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Case Report RADIOLOGY

Sonoelastography findings of myofibroblastoma

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ABSTRACT

Myofibrolastoma of the breast (MFB) is a rare and benign stromal tumor. Although MFB is a benign entity, in radiologic evaluation, there is no specific diagnostic feature. Conventional breast imaging findings have been published before. Sonoelastography has been used as an imaging method that allows us to evaluate tissue stiffness *in vivo* and increases the specificity of B-mode ultrasonography in the discrimination of benign-malignant lesions. In this case report, it was shown that MFB is of high stiffness in shear wave elastography (SWE) evaluation. SWE findings of MFB, which is a benign lesion, have been described for the first time in the literature.

Keywords: Breast; myofibroblastoma; ultrasonography.

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Myofibrolastoma of the breast (MFB) is a rare, benign stromal tumor characterized by bland spindle cells, growing in collagen bands and fat-containing fascicles, with different subtypes histopathologically described. MFB is a sporadic tumor with a prevalence of <1% of all breast tumors. It is more common in postmenopausal women and middle-aged to older men [1]. Although its etiology has not been fully established; cases with a history of steroid hormone use, gynecomastia, chest trauma, and scar have been reported in the literature [2].

Although MFB is a benign entity, in radiologic evaluation, there is no specific diagnostic feature. In addition, it is mostly classified as possible malignant lesions (Breast Imaging and Reporting Data System-BI-RADS 4A) with their imaging findings. Conventional breast imaging methods, including mammography (MG), ultrasonography (US), and magnetic resonance imaging findings, have been published in the literature before [3]. However, as mentioned above, as there is no specific imaging feature, for exact diagnosis, the patients with these lesions are redirected to biopsy for final diagnosis.

Sonoelastography (SE) is an imaging method that allows us to evaluate tissue stiffness *in vivo*. The first of the SE techniques based on different application bases is strain elastography using internal or external compression stimuli, and the second is shear wave elastography (SWE) imaging obtained by acoustic radiation force stimulation created by the ultrasound device. Lesion stiffness in SWE is in the form of objective quantitative data that can be measured by the speed of the shear wave obtained from the tissue. Shear wave velocity is measured in units of elasticity (m/s) or Young's modulus-elasticity (kPa). Although there is no consensus on the cutoff value for malignant-benign discrimination, in the literature, there are different results that have been reported valuable results in distinguishing malignant and benign lesions using SWE [4–6].

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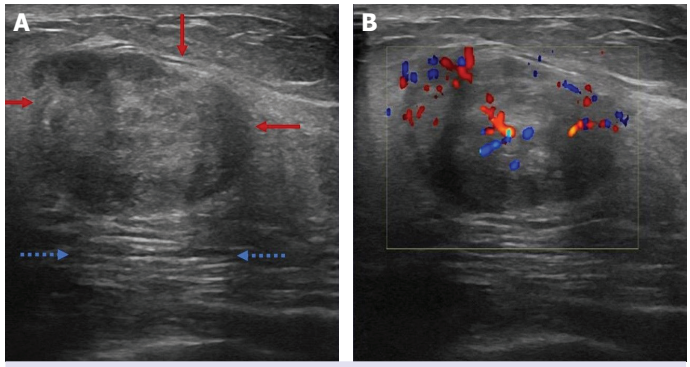


FIGURE 1. **(A)** B-mod ultrasonography: the lesion was detected as a well-defined, oval-shaped, hypoechoic mass (red arrows) with slight posterior enhancement (dashed blue arrows) and measured 18 × 20 × 24 mm. **(B)** Colour Doppler US examination revealed vascularity in the lesion.

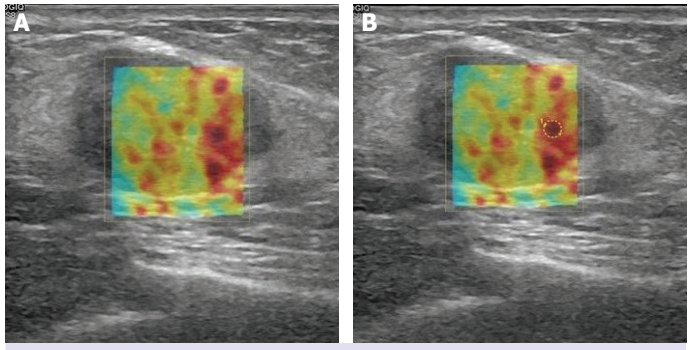


FIGURE 2. **(A)** In the color coded elastogram of the lesion region, it was observed that there was a blue, yellow, and red (hard) mosaic pattern. **(B)** Shear wave elastography: The elasticity score is measured as 7,04 m/s-146,48kPa.

