A case of hibernoma
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A 43-year-old female patient with lumbar spine fibrous dysplasia associated to iliopsoas incidentaloma.

Imaging Findings:
A 43-year-old female patient presented to our department with low back pain which did not respond to painkillers and ambulation difficulties.

After close neurological examinations and L5 biopsy, diagnosis of fibrous dysplasia was made. She underwent surgical operation, then a PET was performed, showing active metabolism in the ilio-psoas muscle belly (Fig. 1).

CT of the lesion, which appeared as a hypointense mass, suggested a lipoma-like lesion (Fig. 2).

Then biopsy defined the nature of the lesion as a hibernoma.

MRI was performed showing a well-defined mass, isointense to subcutaneous fat in FSE T1 images, high signal in T2 TSE images and no full suppression on fat-saturated T2-weighted images (Fig. 3).

Surgical treatment of the lesion is being planned.

Discussion:
Hibernoma is a rare and asymptomatic benign tumour of muscles and soft tissues which arises mostly in adults from the remnants of fetal brown adipose tissue [1].

It usually occurs between ages 20 and 50 years.

In the adult, brown fat is usually found as persisting vestigial remnants along the oesophagus, trachea, posterior neck, interscapular area and around the great vessels of the mediastinum.

The most common anatomic locations include thigh, shoulder, back, neck, chest, arm and abdominal cavity/retroperitoneum; but they also occur in sites where brown fat is usually absent.

Hibernomas are slow-growing, painless neoplasms which do not recur. No malignant potential is known.

The hibernoma has been described as well encapsulated, tan-brown lobulated tumour. However, infiltration of adjacent structures, particularly striated muscle may be present [2-3].

Four morphologic variants of hibernoma were identified: typical; myxoid; spindle cell, and lipoma-like. The tumour is
divided into lobules by thin septa. There are three cell types: large coarsely vacuolated cells, large finely vacuolated cells with eosinophilic granular cytoplasm and mature univacuolated adipocytes.

CT and angiography provided the most helpful information. Hibernomas are fatty, solid and vascular. They appear clearly on CT as contrast-enhancing densities and, in this aspect, CT is superior to USG in localising the mass. This hypervascularity also makes angiography an ideal tool for evaluation, but at the same time can mislead clinicians into suspecting a malignant process. MRI findings usually demonstrate well-defined, heterogeneous mass, slightly or clearly hypo-intense to subcutaneous fat on T1-weighted spin-echo images, with prominent thin low signal bands throughout the tumour [2]. Lesions fail to fully suppress on STIR or fat-saturated T2-weighted images. Hibernomas characteristically demonstrate marked enhancement after administration of gadolinium [5].

Ultra-structural patterns analysis may be useful in differential diagnosis. Hibernomas are circumscribed and with multiple small vacuoles cytoplasm, fat necrosis is not circumscribed and cytoplasm is foamy. Lipoblastoma is typical in children and cells are immature lipoblasts, hibernoma is very rare in children and characterized by brown fat adult cells. Prominent “chicken wire” vascular pattern and mitotic activity is distinctive of liposarcomas. Cross-striated glycogen containing cells are typical in rabdomyoma, stromal chondroids elements are present in chondroid lipoma.

Hibernomas are considered benign. Sometimes they tend to enlarge in size causing compression of the adjacent structures. In these cases complete excision is the treatment of choice [4].

**Differential Diagnosis List:** Hibernoma, Lipoma, Adult rhabdomyoma, Chondroid lipoma, Liposarcoma, Granular cell tumour, Fat necrosis, Lipoblastoma

**Final Diagnosis:** Hibernoma

**References:**

Description: CT image shows a hypointense mass in the left Ilio-psoas muscle belly. Origin:
Department of Oncology, Transplant and New Technologies in Medicine of the University of Pisa
**Description:** 18F-FDG PET image shows the active metabolism of the lesion. **Origin:** Department of Oncology, Transplant and New Technologies in Medicine of the University of Pisa

**Description:** 18F-FDG PET image shows the active metabolism of the lesion. **Origin:** Department of Oncology, Transplant and New Technologies in Medicine of the University of Pisa
Description: FSE T1 coronal image shows well-defined mass, isointense to subcutaneous fat. Origin: Department of Oncology, Transplant and New Technologies in Medicine of the University of Pisa
**Description:** FSE T1 axial image shows well-defined mass with prominent thin low signal bands throughout the tumour. **Origin:** Department of Oncology, Transplant and New Technologies in Medicine of the University of Pisa

**Description:** In T2 TSE axial image the lesion has a high signal as subcutaneous fat. **Origin:** Department of Oncology, Transplant and New Technologies in Medicine of the University of Pisa
Description: The lesion fails to fully suppress on fat-saturated T2-weighted axial image. Origin: Department of Oncology, Transplant and New Technologies in Medicine of the University of Pisa