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Myofibroblastoma of the male breast: a rare entity of increasing frequency that can be diagnosed on needle core biopsy

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Authors

Desrosiers, L
Rezk, S
Larkin, A
et al.

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M Tsoumakidou
J Zhu
Z Wang
A Thorley[1]
S Kemp[1]
T Tetley[1]
P K Jeffery

Lung Pathology, Department of Gene Therapy, and [1]*Lung Cell Biology, Section of Airways Disease, National Heart & Lung Institute, Imperial College London, London, UK*

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Advances in the pathology of COPD

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Sir: I read with great interest the very detailed and helpful review on emphysema,[1] and agree this is the gold standard approach to assessment of lung tissue for chronic obstructive pulmonary disease (COPD). Regrettably, autopsy and tissue retention issues in the UK have led to problems with examining lung parenchyma in this format and in most cases only small samples of tissue can be retained for COPD assessment.

For surgical samples, often submitted as thoracoscopic (video-assisted thorascopic surgery) samples with wire suture material at the margins, I would recommend inflation of these samples upon receipt in the laboratory by injecting formalin (by syringe/needle) into the lung parenchyma through the pleura, until the sample looks adequately inflated for ideal fixation. The metal suture is later trimmed off, allowing perpendicular slices to be made across the lung/pleural tissue, permitting detailed analysis.

One issue not covered in any detail in the review is that of occupational dust-related pathology and emphysema. Assessment of emphysema is particularly important at autopsy in this regard, as it is used to substantiate/refute medicolegal claims by relatives of the deceased. It is vital to try to inflate postmortem lung tissue (in a similar manner) for ideal quantification of disease and, even if whole mount lung tissue sections are not available, small, adequately inflated lung samples can produce significant information that can be tested in the legal setting.

In addition, it is worth considering other occupational disease, particularly in relation to metal fumes. Cadmium exposure (for example) can produce significant emphysematous change many years after exposure.[2] Retention of some lung tissue for mass spectroscopy can be particularly useful if one is considering metal or other chemical-related disease.

Finally, whilst I would entirely concur with the pathological approach to classification given in the review, I would suggest that any analysis of lung parenchyma must be cross-correlated against respiratory function tests and other clinical information. Of particular value is computerized tomography/magnetic resonance imaging in terms of extrapolation of small biopsy/autopsy sample histology in order to derive full appreciation of overall pulmonary pathology status.[3]

S K Suvarna

Department of Histopathology, Northern General Hospital, Sheffield, UK

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Myofibroblastoma of the male breast: a rare entity of increasing frequency that can be diagnosed on needle core biopsy

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Sir: Myofibroblastoma is a rare benign mesenchymal tumour that was first described by Wargotz *et al.* in

1987.[1] This tumour usually arises as a well-circumscribed mass that can occur in many sites including lymph nodes, meninges, tongue and subcutis. It has been included in the spectrum of other benign spindle cell stromal tumours such as spindle cell lipomas (SCL) and solitary fibrous tumours (SFT).[2] SCL is also an encapsulated lesion that has been reported in older men in the subcutaneous tissue of the posterior neck, back and shoulder. Other less common sites include the larynx, orbit, extremities, bronchus and breast.[3–5] SFT was originally described as a pleural-based lesion, but it has recently been reported in numerous sites including the liver, meninges, respiratory tract and soft tissue.[6] It usually effects adults between the fourth and seventh decade of life and is often benign, although aggressive forms have been described. Many similarities exist between myofibroblastoma, SCL and SFT.[7,8]

Several authors have presented convincing arguments for the unification of SFT, SCL and myofibroblastoma because they represent a spectrum of fibroblastic differentiation.[2,7,8] Others argue that there is no need to distinguish them further since they are benign lesions. However, the few case reports of the malignant behaviour of some SFT[9] and the rare malignant transformation of SCL to liposarcoma make recognition of myofibroblastoma important from a prognostic point of view.[10] To the best of our knowledge, no reports have focused on morphology and immunohistochemical features on needle core biopsy of breast myofibroblastoma. We report two cases of male breast myofibroblastoma. We have found that careful inspection of key histological features and immunohistochemistry can aid in the correct identification of myofibroblastoma on needle core biopsy.

The first case was a 63-year-old male who presented with a well-defined 10-mm supra-areolar nodule discovered on routine physical examination. Subsequent mammography revealed a well-circumscribed 10-mm nodule. Ultrasound-guided core biopsy followed by a lumpectomy was performed.

