

Benign Mesenchymal Breast Tumours – A Series of 39 Cases

Tumores Mesenquimatosos Benignos da Mama – Uma Série de 39 Casos

Inês Dias Marques¹, António Guimarães dos Santos², Ana Teresa Aguiar²

¹ Interna de Radiologia no Serviço de Imagiologia do Centro Hospitalar de Vila Nova de Gaia/Espinho, Vila Nova de Gaia, Portugal
² Radiologista no Serviço de Radiologia do Instituto Português de Oncologia do Porto FG, EPE, Porto, Portugal

Correspondência

Inês Dias Marques
Serviço de Imagiologia
Centro Hospitalar de Vila Nova de Gaia/
Espinho
Rua Conceição Fernandes
4434-502 Vila Nova de Gaia
Portugal
email: inesdiasmarques@gmail.com

Abstract

Mesenchymal breast tumours arise in the stroma of the breast and comprise benign, malignant and tumour-like lesions composed mainly of mesenchymal cells. We found 39 lesions that were classified as benign mesenchymal breast tumours from January 2010 until July 2014 and that met our criteria. They include haemangioma, pseudoangiomatous stromal hyperplasia (PASH), myofibroblastoma, desmoid-type fibromatosis, angioliipoma and granular cell tumour. Although our series does not reflect the general population because it is based at an oncologic referral center, it allows us to describe some rare lesions in their typical and unusual presentations. We define their imaging appearances and provide a short review of the literature, including imaging features and management. Despite their variable appearance, the radiologist must be familiar with these entities to provide the best care regarding the decision to maintain imaging follow up or the need for excision.

Keywords

Breast diseases; Breast neoplasms;
Mammography; Breast ultrasound.

Resumo

Os tumores mesenquimatosos da mama originam-se do estroma mamário e incluem lesões benignas, malignas e pseudotumorais compostas principalmente por células mesenquimatosas. Encontrámos 39 lesões mamárias classificadas como tumores mesenquimatosos benignos entre Janeiro de 2010 e Julho de 2014 e que preenchiam os nossos requisitos. Entre elas incluem-se hemangioma, hiperplasia estromal pseudoangiomatosa (PASH), miofibroblastoma, fibromatose (tipo desmóide), angioliipoma e tumor de células granulares. Apesar desta série não ser um reflexo da população geral, uma vez que está baseada num centro de referência oncológico, permite-nos mostrar lesões raras nas suas apresentações habituais e atípicas. Descrevemos os nossos achados e realizamos uma breve revisão da literatura, incluindo aspectos imagiológicos e orientação. Apesar do seu aspecto imagiológico variável, o radiologista dedicado a patologia mamária deve estar familiarizado com estas lesões para poder oferecer o melhor cuidado e orientação na decisão entre seguimento ou necessidade de excisão.

Palavras-chave

Doenças mamárias; Neoplasias da mama;
Mamografia; Ecografia mamária.

Introduction

Mesenchymal breast tumours arise in the stroma of the breast. Their latest classification was revised and published by the WHO in 2012, and comprises benign, malignant and tumour-like lesions composed mainly of mesenchymal cells (Table 1).¹ It incorporates lesions of fibro-epithelial, fibroblastic and myoblastic, vascular, lipomatous, neural, myogenic, and osseous origin.² While some of these tumours are fairly common, most of them are uncommon and their imaging appearance is rarely portrayed in the literature. We aim to describe the imaging findings present in our series and provide a short summary of their features and management.

Materials and Methods

We searched for lesions that were pathologically labelled as benign mesenchymal breast tumours according to the 2012 WHO classification, from January 2010 until July 2014 at Instituto Português de Oncologia do Porto. Afterwards, we

Table 1 – WHO Classification of Mesenchymal Breast Tumours (2012).¹

Nodular fasciitis
Benign vascular lesions
Pseudoangiomatous stromal hyperplasia
Myofibroblastoma
Desmoid-type fibromatosis
Inflammatory myofibroblastic tumour
Lipoma
Granular cell tumour and benign peripheral nerve-sheath tumour
Angiosarcoma
Liposarcoma
Rhabdomyosarcoma
Osteosarcoma
Leiomyoma and Leiomyosarcoma

retrospectively reviewed their imaging appearances on ultrasound and mammography and complemented the results with a brief review of the literature for each lesion.