In this case report, we aimed to present the SWE findings of MFB. To the best of our best knowledge, this is the first case presenting SWE findings of MFB in the published literature.

CASE REPORT

The patient's written and informed consent for publication of US data was obtained for the present case report.

A 67-year-old male patient was admitted with a history of a slowly growing, painless mass in the upper outer quadrant of the left breast for 4 months. No known history of the disease was found in the anamnesis of the patient, and there was no family history of cancer. In the US examination, a heterogeneous, well-circumscribed, hypoechoic, and oval-shaped lesion was detected. The mass measured at 15 × 20 × 25 mm in the upper outer quadrant of the left breast showed posterior acoustic enhancement (Fig. 1A). Color Doppler US examination revealed increased vascularity in the lesion (Fig. 1B). Thereupon, a SE examination was performed on the lesion. In the color coded elastogram of the lesion region, it was observed that there was a blue (soft), yellow, and red (hard) mosaic pattern (Fig. 2A). In SWE, the highest elasticity value in the lesion was 7.04 m/s-146.48 kPa (Fig. 2B). The histopathology diagnosis of the lesion was reported as MFB (Fig. 3).

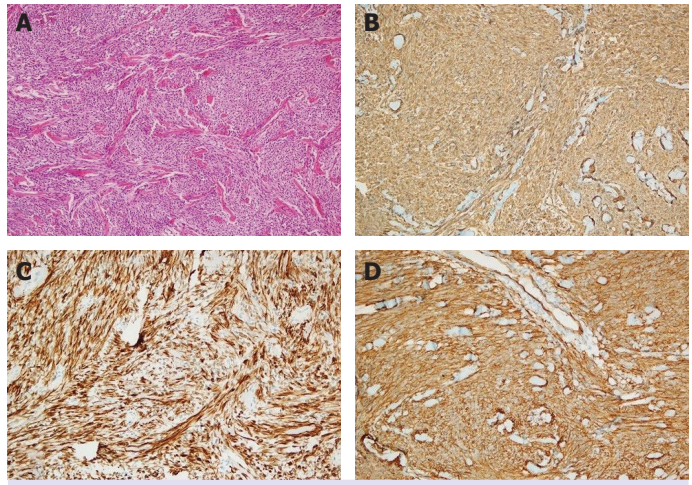


FIGURE 3. The tumour shows uniform spindle cells growing in fascicles with intervening bands of ropey collagen **(A)** H&E, ×100). In immunohistochemical analysis, the tumor cells show diffuse and robust positive staining [**(B)** vimentin, **(C)** desmin, and **(D)** CD34 (×200)].

DISCUSSION

MFB is a benign mesenchymal entity defined by Wargotz et al. [7] in 1987, and it is reported as a small number of case reports in the literature. Histologically, MFB is characterized by spindle-shaped cells growing in collagen bands and fat-containing fascicles, derived from fibroblasts. CD34, CD10, desmin, SMA, and vimentin are positive in the immunohistochemical analysis, which facilitates the final diagnosis of MFB [8].

Since MFB is a rare disease, there are few numbers of articles reporting the radiological features of this disease in the literature. MFB is seen in MG as a solitary, circumscribed, oval, and hyperdense mass [9]. In the B-mode US, it is distinguished as well-defined, hypoechoic, round to oval, and mass. In terms of radiological imaging findings, fibroadenoma, hamartoma, pseudoangiomatous stromal hyperplasia, and phyllodes tumor should be

considered in the differential diagnosis of MFB [10]. The lesions are usually diagnosed histopathologically due to the lack of specific imaging findings of the lesion.

B-mode US has a high sensitivity in lesion detection and its specificity is relatively lower in the differential diagnosis of lesions. SE is a new technic that provides a prominent contribution to the discrimination of benign and malignant lesions. In a meta-analysis study, SWE added to B-mode US significantly increased specificity in the differentiation of malignant and benign lesions [11]. In strain elastography, the lesion includes a blue (soft), yellow, and red (hard) mosaic pattern on the elastography map. In a study conducted by Barr and Zhang [6], the cutoff elasticity value for the highest sensitivity and specificity in SWE was 4.5 m/s. Lee et al. [12] graded elasticity scores into three categories: 72 kPa or lower, soft as negative; 72–108 kPa, moderate as equivocal; and 108 kPa or higher, stiffer. In SWE, the highest elasticity value in this lesion was compatible with high stiffness levels. This result was explained by the fact that the lesion had different components at high degrees of stiffness such as collagen tissue and increased spindle cells.