The core needle biopsy specimen was composed of a slightly hypercellular fragment of spindle and ovoid-shaped cells interspersed by thick eosinophilic fascicles of collagen. Thick, slightly wavy, eosinophilic hyalinized collagenous fibres interspersed haphazardly were noted within the lesion. Several areas showed extravasation of red blood cells and rare mitotic figures were noted. Mast cells were abundant and mature adipose tissue was seen at the periphery (Figure 1). Immunohistochemistry was positive for desmin, CD34, smooth muscle actin (SMA), CD99, Bcl-2, oestrogen receptor (ER) and progesterone receptor (PR) (Figure 2 and Table 1).

The specimen consisted of an ovoid portion of fibroadipose tissue that was serially sectioned to reveal a discrete tan-white mass measuring $9 \times 8 \times 6$ mm

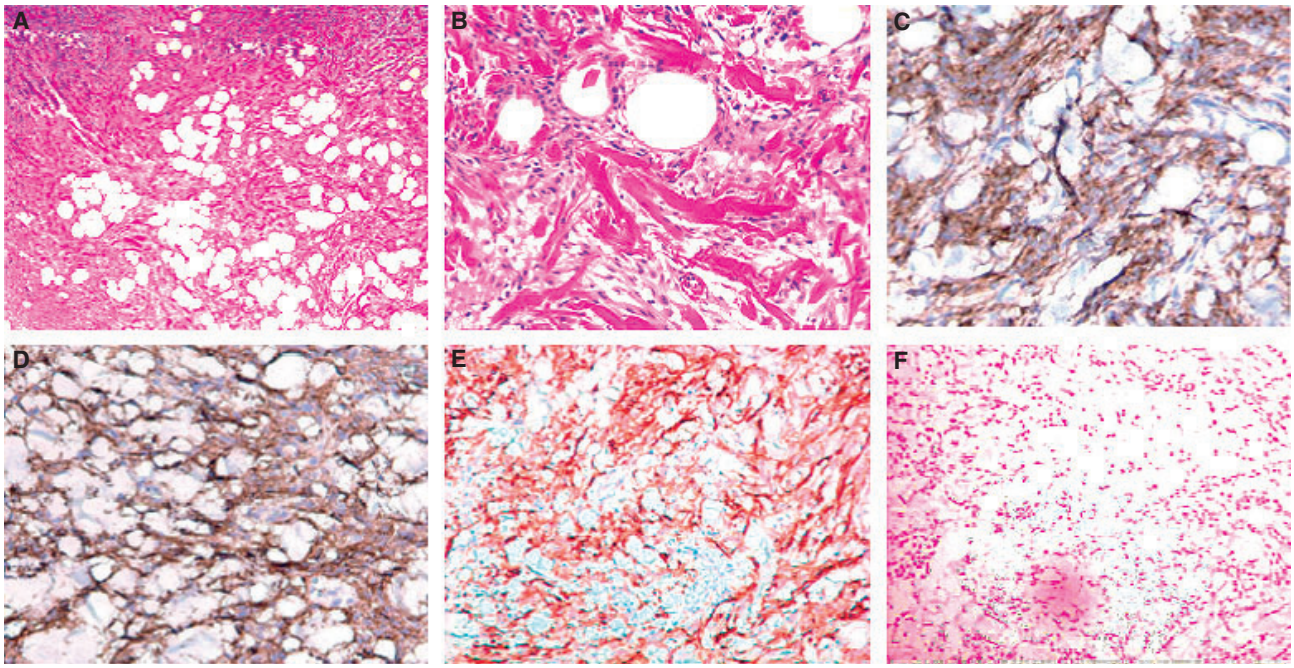

Figure 1. Immunohistochemical profile of case 1. **A**, H&E. **B**, H&E. **C–F**, Bcl-2, CD99, desmin, S100.

