for question 2: Myofibroblastic neoplasms have been reported in many sites including the tongue, lymph nodes, meninges, axilla, tunica testis and lung [4].

Question 3: Microscopic features of myofibroblastoma are best described by which of the following?

1. High mitotic figures
2. Epithelial elements
3. Fascicles of spindle cells interrupted by broad bands of collagen (applies)
4. Adipocytes with a plexiform capillary network
5. None of the above

Explanation for question 3: Histologically, myofibroblastoma is typically composed of spindle-cells arranged in fascicular clusters with interspersed bands of hyalinized collagen [5].

Question 4: After establishing diagnosis of myofibroblastoma, what is the best next step?

1. No action needed
2. 3 Month Follow Up
3. 6 Month Follow Up
4. 1 Year Follow Up
5. Surgical Excision (applies)

Explanation for question 4: The cornerstone of treatment remains surgical excision.

Question 5: True or False: The prognosis of

MYOFIBROBLASTOMA FOLLOWING SURGICAL EXCISION IS FAVORABLE.

1. TRUE (APPLIES)
2. FALSE

Explanation for question 5: The overall prognosis for mammary myofibroblastoma is favorable, with a low recurrence rate following surgical excision.

REFERENCES

1. Scardina L, Franceschini G, Biondi E, et al. Myofibroblastoma of the breast: two case reports and literature review. *J Surg Case Rep.* 2021; 2021(4): rjab133. PMID: 33927867.
2. Khatib Y, Pandey V, Khade AL, Pandey R. Myofibroblastoma of the Breast: A Rare Cause of Breast Lump in a Postmenopausal Woman. *J Midlife Health.* 2018; 9(1): 47–49. PMID: 29628731.
3. Allahverdi TD, Allahverdi E. Myofibroblastoma. *J Breast Health.* 2017; 13(2): 100-102. PMID: 31244537.
4. Pina L, Apesteguía L, Cojo R, et al. Myofibroblastoma of male breast: report of three cases and review of the literature. *Eur Radiol.* 1997; 7(6): 931–934. PMID: 9228111.
5. Magro G. Mammary myofibroblastoma: a tumor with a wide morphologic spectrum. *Arch Pathol Lab Med.* 2008; 132(11): 1813-1820. PMID: 18976021.
6. Mele M, Jensen V, Wronecki A, Lelkaitis G. Myofibroblastoma of the breast: Case report and literature review. *Int J Surg Case Rep.* 2011; 2(6): 93-96. PMID: 22096693
7. Akrami M, Ebrahimian S, Safaei A, et al. A case report of a mammary myofibroblastoma in a male and literature review of radiologic and pathologic features of breast myofibroblastoma. *Clin Case Rep*. 2019; 7(10): 1968–1971. PMID: 31624619.
8. Ni Y, Tse GM. Spindle Cell Lesions of the Breast: A Diagnostic Algorithm. *Arch Pathol Lab Med*. 2023; 147(1): 30-37. PMID: 35976671.
9. Magro G, Gurrera A, Bisceglia M. H-caldesmon expression in myofibroblastoma of the breast: evidence supporting the distinction from leiomyoma. *Histopathology*. 2003; *42*(3): 233–238. PMID: 12605642.
10. Scardina L, Franceschini G, Biondi E, et al. Myofibroblastoma of the breast: two case reports and literature review. *J Surg Case Rep.* 2021; 2021(4): rjab133. PMID: 33927867.
11. Strait AM, Linos K, Tafe LJ, Muller KE. A novel case of mammary-type myofibroblastoma with sarcomatous features. *Int J Surg Pathol.* 2021; 29(3): 308-313. PMID: 32752900.
12. Ali S, Teichberg S, DeRisi DC, Urmacher C. Giant myofibroblastoma of the male breast. *Am J Surg Pathol.* 1994; 18(11): 1170-1176. PMID: 7943539.