It is useful to use SWE in patients with suspicious findings. However, B-mode US findings do not have prominent malignant criteria. Using B mode US and SWE findings together can lead to a shift in classification from BI-RADS 3 to BI-RADS 2 or 4 [13, 14]. This issue is important because it may cause significant changes in the patient's treatment process.

There are false-positive and false-negative results of US elastography depending on the application technique, breast tissue thickness, the structure of surrounded tissue, lesion size, and histologic features [15]. Malignant lesions with soft-tissue structure, ductal carcinoma in situ, mucinous carcinoma, and necrotic tumors have less stiffness than other malignant tumors.

MFB is a rare benign diagnosis. In radiologic evaluation, there is no prominent imaging finding and commonly diagnosed as a possible malignant lesion. SE findings for MFB are rather limited. To the best of our knowledge, SWE findings of MFB tumors have not been reported in the published literature.

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

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

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REFERENCES

1. Schickman R, Leibman AJ, Handa P, Kornmehl A, Abadi M. Mesenchymal breast lesions. Clin Radiol 2015;70:567–75.
2. Howitt BE, Fletcher CD. Mammary-type myofibroblastoma: Clinicopathologic characterization in a series of 143 cases. Am J Surg Pathol 2016;40:361–7.
3. Lee EJ, Chang YW, Jin YM, Kim NW. Multimodality images of myofibroblastoma in the male breast: a case report and a review of the literature. Clin Imaging 2018;51:300–6.
4. Gkali CA, Chalazonitis AN, Feida E, Sotiropoulou M, Giannos A, Tsigginou A, et al. Breast elastography: how we do it. Ultrasound Q 2015;31:255–61.
5. Athanasiou A, Tardivon A, Tanter M, Sigal-Zafrani B, Bercoff J, Deffieux T, et al. Breast lesions: quantitative elastography with supersonic shear imaging-preliminary results. Radiology 2010;256:297–303.
6. Barr RG, Zhang Z. Shear-wave elastography of the breast: value of a quality measure and comparison with strain elastography. Radiology 2015;275:45–53.
7. Wargotz ES, Weiss SW, Norris HJ. Myofibroblastoma of the breast. Sixteen cases of a distinctive benign mesenchymal tumor. Am J Surg Pathol 1987;11:493–502.
8. D'Alfonso TM, Subramaniyam S, Ginter PS, Mosquera JM, MacDonald TY, Noorzad Z, et al. Characterization of the leiomyomatous variant of myofibroblastoma: a rare subset distinct from other smooth muscle tumors of the breast. Hum Pathol 2016;58:54–61.
9. Jung HK, Son JH, Kim WG. Myofibroblastoma of the breast in postmenopausal women: Two case reports with imaging findings and review of the literature. J Clin Ultrasound 2020;48:279–82.
10. Allahverdi TD, Allahverdi E. Myofibroblastoma. J Breast Health 2017;13:100–2.
11. Tanter M, Bercoff J, Athanasiou A, Deffieux T, Gennisson JL, Montaldo G, et al. Quantitative assessment of breast lesion viscoelasticity: initial clinical results using supersonic shear imaging. Ultrasound Med Biol 2008;34:1373–86.
12. Lee SH, Chang JM, Cho N, Koo HR, Yi A, Kim SJ, et al; Korean Breast Elastography Study Group. Practice guideline for the performance of breast ultrasound elastography. Ultrasonography 2014;33:3–10.
13. Klotz T, Boussion V, Kwiatkowski F, Dieu-de Fraissinette V, Bailly-Glatre A, Lemery S, et al. Shear wave elastography contribution in ultrasound diagnosis management of breast lesions. Diagn Interv Imaging 2014;95:813–24.
14. Cho N, Lim J, Moon WK. Usefulness of ultrasound elastography in reducing the number of Breast Imaging Reporting and Data System category 3 lesions on ultrasonography. Ultrasonography 2014;33:98–104.
15. Chang JM, Moon WK, Cho N, Kim SJ. Breast mass evaluation: factors influencing the quality of US elastography. Radiology 2011;259:59–64.