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## CASE REPORT

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# Mimicker of Breast Cancer: Mammary Fibromatosis

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### ABSTRACT

*Mammary fibromatosis is a rare benign lesion of the breast with clinical and radiological manifestations mimicking breast cancer. We present a woman with fibromatosis illustrating the clinical and radiological presentation, and the pathological findings. The potential differentiating features are discussed.*

*Key Words: Breast neoplasms; Fibroadenoma; Mammography; Ultrasonography*

## 中文摘要

### 疑似乳腺癌：乳腺纖維瘤病

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乳腺纖維瘤病是一種罕見的乳房良性病變，其臨床和影像學表現與乳腺癌相似。本文報告一例女性乳腺纖維瘤病患者，介紹其臨床和影像學表現以及病理學結果，並討論其與乳腺癌鑒別時可能存在的不同表現。

### INTRODUCTION

Mammary fibromatosis, also known as desmoid tumour of the breast, is a very rare lesion constituting less than 0.2% of all breast tumours.<sup>1</sup> This entity generally occurs in women, but has also been reported in men.<sup>2</sup> Mammary fibromatosis is a histologically benign, but locally aggressive, lesion. The clinical and radiological manifestations of breast fibromatosis are almost indistinguishable from those of a malignant breast tumour. We present a Chinese woman with mammary fibromatosis.

### CASE REPORT

In March 2013, a 70-year-old woman presented with a self-palpable right breast mass. She had no history of breast disease or operation, but had a history of hypertension. She was referred to the breast clinic for assessment. On physical examination, there was a 1-cm firm mass in the right breast in the 8 o'clock position, 4 cm from the nipple. There was skin tethering. No axillary lymph nodes were palpable. No other breast mass was detected. She was referred for further examination with breast imaging.

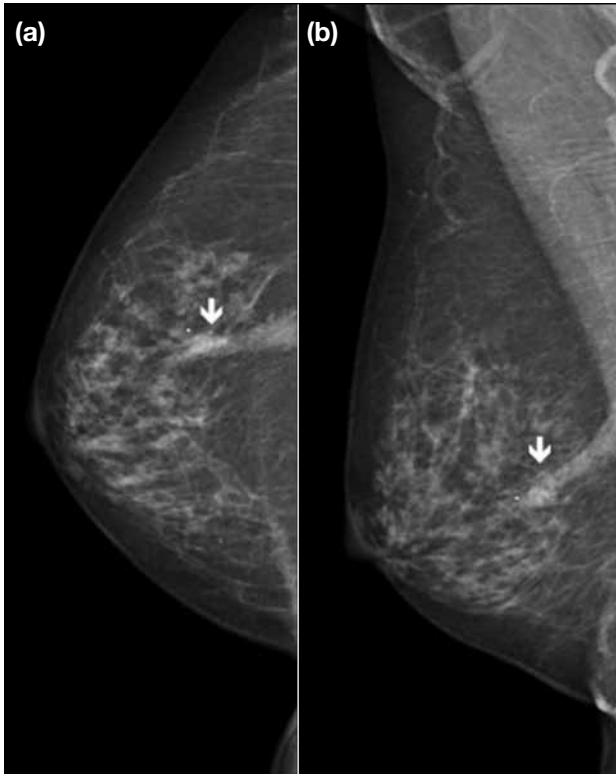
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Bilateral mammograms showed a high-density mass in the lower outer quadrant of the right breast, with a partially spiculated border and partially obscured border (Figure 1). The mass measured approximately



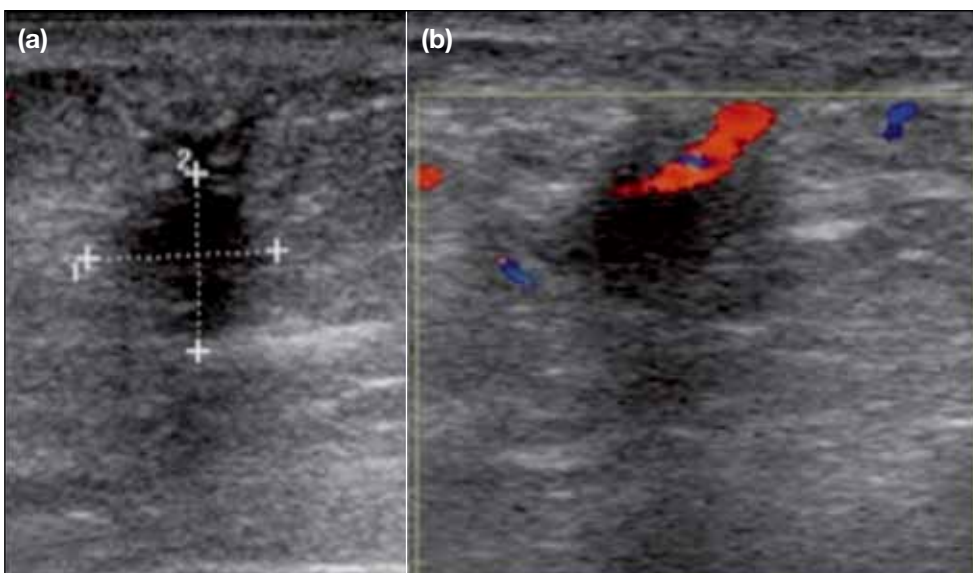
**Figure 1.** Mammography images of the patient with mammary fibromatosis. (a) Craniocaudal and (b) mediolateral oblique views of the right breast show a medium-to-high-density mass with indistinct border (arrows). A high-density band is seen extending posteriorly from the mass to involve the pectoralis muscle.

