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Multimodality imaging findings of mammary-type myofibroblastoma in the posterior chest wall

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Abstract

Mammary myofibroblastoma is a rare, benign, mesenchymal neoplasm first described in the breast in 1987. Often involving the breast, mammary myofibroblastoma (MTMF) in an extra-mammary location is an even rarer phenomenon, having been reported in musculoskeletal soft tissue, intraabdominal compartments, and abdominal solid visceral organs. We present the imaging findings of MTMF in an 85-year-old man in the posterior chest wall, an unusual location for the neoplasm. After raising concerns for a soft tissue sarcoma, it was later excised.

Keywords

Mammary myofibroblastoma; Posterior chest wall; Extra-mammary.

Introduction

Assessment of soft tissue mass lesions can be challenging on imaging. The differential diagnosis may depend on the tissue composition of the mass, deduced by echogenicity on ultrasound and via density values on computed tomography (CT). Fat saturation techniques on Magnetic Resonance Imaging (MRI) and contrast enhancement, both on CT and MRI, and the location of the mass are other differential tools [1]. Mammary type myofibroblastoma of the soft tissue is a rare neoplasm presenting with benign pathologic and clinical features. It can be mistaken for soft tissue sarcomas on imaging during its initial presentation [2,3]. We report a case of Mammary-type myofibroblastoma (MTMF) arising from the posterior chest wall retro scapular subcutaneous soft tissue and reviewed the imaging findings on US, CT, and MRI.

Case Presentation

An 85-year-old male presented to the clinic for evaluation of an 8 cm non-tender, slightly mobile mass on his upper back, posterior to the scapula. He noticed the mass around one month ago and denied

any pain, growth, or other related symptoms. Bedside ultrasound showed soft tissue mass different in appearance than the surrounding fat. It has a smooth border superficially, with some irregularity at the deep border. The patient has a history of diabetes mellitus with nephropathy, osteoporosis, and a resected high-grade transitional cell carcinoma of the bladder.

The repeat legitimate ultrasound examination revealed a 7.8 X 2.3 X 6.9 cm deep subcutaneous mass with a more superficial anterior lobulated component measuring 2.5 X 1.3 cm. It had a heterogeneous hyperechoic echotexture with no prominent internal blood flow (Figure 1). Findings suggested a lipomatous mass. An MRI of the chest displayed a mushroom-shaped well-circumscribed 4.8 x 3.7 x 3.3 cm subcutaneous mass at the inferior right posterolateral chest wall (Figure 2a). It overlaid the latissimus dorsi muscle and contained an additional 2.3 X 1.6 cm superficial nodular component. A 2 mm fat plane separated the deep margin of the mass from the muscular layer. On T1-weighted imaging, mild patches of T1 shortening within the mass were noted, reflecting mild adipose content (Figures 2b and 2c). On T2-weighted images, the mass is very high in signal intensity, with some areas of hypointensity corresponding to non-dominant adipose tissue (Figure 2d). The MRI findings suggested a myxoid-type liposarcoma. CT of the thorax without IV contrast revealed a stable 4.8 X 3.7 X 3.3 cm well-circumscribed lobulated mass in the subcutaneous fat tissue (Figure 3).

The resected mass grossly appeared as a soft circumscribed grey-white tumor measuring 5.5 X 4.5 X 3.5, with a tongue-like budding near the superficial medial aspect. Microscopically, it contained biphasic lipomatous and spindle cell neoplasia in subcutaneous fat. Its spindle cell component predominated with uniform spindle cells embedded in a collagenous ropey stroma with focally myxoid changes (Figure 4). There were a few mast cells and pleomorphic cells scattered throughout. The lipomatous component comprises 20-30% of the tumor and is scattered evenly within the tumor. Thick hyalinized blood vessels were present. No mitotic activity or necrosis was detected. The spindle cells stained positive for CD34, and negative for S-100, and Desmin (Figure 5).

These findings were consistent with the differential diagnosis of mammary type myofibroblastoma of soft tissue. A CT done on the patient seven months later revealed no further visualization of the lobulated mass, with only remnant subcutaneous fat stranding.

Discussion

Mammary-type myofibroblastoma (MTMF) is a benign mesenchymal neoplasm that was initially known to occur in the breast. MTMF has been a distinct pathologic entity occurring in the breast of older men, and previously recognized as “benign spindle cell tumor of the breast” and subsequently reported as “spindle cell lipoma,” “fibroma,” “myogenic stromal tumor,” or “solitary fibrous tumor” of the breast [2,4].