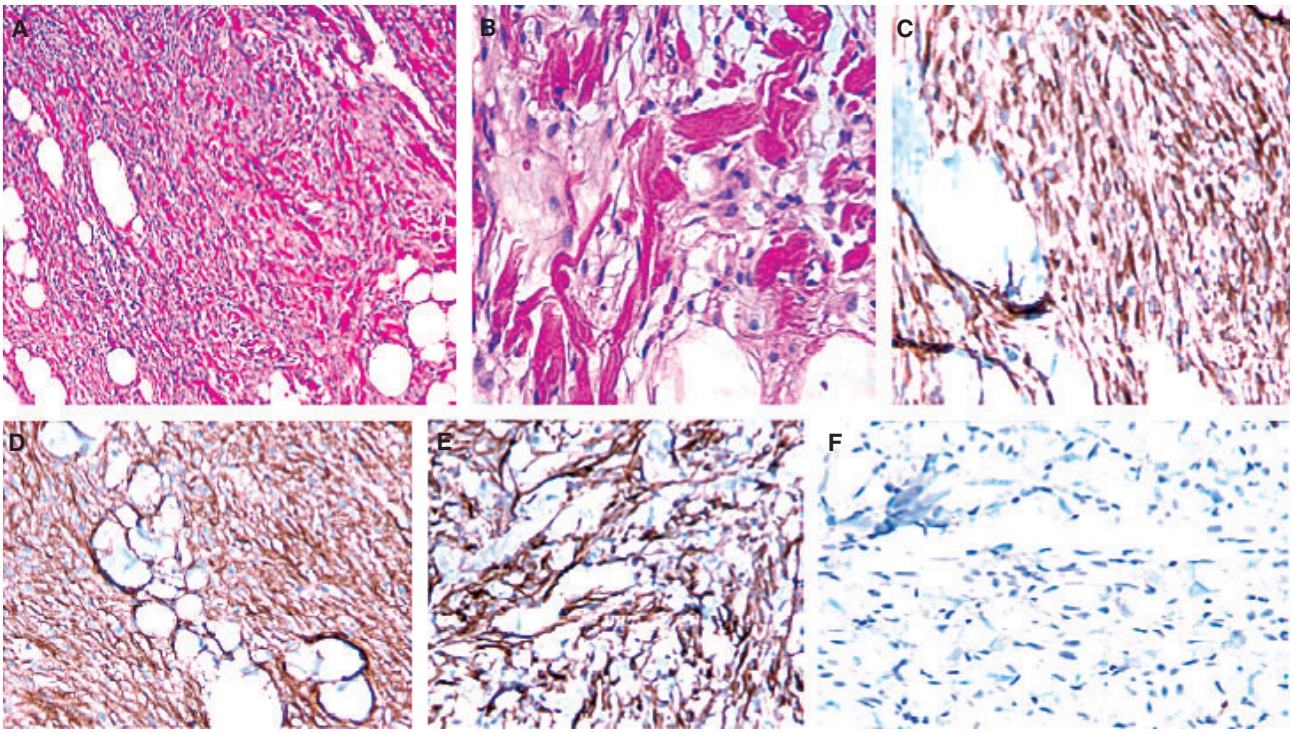

Figure 2. Immunohistochemical profile of case 2. **A**, H&E. **B**, H&E. **C–F**, Bcl-2, CD99, desmin, S100.

Table 1. Immunohistochemical pattern for two cases of myofibroblastoma

Immunostains	Case 1	Case 2
Desmin	Positive	Positive
SMA	Positive	Focally positive
CD 34	Positive	Positive
CD 99	Weakly positive	Positive
BCL-2	Positive	Positive
S100	Negative	Negative

SMA, smooth muscle actin.

and corresponding to the density radiological. The cut surfaces of the mass were homogeneous without any areas of necrosis or haemorrhage. Microscopic examination revealed the same morphology as seen on the needle core biopsy specimen.

The second case was a 66-year-old male who presented with a painless, well-circumscribed, slow-growing subareolar nodule in his breast for 2 months. Ultrasound-guided needle core biopsy was performed. Subsequently, the mass was removed by lumpectomy.

The core biopsy specimen was composed of monomorphic small to medium-sized spindle cells arranged in fascicles admixed with mature adipose tissue and haphazardly arranged thick eosinophilic bundles of collagen (Figure 3). Tumour cells were immunohistochemically positive for desmin, CD34, SMA, CD99, Bcl-2, ER and PR.

The specimen consisted of an irregularly shaped portion of fibrofatty breast tissue. Serial sectioning revealed a $19 \times 18 \times 17$ mm fairly well-circumscribed firm nodule. The cut surfaces were homogeneous with no areas of necrosis or haemorrhage. Microscopic examination revealed monomorphic cells with spindle to ovoid-shaped nuclei arranged in clusters and short fascicles admixed with mature adipose tissue and haphazardly arranged thick eosinophilic bundles of collagen. These findings were consistent with those seen on the core biopsy specimen.

