A 57-year-old male patient was referred by his primary care physician because of the radiological finding of a thoracic mass, in a chest radiography performed to study his sleep apnoea hypopnoea syndrome. The patient was a smoker who reported seven to eight month long productive cough.

**Imaging Findings:**

Posteroanterior and lateral chest radiographs showed a well-defined mass in the postero-lateral-superior region of the right hemithorax with a greater craniocaudal diameter than the transverse, forming obtuse angles with the superior wall and acute with the inferior wall and associate with no rib invasion (Fig. 1). CT with intravenous contrast revealed a pleural mass of homogeneous density, predominantly fat (-80 to -100 HU), well defined borders and growth inwards the thoracic cavity, not showing enhancement after the administration of intravenous contrast and diameters of 6.2 x 5 cm, with no evidence of thoracic wall invasion (Fig. 2-3). MRI showed a well-defined pleural-based mass, homogeneously hyperintense in T1 and T2-weighted MR images. A thin hypointense capsule was observed in T2 weighting and some hypointense septa were seen. There was homogeneous suppression of signal intensity on the T1 fat saturation sequence. No enhancement was observed after gadolinium injection (Fig. 4).

**Discussion:**

The most common soft tissue sarcomas in adulthood are liposarcomas, with a peak incidence between 40 and 60 years [1], with the retroperitoneum and thigh being the most frequent locations. However, primary pleural sarcomas are extremely rare malignant tumours [2].

Malignant pleural disease has a bad prognosis. 90% of the cases are secondary to metastasis or lymphoma. Only 10% are malignant pleural mesothelioma or other tumours such as liposarcoma [3].

Most of the patients with liposarcoma in the thoracic cavity (85%) have symptoms, while 15% are asymptomatic and are diagnosed through a routine chest radiography [4]. Most common symptoms in these patients are chest pain, cough, dyspnoea and pleural effusion [2].

The main differential diagnosis based on imaging findings is lipoma [5]. In both lipoma and liposarcoma, fat may be found on CT (< 20 HU) and MRI (depending on the sequence used). On T1-weighted sequences fat has high signal intensity that decreases on T2-weighted images. Moreover, fat saturation and STIR sequences can suppress the fat signal and therefore confirm the presence of fat. Contrast may help define the tumour and reveal vascular areas.

Lipomas are seen as subcutaneous fat-containing lesions. Some of them may contain connective tissue septa. There are several kinds of liposarcomas, such as well differentiated liposarcomas or atypical lipomas (our case),
myxoid liposarcomas, pleomorphic and round-cell liposarcomas and dedifferentiated liposarcomas. Well differentiated liposarcomas or atypical lipomas contain more than 75% of fat. There are three subtypes: lipoma-like, inflammatory and sclerosing well-differentiated. Pathologic examination is necessary to establish a diagnosis. They can recur if there is no complete surgical removal, but they do not metastasize. Myxoid liposarcomas (most common, 50%) have an inhomogeneous and cystic appearance on MRI. Pleomorphic and round-cell liposarcomas also have an inhomogeneous appearance, often containing areas of necrosis. Dedifferentiated liposarcomas possess a high-grade nonlipogenic sarcoma component with a well-differentiated liposarcoma component [6].

Diffusion-weighted MRI is a promising tool for differentiating malignant from benign pleural lesions accurately, complementing with dynamic contrast enhanced MRI. The importance of these techniques is the dissemination risk of the biopsy. PET –CT is not tumour-specific and can also be positive in inflammatory lesions [3]. Thus, in our case, histologic examination of the surgically resected specimen confirmed the final diagnosis.

Surgical resection, as in our case, is the only treatment option, with chemotherapy and radiotherapy remaining ineffective [4]. Some studies report that adjuvant radiotherapy may benefit patients [2].

**Differential Diagnosis List:** Well differentiated liposarcoma, Atypical lipoma, Fat lineage tumour metastasis

**References:**

Figure 1

Description: Posteroanterior chest radiography shows a mass in the right hemithorax.

Origin: Department of Radiology, JM Morales Meseguer Hospital, Murcia, Spain
Description: Lateral chest radiography shows an extrapulmonary mass. Origin: Department of Radiology, JM Morales Meseguer Hospital, Murcia, Spain
Figure 2

**Description:** Mediastinal window shows a homogeneus mass without enhancement after intravenous contrast administration. **Origin:** Department of Radiology, JM Morales Meseguer Hospital, Murcia, Spain
**Description:** Lung window shows an extrapulmonary and well-defined mass. **Origin:** Department of Radiology, JM Morales Meseguer Hospital, Murcia, Spain
Description: Coronal CT reconstruction 

Origin: Department of Radiology, JM Morales
Meseguer Hospital, Murcia, Spain
Description: Sagittal CT reconstruction

Origin: Department of Radiology, JM Morales
Meseguer Hospital, Murcia, Spain
**Description:** T1-weighted sequence shows a homogeneously hyperintense mass. **Origin:** Department of Radiology, JM Morales Meseguer Hospital, Murcia, Spain
Description: T2-weighted sequence shows a homogeneously hyperintense mass. Origin: Department of Radiology, JM Morales Meseguer Hospital, Murcia, Spain
Description: T1 fat saturation sequence shows homogeneus suppression of the signal intensity of the mass. Origin: Department of Radiology, JM Morales Meseguer Hospital, Murcia, Spain

Description: Fat saturation contrast-enhanced sequence shows no enhancement post gadolinium. Origin: Department of Radiology, JM Morales Meseguer Hospital, Murcia, Spain