1 cm in size. There was no associated calcification. At the deep border of the mass, there was a band of high-density tissue extending to the pectoralis muscle. There was no nipple retraction, abnormal skin thickening, or enlarged axillary lymph nodes. No focal lesion was detected in the left breast. Ultrasound examination of the breast showed an ill-defined irregular hypoechoic lesion in the right breast in the 8 o'clock position, 4 cm from nipple (Figure 2). The lesion showed a spiculated border and mild increased internal vascularity. There was also mild posterior acoustic shadowing. The imaging findings were highly suspicious of a malignant lesion, corresponding to Breast Imaging-Reporting and Data System category 5. Ultrasound-guided core biopsy was performed. The biopsy showed bland spindle cell proliferation without mitotic activity or evidence of carcinoma. In view of the clinically and radiologically suspicious lesion, wide local excision was performed. The surgical specimen revealed bland-looking spindle cell proliferation, with infiltration of skeletal muscle and subcutis of the skin. The anterior margin and deep margin of the specimen were involved. The specimen was positive for beta-catenin and negative for brain-type creatine kinase, p63, or CD34. The findings were consistent with breast fibromatosis.

The patient was followed up clinically for 1 year. There was no evidence of a breast mass or recurrence. She remained well.

## DISCUSSION

Fibromatosis can be seen in many locations in the



**Figure 2.** Ultrasound images of the lesion in the right breast in the 8 o'clock position. (a) A grey-scale image shows an ill-defined hypoechoic mass with indistinct border and posterior acoustic shadowing, and (b) a Doppler image shows increased internal vascularity of the lesion. The ultrasonographic features are highly suspicious of a malignant tumour.

body, and is classified as intra-abdominal, within the abdominal wall, and extra-abdominal elsewhere in the body.<sup>3</sup> Mammary fibromatosis is a type of extra-abdominal desmoid tumour, which is a benign stromal lesion of the breast. Mammary fibromatosis demonstrates fibroblastic and myofibroblastic proliferation, with an infiltrative growth pattern with no metastasising potential.<sup>4</sup> The median age of patients is reported to be 45 years, with a female predominance,<sup>5</sup> and is rarely seen in men.<sup>6-8</sup> The aetiology of this condition is unknown. Although previously reported in patients with Gardner's syndrome with multiple desmoid tumours,<sup>9</sup> mammary fibromatosis is only very rarely seen. Up to 44% of patients had a history of surgical trauma in Neuman et al's series,<sup>5</sup> including previous breast augmentation surgery.<sup>10,11</sup> Most patients had no known cause identified, as for this patient.

Clinically, desmoid tumour of the breast presents as a firm or hard mass, with or without skin retraction, and is suspicious of malignancy. The radiological features are indistinguishable from malignancy. Because of its locally aggressive and infiltrative nature, mammary fibromatosis is often seen as a mass with an irregular, spiculated border on mammography, sometimes with associated pectoralis muscle involvement, as in this patient. On ultrasonography, mammary fibromatosis is shown as an ill-defined hypoechoic mass with a spiculated border. Architectural distortion may also be seen. These imaging features are essentially not differentiable from malignancy.<sup>12,13</sup> There are only limited reports on the magnetic resonance imaging (MRI) features of mammary fibromatosis. There is variable signal. High T2 signal reflects myxoid tissue and low T2 signal reflects fibrotic tissue.<sup>2</sup> Mammary fibromatosis also demonstrates a variable enhancement pattern.<sup>14-16</sup> MRI potentially serves as a tool to detect recurrent fibromatosis and may correlate with the histological grading of fibromatosis,<sup>15</sup> but there are no characteristic features yet to diagnose this condition.

In this patient, we noted a well-defined high-density band of tissue extending to the chest wall on the mammogram on both mediolateral oblique and craniocaudal views (Figure 1). A similar mammographic finding was observed in a reported case of breast fibromatosis,<sup>17</sup> where there was a shorter band of tissue extending to the chest wall. The tissue band is an unusual feature that is not observed in invasive breast cancer, in which chest wall invasion is commonly seen as an irregular spiculated area close to the tumour.

In addition, breast fibromatosis is rarely associated with calcifications.<sup>18</sup> The combination of these two features may potentially serve as differentiating features, although it is crucial to exclude a malignant lesion with biopsy.

Biopsy of the lesion may provide a hint to the diagnosis of this lesion. In this patient, the biopsy specimen revealed a bland spindle cell lesion without mitotic activity or epithelial cells. The differential diagnoses for a bland spindle cell lesion include fibromatosis, fibromatosis-like metaplastic carcinoma, and dermatofibrosarcoma protuberance.<sup>19</sup> For a diagnosis of breast fibromatosis, careful histological assessment of the surgical specimen and the use of immunohistochemical staining would be needed. The presence of beta-catenin, a marker for fibromatosis, and the absence of malignancy, are diagnostic of the condition.

The optimal management of mammary fibromatosis is still controversial due to the rarity of the disease. The recommended primary treatment is complete surgical excision.<sup>5</sup> A recurrence rate of up to 29% has been reported, with a higher rate in patients with positive margins.<sup>5</sup> Other treatment options such as hormonal therapy, cytotoxic agents, and radiotherapy for breast fibromatosis are still being investigated with variable results.<sup>5,13</sup> There is a recent report demonstrating the response of breast fibromatosis to tamoxifen in a 29-year-old woman.<sup>20</sup> In patients for whom surgical resection is not feasible, pharmacological agents may be considered an alternative therapy.

In summary, we present a rare case of breast fibromatosis in an elderly patient. The clinical and radiological features are essentially indistinguishable from malignancy. The correct diagnosis may be made with biopsy with the finding of bland spindle cells, while the presence of a band-like tissue extending to the chest wall and absence of calcifications may potentially serve as differentiating features from malignancy. The final diagnosis can only be confirmed with surgical excision.

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