Results

We found 50 lesions (49 patients) that were classified as benign mesenchymal breast tumours according to our criteria. Eight lesions were excluded because images were not available and 3 others because PASH was a secondary finding (Table 2). We retrospectively reviewed the records of these patients, and described the imaging findings on ultrasound and mammography. (Table 3 – Appendix).

Table 2 – Results - Histologic subtypes found in our series.

	Lesions	Sex (F/M)	Excluded	Included
Haemangioma	3	3/0	0	3
PASH	30	30/0	5	25
Myofibroblastoma	2	2/0	0	2
Desmoid-type fibromatosis	6	5/1	2	4
Lipoma	1	1/0	1	0
Angiolipoma	4	3/0	2	2
Granular cell tumour	4	3/1	1	3

Discussion

Our results are based in a referral oncologic centre; while some of the lesions were the reason for referral, others were incidental findings in the imaging workup of oncologic patients. Besides, some studies were done in outpatient care and the images were not available. So, although our series has to be interpreted in its context and does not reflect the general population, it allows us to describe the imaging appearances of some rare tumours and uncommon imaging features of more frequent lesions.

Haemangioma

Haemangiomas are a benign proliferation of mature vessels. According to the WHO, the finding of a haemangioma in core biopsy specimens should prompt surgical excision to exclude well-differentiated angiosarcoma.¹ However, in clinical practice, masses with classic imaging and pathologic features are often followed up with imaging.³ The three

hemangiomas (Fig 1) in our series were masses in superficial location, faintly seen on ultrasound, whose margins ranged from circumscribed to microlobulated on ultrasound and mammography. None of our hemangiomas showed calcifications. These findings are in concordance with the literature.⁴ In our series only one was excised, due to discrete atypia.

Pseudoangiomatous stromal hyperplasia (PASH)

PASH is defined as a benign lesion comprising stromal myofibroblastic proliferation and having the appearance of anastomosing slit-like pseudovascular spaces lined by spindle-shaped cells. It must be histologically distinguished from angiosarcoma and might resemble myofibroblastoma¹. PASH is especially frequent in premenopausal women or women taking hormone therapy. Although most often stable over time, it may increase in size or recur.⁵ It is a common incidental finding in breast biopsies but its nodular form is rare.

We examined the imaging appearances of cases where PASH was considered a primary finding. From 25 lesions in our series, 3 were occult on ultrasound and 7 were occult on mammography (mammograms were not available in 8 patients). Most masses were hypoechoic with circumscribed or microlobulated margins but there were 2 cases of masses with indistinct margins and posterior shadowing (Fig 2). We also found 4 cases of architectural distortion without a clear mass on ultrasound. Mammogram findings were nonspecific, including masses with circumscribed, obscured or indistinct margins. Pathologically, most cases were defined solely as PASH, one case was categorized as nodular PASH (Fig 3), four cases were categorized as either nodular PASH or fibroadenoma with superimposed PASH, and there was one case where a differential diagnosis between PASH and myofibroblastoma could not be made.

Myofibroblastoma

Myofibroblastomas are benign tumours of the mammary stroma composed of fibroblasts and myofibroblasts.¹ Unfortunately, there are several unusual morphologic variants that might be difficult to correctly diagnose on core biopsy. While initially described in older men, they have been increasingly recognized in postmenopausal women, probably due to screening.⁶ They do not have a tendency for local recurrence.¹ In the literature they are described as well circumscribed, homogeneous, hypoechoic masses on ultrasound, commonly evocative of fibroadenomas, whereas