The wider anatomic distribution of MTMF has been reported with increasing incidence. The most common reported extramammary distribution sites are the extremities, intraabdominal retroperitoneal spaces, and in rare instances involving abdominal solid viscera including the liver [5-8].

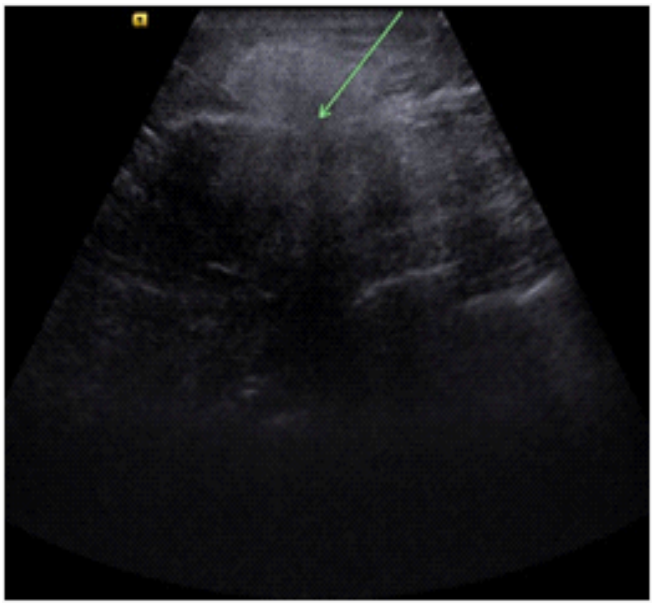

Figure 1: Ultrasound of the chest soft tissue reveals posterior thoracic wall mass with patchy increased internal echogenicity (green arrow).

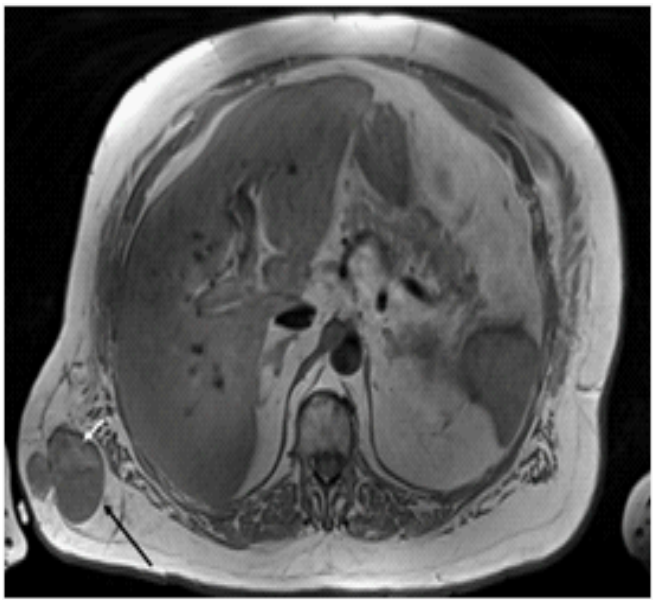

Figure 2a: T1-weighted MRI reveals mushroom shaped posterior wall mass (black arrow) with hyperintense internal composition (white arrow) representing fat.

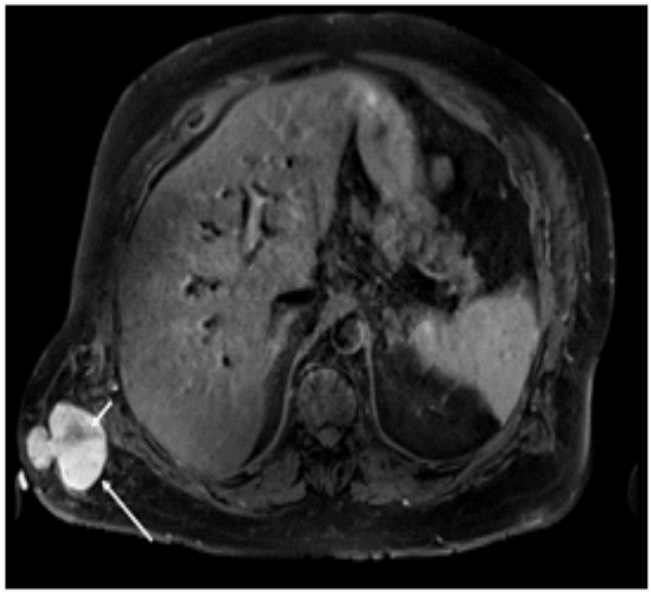

Figure 2b: Precontrast T1-weighted fat saturated image reveals the mushroom shaped mass in the posterior chest wall (long arrow) with hypointense central signal (short arrow).