Myofibroblastoma is an uncommon stromal tumour seen in the male breast. The major differential diagnosis for our two cases was SCL due to scattered enlarged adipose tissue within the mass seen especially in the second case. Other diagnoses to consider included SFT, fibromatosis and nodular fasciitis. We have constructed a table of immunohistochemical profiles that will help

Table 2. Morphological and immunohistochemical patterns of key lesion included in the differential diagnosis of myofibroblastoma

		Immunohistochemistry					
Lesions	Morphology	Desmin	SMA	S100	CD34	CD99	Bcl-2
Myofibroblastoma	Well-circumscribed mass composed of slender fibroblast-like cells arranged in short fascicles intersected by thick eosinophilic collagenous fibres with varying amounts of adipose tissue	+	+	–	Variable	+	+
Spindle cell lipoma	Bland spindle cells in a mucinous, fibrous background with thick collagen bundles; mast cells and well differentiated lipocytes are common, but no lipoblasts	–	–	+	+ (Spindle cells)	–	+
Solitary fibrous tumour	Nodular, firm mass composed of spindle cells arranged in a 'patternless' pattern. At low power there is a variegated appearance due to the mixture of hyper and hypocellular areas	– (Rarely positive)	–	–	+	+	+
Fibromatosis*	Long fascicles within a fibrous stroma with infiltrative borders and entrapped fat admixed with glandular breast tissue	+	+	–	–	N/A	N/A
Nodular fascitis*	Round plump fibroblasts with many mitoses and an inflammatory lymphocytic component arranged in short irregular fascicles within a myxoid stroma	–	+	–	–	N/A	N/A

*Immunohistochemical staining pattern for CD99 and Bcl-2 have not been well documented in these lesions.

distinguish myofibroblastoma from similar lesions (Table 2).

Myofibroblastoma usually presents as a well-circumscribed mass composed of slender fibroblast-like cells arranged in short fascicles intersected by thick eosinophilic collagenous fibres and with varying amounts of adipose tissue. Immunohistochemically, the tumour cells are positive for desmin, SMA, CD34, Bcl-2 and variably positive for CD99.[11,12]

SCLs are composed of bland-appearing mature adipocytes that are positive for CD34 (spindle cell component) and vimentin.[6,13] They lack the myogenic markers (SMA and desmin) that are positive in myofibroblastoma. In contrast, spindle cell liposarcoma presents with hyperchromatic atypical nuclei, variable atypical stromal cells and the presence of lipoblasts. SFT, which usually presents as an exophytic mass, is composed of spindle cells arranged in short, ill-defined fascicles, resulting in a 'patternless' pattern characteristic of this tumour. Typically, SFTs have little mitotic activity, mild nuclear atypia and, overall, are considered to be benign. It is prudent to note that malignant forms have been identified. Immunohistochemically, tumour cells are positive for CD34, CD99, Bcl-2 and, rarely, desmin.[6,9]

Other tumours included in the differential diagnosis are fibromatosis and nodular fasciitis. Fibromatosis usually has infiltrative borders and entrapped fat admixed with glandular breast tissue.[14–16] It is composed of long fascicles within a fibrous stroma, which differs from the short haphazard fascicles and thick eosinophilic collagen bands associated with myofibro-

blastoma. Immunohistochemically, fibromatosis shows positivity for SMA, but is usually negative for CD34.[14,15] Nodular fasciitis has been rarely observed in the breast and is composed of round plump fibroblasts with many mitoses and an inflammatory lymphocytic component. These cells are arranged in short irregular bundles and fascicles within a matrix composed of a rich meshwork of reticulin.[16]

As radiological technology advances, the ability to detect smaller lesions will increase and more of these tumours will be identified. It also seems that refined extraction techniques will make core needle biopsies one of the first line modalities for pathological inspection of these specimens. With that comes the responsibility of being able to differentiate correctly between these lesions and more malignant lesions. We believe that myofibroblastoma, SCL, SFT and other histologically similar appearing malignant lesions can be distinguished from one another using the combination of morphology and immunohistochemistry and radiological findings.

L Desrosiers
S Rezk
A Larkin
A Khan
C Li

Department of Pathology and Surgery, University of Massachusetts School of Medicine, Worcester, MA, USA

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Lymphoid tissue in the breast: a histological conundrum

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Sir: Lymphoid tissue can be seen in the breast parenchyma in native and non-native forms. The former includes intramammary lymph nodes, the latter inflammatory conditions such as chronic non-specific inflammation, lymphocytic lobulitis and chronic granulomatous mastitis. Preneoplastic and some overtly neoplastic conditions of the breast can demonstrate lymphoid tissue, including medullary carcinoma and lymphoma. We report a case with an unusual proliferation of lymphoid tissue within the breast, which probably falls within the spectrum of pseudolymphoma/idiopathic lymphoid hyperplasia.[1,2]

A 52-year-old woman presented with a lumpy area in the medial aspect of the left breast of a few weeks' duration. There was no history of trauma to that area. The mammogram showed nodular shadowing with no microcalcification. Fine-needle aspiration demonstrated mature and immature lymphoid cells including a few tingible body macrophages in keeping with an aspirate from an intramammary lymph node. Wide local excision was carried out, weighing 40 g and measuring $20 \times 60 \times 70$ mm. Selected blocks submitted for