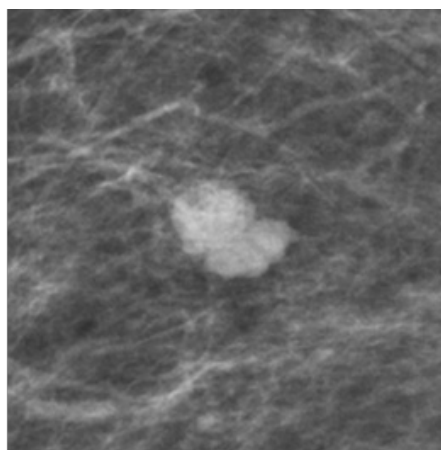
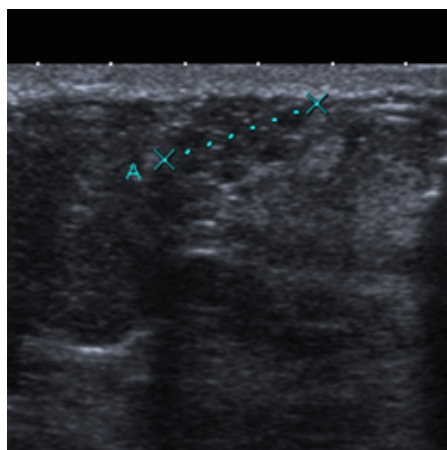


Figure 1 – Haemangioma.

Subcutaneous, oval, hypoechoic mass with microlobulated margins, seen as a mass with microlobulated margins on mammography.

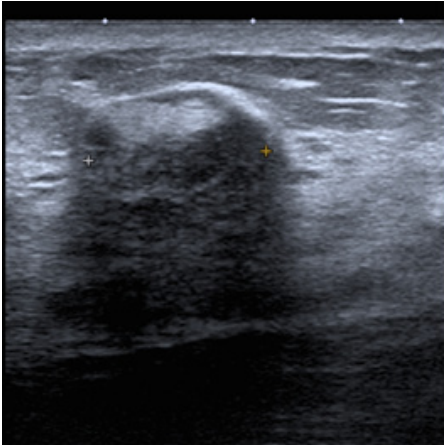


Figure 2 – PASH. Irregular mass with heterogeneous echo pattern, indistinct margins and posterior shadowing. On mammography a subtle round mass with obscured margins can be seen. These imaging findings are atypical for PASH.

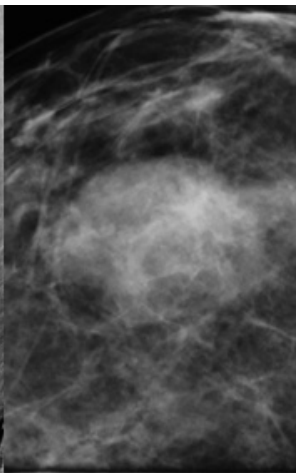
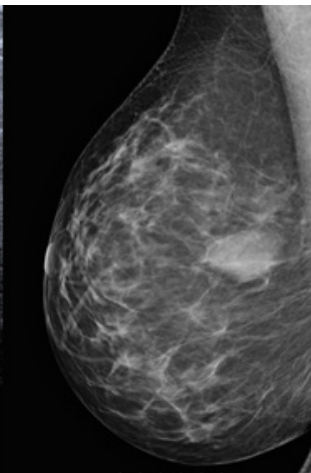
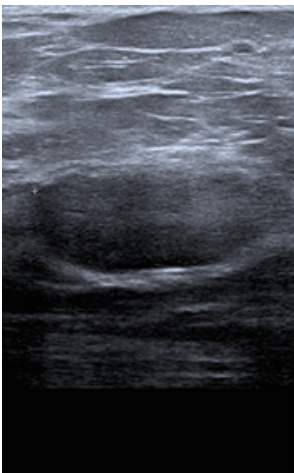


Figure 3 – Nodular PASH. Rare case of “pure” nodular PASH, appearing as a hypoechoic oval mass, parallel to the surface, with circumscribed margins. The mass also appears circumscribed on mammography and magnified view.

mammography descriptions reveal well circumscribed, round to oval masses without calcifications.⁶ We found two myofibroblastomas in our database (there is another lesion that could not be confidently distinguished from PASH included in that group). Both lesions occurred in postmenopausal women, and were moderately worrisome for malignancy. One was isoechoic with circumscribed margins on ultrasound but was irregular with obscured margins on mammography, and the other (Fig 4) was hypoechoic with indistinct margins on ultrasound and showed obscured margins on mammography. They were both excised.