FIGURES

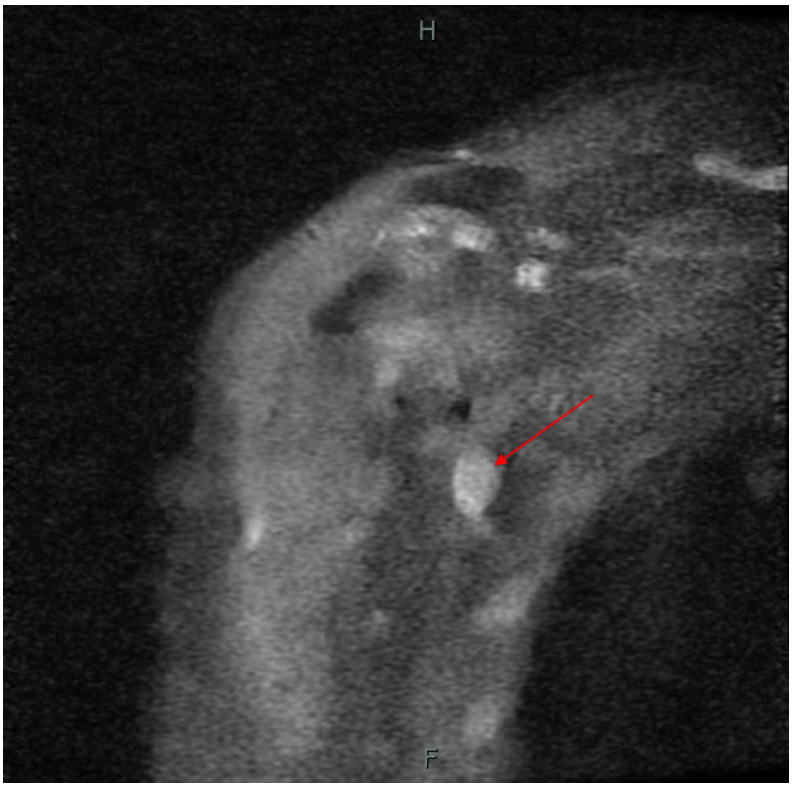


Figure 1: Post-contrast MRI of the chest coronal demonstrating incidental breast nodule with enhancement

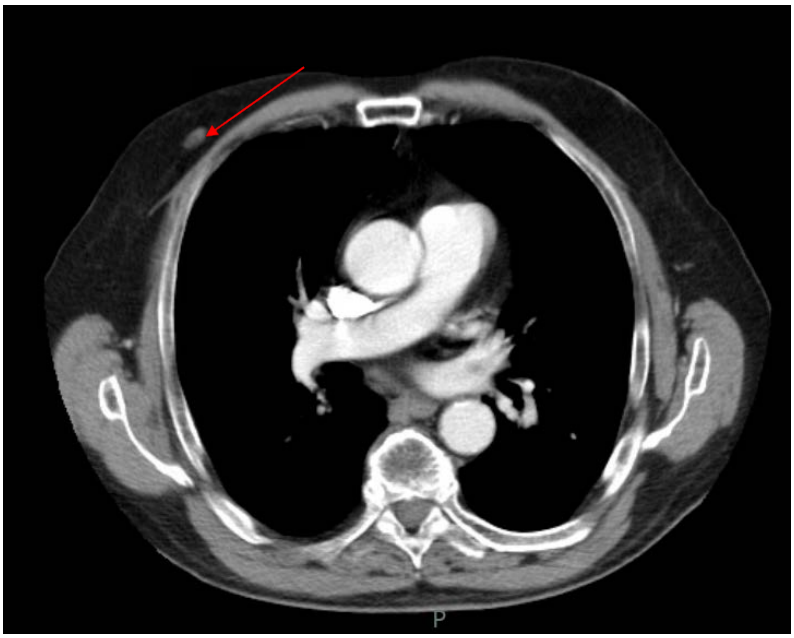


Figure 2: Axial contrast enhanced CT of the chest in the venous phase demonstrates a 1.6 cm right breast nodule.

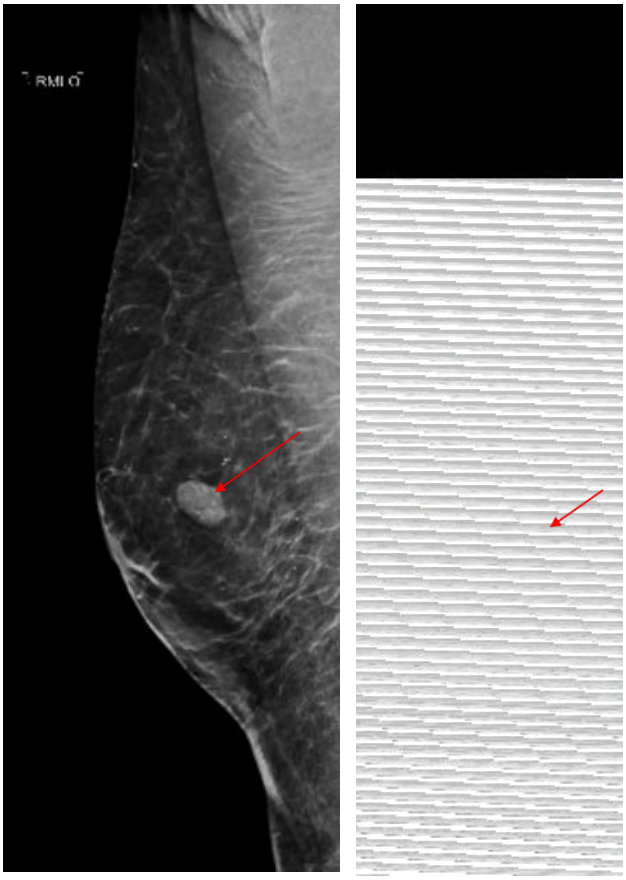


Figure 3: Digital mammography in mediolateral oblique (MLO) and craniocaudal (CC) views demonstrates a 16 mm oval mass with circumscribed margins in the upper inner breast, middle third depth.