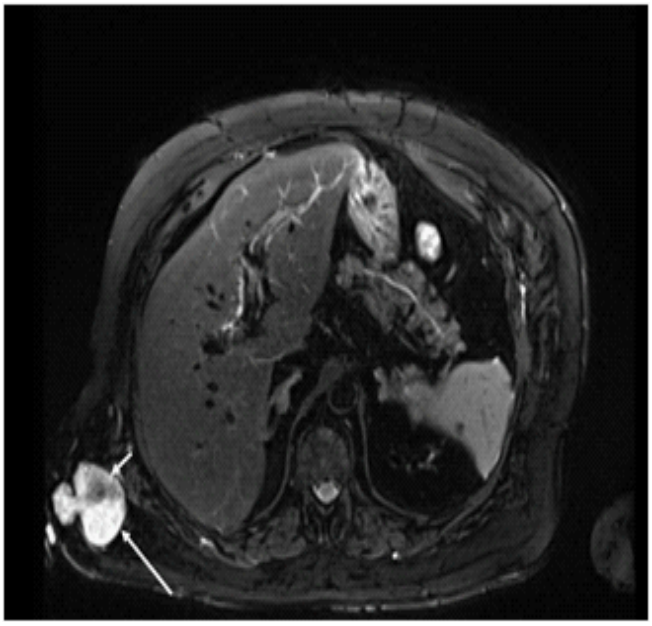

Figure 2c: Postcontrast T1-weighted image reveals enhancement of the mass (long arrow), sparing the central part (short arrow).

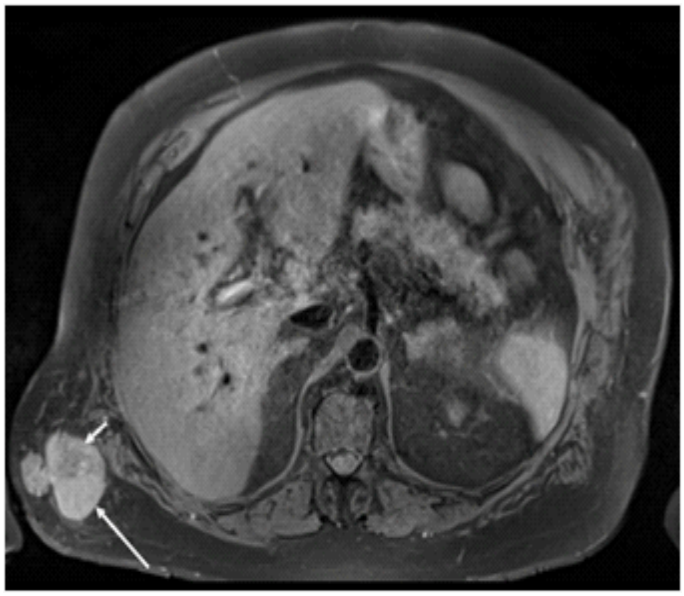

Figure 2d: T2-weighted fat saturated MRI reveals the same mushroom shaped mass with hyperintense signal (long arrow) and a hypointense island (short arrow) which corresponds to fat content.

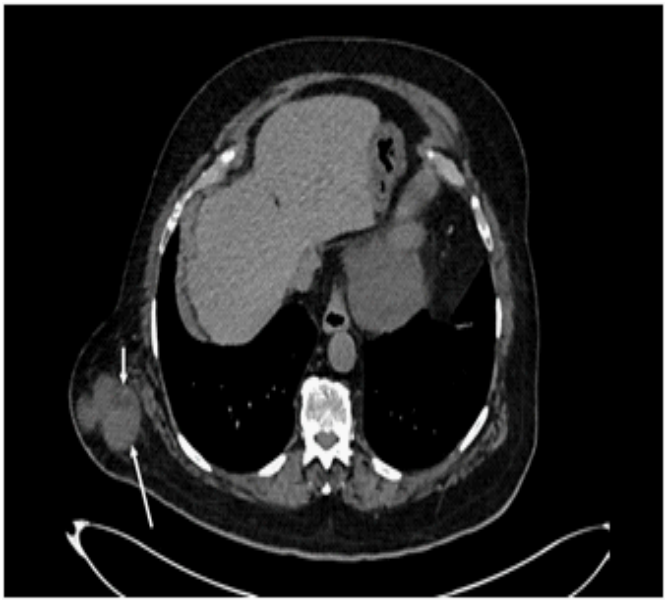

Figure 3: Non-contrast CT of the chest reveals posterior chest wall lesion with soft tissue density (long arrow) and hypodense central content (short arrow) which corresponds to fat content