Desmoid-type fibromatosis

Desmoid-type fibromatosis, also known as extra-abdominal desmoid tumour, is a locally infiltrative lesion without metastatic potential that originates from fibroblasts or myofibroblasts. Frequently it extends from the pectoral fascia into the breast. There is an association with trauma, including surgery.¹ Some of these lesions are occult on mammography, but they can appear as irregular lesions with spiculate or indistinct margins, mimicking tumour. They usually do not have calcifications or adenopathy. Ultrasound appearances are variable, but hypoechoic masses with irregular, spiculate,

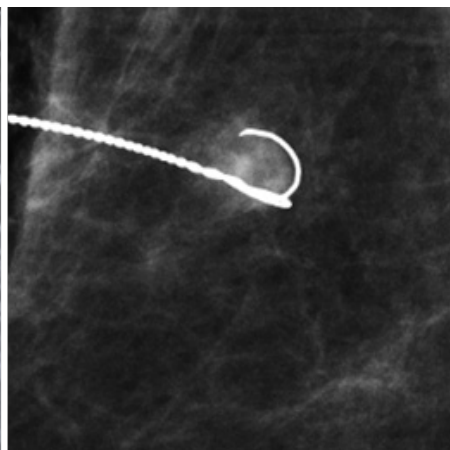
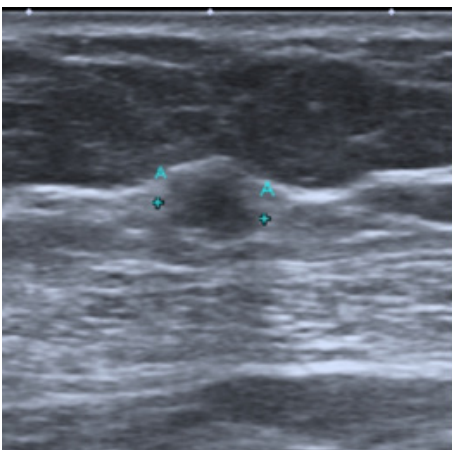


Figure 4 – Myofibroblastoma in a 73-year old female. Hypoechoic mass with indistinct margins on ultrasound and obscured margins on mammography. Pathology showed myofibroblastoma.

or microlobulate borders have been described.² Due to its aggressive growth pattern and tendency for recurrence, management consists of wide excision with clear margins.² Recurrences usually occur within 3 years of excision and commonly require radical surgery.⁷ In our series all of the lesions were hypoechoic and had other findings suspicious for malignancy on ultrasound, such as irregular shape and indistinct margins; two of them also showed posterior shadowing (Fig. 5). On the other hand, two of them appeared as focal asymmetries on mammography, and only one appeared as a spiculate mass. All of the four patients in our series were treated with lumpectomy.

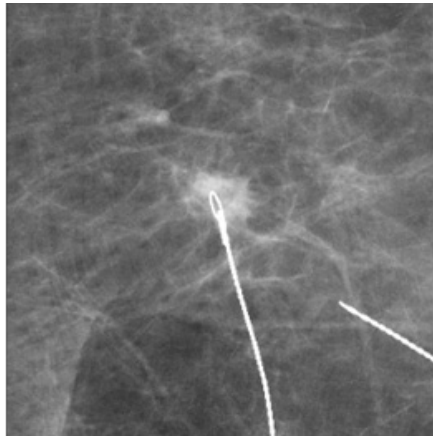
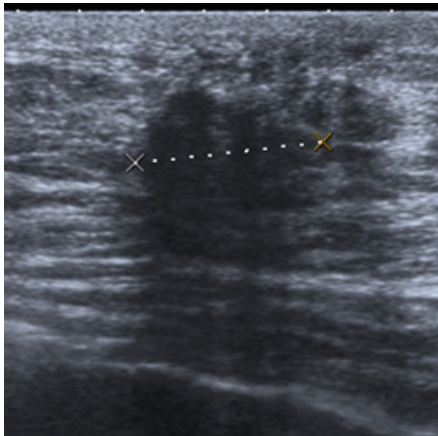


Figure 5 – Fibromatosis (desmoid-type). Hypoechoic, irregular mass with posterior shadowing. Another mass with spiculate margins on mammography.

