

## Hibernoma of the chest wall as an incidental finding

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**Section:** Musculoskeletal system

**Area of Interest:** Musculoskeletal soft tissue

**Procedure:** Diagnostic procedure

**Imaging Technique:** MR

**Imaging Technique:** Conventional radiography

**Imaging Technique:** CT

**Special Focus:** Neoplasia Case Type: Clinical Cases

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**Patient:** 28 years, female

### Clinical History:

A 28-year-old woman presented with a paraspinal mass on a conventional chest examination that was performed for suspected pneumonia.

### Imaging Findings:

A conventional radiograph of the chest showed a right-sided, ill-defined, paraspinal mass with scoliosis of the thoracic spine and rib deformities.

A CT scan demonstrated a solid paravertebral mass with inhomogeneous density. It contained fatty components slightly more dense than subcutaneous fat. Within the lesion multiple serpentine, enhancing structures were noted, representing blood vessels. The adjacent osseous structures were deformed, indicating slow growth. There was no mineralisation within the mass.

MR imaging confirmed fatty components with high signal intensity on both T1- and T2-weighted images, but not quite as high as subcutaneous fat. These components were not completely suppressed after fat suppression. Also, multiple streaky areas with signal intensity similar to muscle were visible. After intravenous contrast administration, slow inhomogeneous enhancement was seen within the lesion.

The patient refused surgery due to religious reasons. After 4 years there was almost no growth of the lesion.

### Discussion:

Hibernomas are painless, slow-growing, benign, fatty lesions resembling brown fat. [1] They are most commonly found in the thigh, shoulder, back, neck, chest, arm and, occasionally, in the retroperitoneum. [1] These lesions are rare and often discovered in the 3rd and 4th decades of life. [2]

Macroscopically, the tumours have a yellow to brown colour and may contain hypertrophic vessels. [2] Typical hibernomas are composed of multivacuolated cells resembling brown fat with a small amount of univacuolated white fat cells, but other subtypes can show a higher myxoid content (myxoid type), higher white fat content (lipoma-like type), or display features of spindle cell lipoma (spindle cell type). [1]

The imaging characteristics of hibernomas depend on the histological composition of the lesion. Typical hibernomas are solid, non-mineralised lesions. Compared to subcutaneous fat, they are slightly more dense on CT and slightly less bright on T1- and T2-weighted MR images. Fat suppression may be incomplete, giving them a heterogeneous appearance. [2, 3, 4] Lesions are often intramuscular and do not invade surrounding structures. [4]

Hypervascularity with intratumoral hypertrophic vessels is a distinct feature. Core needle biopsy should, therefore,

be avoided when a hibernoma is suspected. Fine needle aspiration in a less vascularised area is preferred. [2] Hypervascularity also causes moderate radiotracer accumulation on bone scintigraphy and intense uptake on F18-FDG PET, mimicking malignancy. [5, 6]

The differential diagnosis includes low-grade liposarcoma and angiolipoma, which, in contrast with typical hibernoma, contain areas of homogeneous, pure fat. [4, 7] Higher grade liposarcomas could also be considered, however, hibernomas show a more homogeneous internal structure. [4, 7] The branching vessels and flow voids seen in any type of hibernoma are usually not found in other lipomatous tumours, including liposarcoma. [2, 3, 7] Myxoid hibernoma is difficult to differentiate from other myxoid tumours on imaging alone. [1, 2]

Other differential diagnoses include a resolving haematoma, which regresses in time, and clear cell sarcoma of the soft tissues, which appears less bright on T1-weighted images. [8] In children and adolescents lipoblastoma can be also be considered.

Hibernomas do not metastasise or recur after resection. [9] Therefore, when the diagnosis is histologically confirmed, local excision can be considered. [7, 10]

#### TEACHING POINT:

When faced with a slow-growing, well-defined soft-tissue lesion that is located around the shoulder, chest and thighs, and contains prominent vessels and fatty components that are not exactly similar to subcutaneous fat, think of hibernoma as an alternative diagnosis to liposarcoma.

In our case, the lesion fulfilled these criteria. The diagnosis of hibernoma was confirmed by biopsy.

**Differential Diagnosis List:** Hibernoma of the chest wall, Atypical lipomatous tumour, Liposarcoma, Angiosarcoma, Resolving haematoma, Clear cell sarcoma of the soft tissues, Lipoblastoma

**Final Diagnosis:** Hibernoma of the chest wall

#### References:

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## Figure 1

a



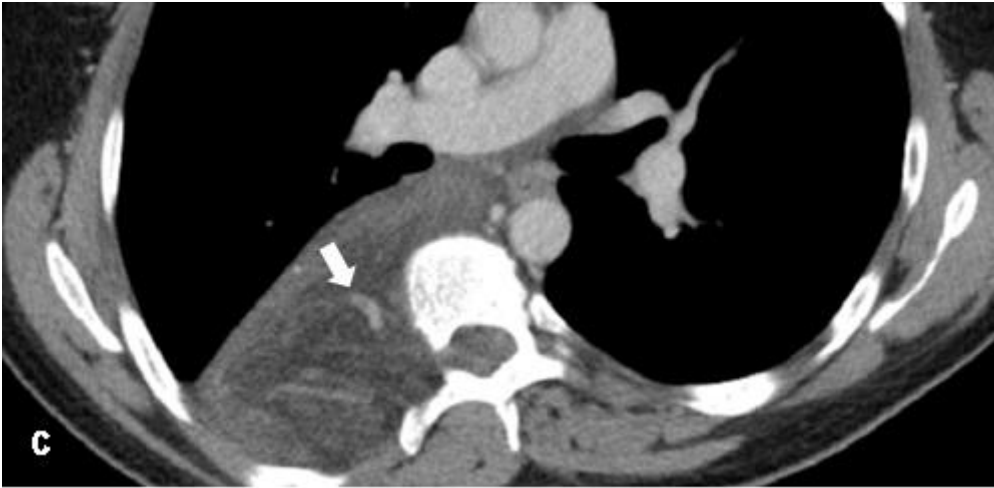
**Description:** Conventional radiograph of the chest (a) shows a right-sided, paraspinal mass with concurrent scoliosis of the thoracic spine and rib deformities. **Origin:** Huijgen WHF, Department of Radiology, LUMC, Leiden, The Netherlands