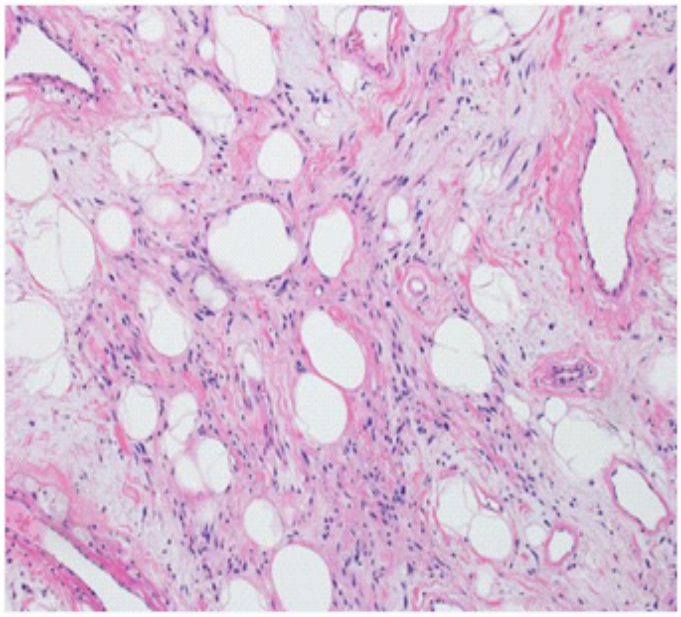

Figure 4: Histologic section of mass revealing spindle cell proliferation, fatty cells and vascular component.

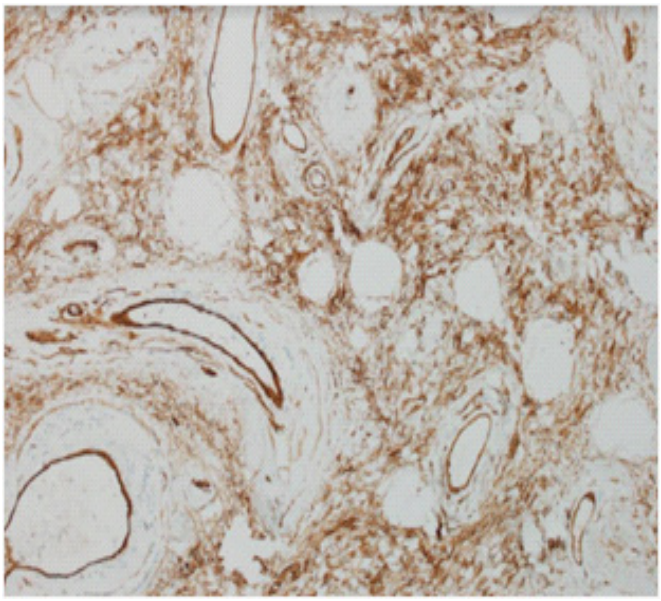

Figure 5: CD34 immunostain showing the positive expression in the spindle cells. Internal positive control are the thick vessels with lining endothelium.

In addition, unusual morphologic features including cytologic atypia, epithelioid morphology, and infiltrative growth have been reported to occur in MTMF but with no apparent association with aggressive clinical behavior. The differential diagnosis of MTMF can be broad and somewhat dependent upon the anatomic location and/or the presence of unusual morphologic features. Most considered differential diagnoses include spindle cell lipoma and cellular angiofibroma. There are overlaps of internal composition and CD34 expression between MTMF and spindle cell lipoma and or cellular angiofibroma based on a histopathologic review [2].

The presence of fat and enhancing soft tissue on imaging may raise concerns for liposarcoma as a differential diagnosis. Several prior case reports described the challenges in the differential diagnosis of MTMF on imaging in the presence of fat [9]. The posterior chest wall lesion in our case was in the retroscapular subcutaneous soft tissue and had fat content, which raised the suspicion of liposarcoma. Another possible differential diagnosis of the retroscapular soft tissue mass may include elastofibroma dorsi, which has unique imaging findings. Elastofibroma Dorsi is distinctly located in the infrascapular regions, deep to the serratus anterior and latissimus dorsi musculature. On imaging, it is composed of fibrous tissue with internal fatty streaks.

Conclusion

In conclusion, we described the imaging features of Mammary-type myofibroblastoma in the posterior chest wall in the retroscapular soft tissue. Since the imaging findings were not characteristic to rule out malignancy, surgical exploration was mandatory.

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