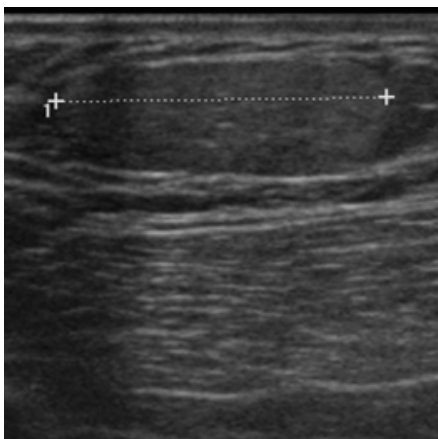


Figure 6 – Angiolipoma. Hyperechoic, oval, parallel mass, typical of lipoma/angiolipoma that was not visible on mammography.

Granular cell tumour

Granular cell tumour is defined as a tumour with eosinophilic granular cytoplasm derived from Schwann cells of peripheral nerves. It is almost always benign (>99%).¹ Nevertheless, malignant cases also have been reported.⁸ The appearance is variable on mammography, ranging from masses to indistinct densities, and their margins from spiculate to circumscribed. Calcifications are rare. The reports are also confounding regarding their ultrasound appearance.² Granular cell tumours can cause skin retraction, nipple inversion or involve the pectoralis fascia.¹ Since they may be locally infiltrative, a wide surgical excision is recommended, and is usually curative.⁸ We found 3 granular cell tumours in our series (Fig 7). All of them were very suspicious for cancer on ultrasound, appearing hypoechoic with indistinct margins and posterior shadowing or with combined posterior pattern. On mammography, the masses were round with indistinct or obscured margins. They were all treated with lumpectomy. One of them showed atypical findings on pathology.

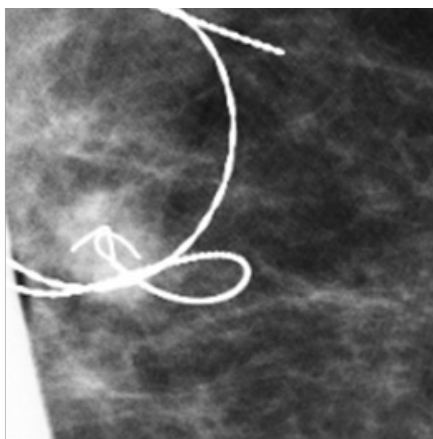
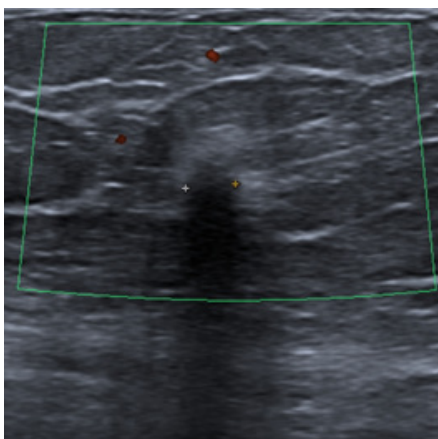


Figure 7 – Granular cell tumour. Hypoechoic mass with indistinct margins and posterior shadowing. On mammography, the mass was round with indistinct margins.

Conclusion

Benign mesenchymal breast tumours have variable imaging appearances that range from benign to overtly malignant. Radiologists working in breast imaging must be familiar with these entities to provide the best care, regarding the decision to maintain imaging follow up or the need for excision.