b



**Description:** Coronal (b) and axial (c) slices of a CT with intravenous contrast demonstrate hypodense areas that are slightly hyperdense compared to subcutaneous fat and multiple vascular structures (arrows). **Origin:** Huijgen WHF, Department of Radiology, LUMC, Leiden, The Netherlands

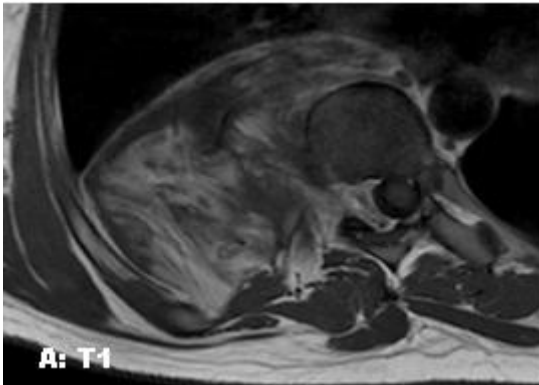
**c**



**Description:** Coronal (b) and axial (c) slices of a CT with intravenous contrast demonstrate hypodense areas that are slightly hyperdense compared to subcutaneous fat and multiple vascular structures (arrows). **Origin:** Huijgen WHF, Department of Radiology, LUMC, Leiden, The Netherlands

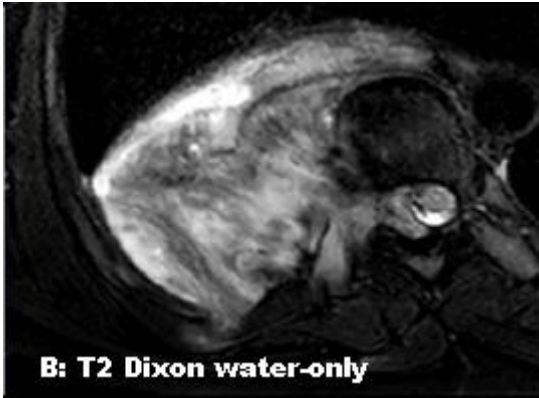
## Figure 2

a



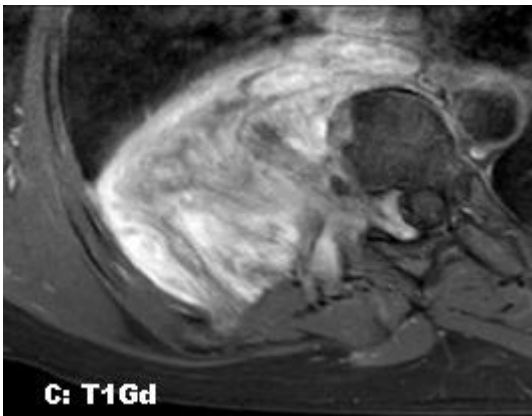
**Description:** T1-weighted images (a, d): fatty components with high signal intensity (although not as high as subcutaneous tissue), soft tissue components with intermediate signal intensity and flow voids in vascular structures (arrows). **Origin:** Huijgen WHF, Department of Radiology, LUMC, Leiden, The Netherlands

b



**Description:** T2-weighted images with fat suppression (b): the fatty components are only partially suppressed and the soft tissue components show high signal intensity. **Origin:** Huijgen WHF, Department of Radiology, LUMC, Leiden, The Netherlands

c



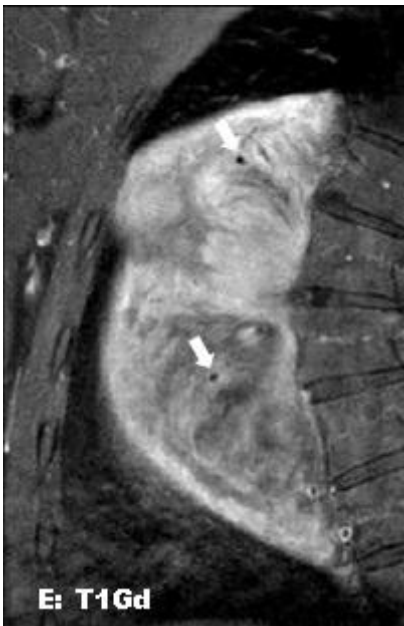
**Description:** T1-weighted images with fat suppression after administration of intravenous contrast (c, e): enhancement of the soft tissue components of the lesion and flow voids in internal vessels (arrows). **Origin:** Huijgen WHF, Department of Radiology, LUMC, Leiden, The Netherlands

d



**Description:** T1-weighted images (a, d): fatty components with high signal intensity (although not as high as subcutaneous tissue), soft tissue components with intermediate signal intensity and flow voids in vascular structures (arrows). **Origin:** Huijgen WHF, Department of Radiology, LUMC, Leiden, The Netherlands

e



**Description:** T1-weighted images with fat suppression after administration of intravenous contrast (c, e): enhancement of the soft tissue components of the lesion and flow voids in internal vessels (arrows). **Origin:** Huijgen WHF, Department of Radiology, LUMC, Leiden, The Netherlands