Clinical History

75-year-old female patient with history of diffuse lipomatosis. In the follow up, the patient presented with a painless mass located in the right upper quadrant which had grown slowly in recent years. The patient underwent multiple imaging tests (ultrasound, MRI, CT with contrast and angiography) and surgical excision was recommended.

Imaging Findings

Ultrasound demonstrated a 10 cm well-defined heterogeneous hypoechoic solid mass located in the right anterolateral thoracoabdominal wall. Important Doppler vascularization was noted (Fig. 1).

Contrast-enhanced CT images showed a well-defined soft-tissue heterogeneously enhancing lobular mass (Fig. 2 and 3).

MRI was performed and showed a well-defined soft-tissue mass of heterogeneous intermediate signal intensity on both T1 and T2 images. Areas of high intensity within the lesion consistent with myxoid change, necrosis, or cystic degeneration are shown on T2 images. Flow voids corresponding to prominent perilesional feeding vessels are shown on STIR image.
Contrast-enhanced MRI revealed intense heterogeneous enhancement with central areas of low intensity (Fig. 4 and 5).

Preoperative embolization to reduce intraoperative blood loss was required and the angiogram showed important feeding vessels from a large and tortuous internal mammary artery (Fig. 6).

**Discussion**

Solitary fibrous tumors (SFT) are rare mesenchymal tumors that can be benign or malignant. SFT are most commonly located in the thorax, but can occur throughout the body. SFT commonly present during the fifth and sixth decades and there is no sex predilection [1, 2].

SFT in the thoracic cavity, particularly those with small size, are asymptomatic and are diagnosed as incidental findings on imaging tests. Large intrathoracic and extrathoracic SFT, however, are usually symptomatic; the manifestations are a painless mass or local pressure effects. Systemic complaints may occur. Paraneoplastic syndromes such as hypoglycemia, digital clubbing, and hypertrophic osteoarthropathy are uncommon [1 - 4].

On CT, small SFT are well-defined, homogeneously hyperdense masses, while large tumors, may appear heterogeneous. Tumors were usually highly vascular and enhancement is typically heterogeneous with central areas of low attenuation. Serpiginous branching linear areas of enhancement consistent with intralesional vessels can be seen [1, 2, 4].

On MRI, SFT demonstrate intermediate heterogeneous signal intensity on both T1 and T2 images. Areas of cystic degeneration, hemorrhage, necrosis and prominent vascular structures may appear as high signal intensity on T2 images. Flow voids corresponding to prominent perilesional feeding vessels may be seen. SFT show intense heterogeneous enhancement after administration of gadolinium [2 - 4].

On ultrasound, the majority of small SFT appear as homogeneous hypoechoic masses. Occasionally, large SFT are heterogeneous, and this feature corresponds to the heterogeneity seen on images obtained with other modalities [1, 2].

Angiography is useful in determining the vascular supply to the lesion and may be performed to lesions requiring preoperative embolization in order to reduce intraoperative blood loss [2, 4]. In general, the finding of a well-defined large, solid, highly vascular tumor, particularly with prominent feeding vessels, should alert the radiologist to the possible diagnosis of SFT [3].

Biopsy is required for definitive diagnosis and the final diagnosis of our case was made with the histologic findings of the surgical specimen (Fig. 7). SFT are composed of whorls of reticulin and collagen with interspersed spindle-shaped cells. These tumors have a variety of architectural patterns. Because of the variable microscopic appearances of SFT, immunohistochemical analysis plays an important role in the diagnosis. Typically, diffuse positivity for CD34, bcl-2, CD99 and vimentin is the basis of a certain diagnosis (Fig. 8) [1-5].

Surgical resection is the treatment of choice, because approximately 20% of these tumors are malignant, and even benign SFT have indeterminate malignant potential [1 - 3, 5].
Final Diagnosis

Solitary fibrous tumour of the chest wall

Differential Diagnosis List

Malignant fibrous histiocytoma, Leiomyosarcoma, Alveolar soft-part sarcoma, Angiosarcoma, Solitary vascular metastatic lesion

Figures

Figure 1 Ultrasound / Colour Doppler ultrasound

A) US demonstrates a well-defined slightly heterogeneous hypoechoic solid mass in the right anterolateral thoracoabdominal wall. B) Doppler US shows important vascularization (arrow).

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Area of Interest: Thoracic wall; Imaging Technique: Ultrasound; Ultrasound-Colour Doppler; Procedure: Diagnostic procedure; Special Focus: Neoplasia;

Figure 2 Contrast-enhanced CT (arterial phase)
Contrast-enhanced CT shows a well-defined heterogeneously enhancing lobular mass. Serpiginous linear areas of enhancement consistent with intralesional vessels are shown in the arterial phase (arrow).

Area of Interest: Thoracic wall;
Imaging Technique: CT; CT-Angiography;
Procedure: Diagnostic procedure;
Special Focus: Neoplasia;

Figure 3 Contrast-enhanced CT (portal phase)

Contrast-enhanced CT shows a well-defined heterogeneously enhancing lobular mass. Areas of low attenuation within the lesion consistent with myxoid change, necrosis, or cystic degeneration are noted in the portal phase (arrows).

Area of Interest: Thoracic wall;
Imaging Technique: CT; CT-Angiography;
Procedure: Diagnostic procedure;
Special Focus: Neoplasia;

Figure 4 MRI (T1 / T2)

Axial T1 and T2 MR images show well-defined soft-tissue mass of heterogeneous
intermediate signal intensity. Areas of high intensity within the lesion consistent with myxoid change, necrosis, or cystic degeneration are shown on T2 (arrows).

**Figure 5 MRI (STIR / T1 + GAD)**

A) Axial STIR MR image. Flow voids corresponding to prominent perilesional feeding vessels are seen within the lesion (arrow). B) Axial contrast-enhanced MR image. Intense heterogeneous enhancement with central areas of low intensity (arrows).

**Figure 6 Angiography / 3D volume rendering CT reconstruction**

A) Digital subtraction angiogram shows important feeding vessels from the internal mammary artery (arrow). B) 3D volume rendering CT reconstruction image shows the tumour blood supply from the large and tortuous internal mammary artery (arrow).
Procedure: Diagnostic procedure; Embolisation; Special Focus: Neoplasia;

**Figure 7 Intraoperative gross photographs**

A) Intraoperative gross photograph shows a well-circumscribed, encapsulated and highly vascular mass with lobular external surface. B) Intraoperative gross photograph of the vascular pedicle of the mass which contains feeding vessels (arrow).

Area of Interest: Thoracic wall; Imaging Technique: Experimental; Procedure: Intraoperative; Surgery; Special Focus: Neoplasia;

**Figure 8 Pathology**

Hematoxylin-eosin (H-E) photomicrograph. Highly cellular proliferation of spindled cells arranged in a storiform pattern. Staghorn-like vessels are shown (arrow). Immunohistochemical analysis. The tumor has diffuse positive immunohistochemical result for CD34, CD99 and Bcl-2.

Area of Interest: Thoracic wall; Imaging Technique: Image manipulation / Reconstruction; Procedure: Biopsy; Special Focus: Neoplasia;
References


Citation

Lerma Gallardo JL, Monte González JC, Bustos García de Castro A, Cabeza Martínez B, Estrada Muñoz L, Ferreiros Domínguez J.

Hospital Clínico San Carlos
Profesor Martín Lagos, S/N
Madrid - 28040, Spain
Email: joseluislermagallardo@gmail.com (2017, Mar. 26)

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URL: http://www.eurorad.org/case.php?id=14592