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Appendix

Table 3 – Results - Imaging Findings*

Age/Sex	Ultrasound	Mammography	Pathology Record
Haemangioma			
58/F	Mass: round, isoechoic, circumscribed, superficial	Mass: round, obscured margins	Lumpectomy
46/F	N/A	Mass: round, microlobulated margins	Core Biopsy
54/F	Mass: oval, isoechoic, microlobulated, superficial	Mass: oval, microlobulated margins	Core Biopsy
PASH			
77/F	Not visible	Mass: irregular, obscured margins	Core Biopsy
45/F	Mass: oval, hypoechoic, parallel, circumscribed	N/A	Core Biopsy
47/F	Not visible	Mass: oval, low density, circumscribed	Core Biopsy
43/F	Mass: oval, hypoechoic, parallel, circumscribed	Not visible	Mastectomy
32/F	Mass: round, parallel, microlobulated margins	Mass: round, obscured margins	Core Biopsy Nodular PASH vs. Fibroadenoma
43/F	Mass: irregular, parallel, indistinct margins, shadowing	N/A	Lumpectomy PASH vs. Myofibroblastoma
47/F	Mass: oval, hypoechoic parallel, circumscribed	Not visible	Core Biopsy
40/F	Mass: oval, isoechoic, parallel, circumscribed	N/A	Core Biopsy
46/F	Architectural distortion with combined posterior pattern	Not visible (dense breast)	Lumpectomy
46/F	Not visible	Mass: irregular, indistinct margins	Core Biopsy
52/F	Mass: oval, hypoechoic, parallel, microlobulated margins	Not visible	Core Biopsy
30/F	Mass: oval, parallel, hypoechoic, circumscribed	Not visible	Core Biopsy
46/F	Mass: oval, hypoechoic, microlobulated margins	N/A	Core Biopsy Nodular PASH vs. Fibroadenoma
66/F	Mass: oval, hypoechoic, parallel, circumscribed	N/A	Core Biopsy
43/F	Architectural distortion	N/A	Core Biopsy
50/F	Mass: oval, hypoechoic, parallel, circumscribed	Mass: oval, circumscribed	Lumpectomy Nodular PASH
47/F	Mass: irregular, heterogeneous echo pattern, indistinct margins, posterior shadowing	Mass: round, obscured margins	Lumpectomy
47/F	Architectural distortion with combined posterior pattern	Focal asymmetry	Core Biopsy
39/F	Mass: oval, hypoechoic, microlobulated margin	N/A	Core Biopsy Nodular PASH vs. Fibroadenoma
37/F	Mass: oval, hypoechoic, circumscribed	Not visible	Biopsy
48/F	Mass: oval, hypoechoic, parallel, circumscribed	Mass: oval, circumscribed with coarse calcification	Lumpectomy
46/F	Mass: irregular, hypoechoic, posterior shadowing	Not visible	Core Biopsy
40/F	Mass: oval, hypoechoic, microlobulated margins	N/A	Core Biopsy Nodular PASH vs. Fibroadenoma
45/F	Architectural distortion with cystic areas	Not visible	Core biopsy
43/F	Mass: oval, heterogeneous, microlobulated margins	Mass: round, fat-containing, obscured margins	Core Biopsy

Myofibroblastoma			
67/F	Mass: oval, isoechoic, circumscribed margins	Mass: irregular, obscured margins	Lumpectomy
73/F	Mass: hypoechoic, round, indistinct margins	Mass: round, obscured margins	Lumpectomy
Desmoid-type fibromatosis			
68/F	Mass: irregular, hypoechoic, posterior shadowing	Focal asymmetry	Lumpectomy
54/F	Mass: round, hypoechoic indistinct margins	Focal asymmetry	Lumpectomy
46/F	N/A	Mass: round, spiculated	Lumpectomy
39/F	Mass: irregular, hypoechoic, posterior shadowing	N/A	Lumpectomy
Angiolipoma			
49/F	Mass: isoechoic, oval, parallel, circumscribed	Focal asymmetry	Mastectomy
51/F	Mass: hyperechoic, oval, parallel, circumscribed	Not visible	Lumpectomy
Granular cell tumor			
50/F	Mass: irregular, hypoechoic, indistinct margins, shadowing	Mass: round, indistinct margins	Lumpectomy Benign features
50/F	Mass: irregular, hypoechoic, indistinct margins, shadowing	Mass: round, obscured margins	Lumpectomy Benign features
58/F	Mass: round, hypoechoic, indistinct margins, combined posterior pattern	Mass: round, obscured margins	Lumpectomy Atypical features

*For each lesion age and sex are mentioned as well as a brief description of findings on ultrasound and mammography. The type of latest pathology specimens, as well as important pathologic information including alternative diagnosis are provided. N/A – Not available