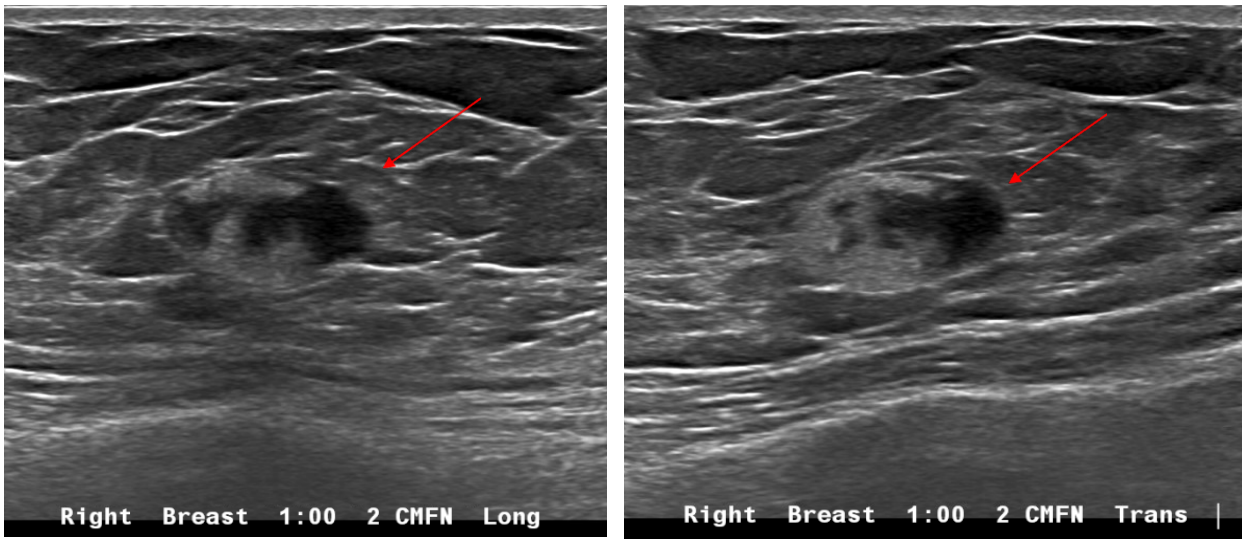
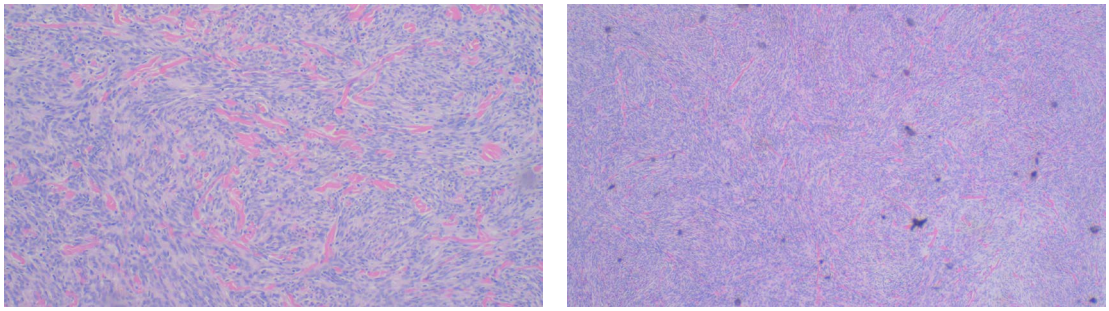


Figure 4: Ultrasound of the breast in long and transverse views demonstrates a 13 x 9 x 13 mm oval mass with indistinct margins with mixed echogenicity.



5a **5b**

Figure 5: Histological examination of right breast mass from surgical lumpectomy in H&E stain revealing spindle cell neoplasm consistent with myofibroblastoma.

Table 1: Literature review of myofibroblastoma of the male breast

Article	Age	Gender	Presentation	Management
Scardina et al., 2021 [12] [10]	56	Male	Lump in mammary region	Complete excision with overlaying skin, preserving the nipple
Strait et al., 2021 [13] [11]	70	Male	Persistent cough (incidental)	Surgical excision
Akrami et al., 2019 [8] [7]	65	Male	Breast mass	Modified radical mastectomy
Ali et al., 1994 [10] [12]	83	Male	Breast mass	Mastectomy
Pina et al., 1996 [9] [4]	47, 43, 60	Male	Palpable breast mass	Surgical excision

KEYWORDS

Myofibroblastoma; Breast; Mammography; Spindle Cell Tumor; Mesenchymal Tumor