

Renal angiomyolipoma extending to inferior vena cava

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Section: Uroradiology & genital male imaging

Area of Interest: Kidney Veins / Vena cava

Procedure: Diagnostic procedure

Imaging Technique: MR

Special Focus: Neoplasia Case Type: Clinical Cases

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Patient: 49 years, female

Clinical History:

A 49-year-old female patient reported flank pain, for about two years, with recent aggravation. The patient reported also a single episode of haematuria. No other signs or symptoms were present and no relevant personal medical history was found. Physical examination and blood work were normal.

Imaging Findings:

Due to the symptoms the patient performed renal ultrasound which presented a large and heterogeneous hyperechoic lesion within and apparently extending beyond the left kidney.

In order to adequately characterise the lesion, a MR imaging was performed, confirming the presence of a well defined renal mass, measuring 8x6x3.4cm, within the renal parenchyma and renal sinus. The mass was relatively homogeneous, presenting high signal intensity in T1 sequences (Fig 1 a, b) and intermediate signal in T2 sequences (Fig 2 a, b), with signal loss in fat-suppression sequences (Fig 1c and 2c). After gadolinium administration the lesion did not show significant enhancement (Fig 3).

The lesion extended beyond the renal sinus into the left renal vein (Fig 4), reaching and growing through the inferior vena cava, extending to the level of the liver (Fig 5).

The diagnosis proposed was of renal angiomyolipoma with extension into the inferior vena cava, which was confirmed after radical nephrectomy.

Discussion:

Angiomyolipoma is the most common benign renal mesenchymal neoplasm [1], being in the majority of cases sporadic, appearing as an isolated lesion, more frequently occurring from fourth to sixth decade, more commonly in female patients [1]. These lesions can also appear associated with tuberous sclerosis, generally multiple and occurring more early, between third to fourth decades [1].

Histologically, in the classic form, these tumours are composed of different amounts of adipose tissue, smooth muscle and blood vessels [1-3], having at gross pathologic examination a spherical, lobulated morphology, from yellow to gray, secondary to the amount of adipose tissue [1-3]. A second less common histologic presentation is the epithelioid form, more associated with tuberous sclerosis and with a more aggressive behaviour [1, 3]. This histologic variant generally does not present with macroscopic fat, being less distinguishable from renal cell carcinoma at imaging [3].

Renal angiomyolipomas generally have a benign behaviour with limited growth to kidney and perirenal space,

however, in rare cases, as the one presented, can extend to inferior vena cava.

Angiomyolipomas are usually asymptomatic, being found incidentally at imaging. Nevertheless, depending on its size, location and extension, they can manifest with flank pain, haematuria and/or palpable mass [1, 3]. Haemorrhage and renal failure can occur as complications. Occurrence of haemorrhage is related to the size of the tumour and especially to the presence of intra-tumoral aneurysms [2], being more probable in tumours with more than 4cm and with aneurysms larger than 5mm [1, 2].

The appearance of renal angiomyolipomas at imaging is dependent on the tumour size and the different amount of tissues, especially adipose tissue [3].

At CT they appear as homogenous/heterogenous lesions, depending on the small or large size, with low attenuation areas (<-20UH). At MR imaging they present with areas of high signal intensity in T1 and T2 weighted sequences, with signal loss in fat-suppression sequences.

Differential diagnosis can include renal cell carcinoma and perirenal liposarcoma. The first rarely can contain fat, which usually can be due to engulfed sinus or perirenal fat. When renal angiomyolipoma extends into perirenal space, liposarcoma must be considered, being the presence of renal parenchymal defect or aneurysms within the lesion more suggestive of angiomyolipoma [3].

Majority of tumours can be followed conservatively when the diagnosis is achieved by imaging and they are asymptomatic. For lesions larger than 4cm or symptomatic ones, partial or radical nephrectomy, according to lesion size and location, can be a solution.

Differential Diagnosis List: Renal angiomyolipoma extending to inferior vena cava, Renal cell carcinoma, Perirenal liposarcoma, Renal metastase

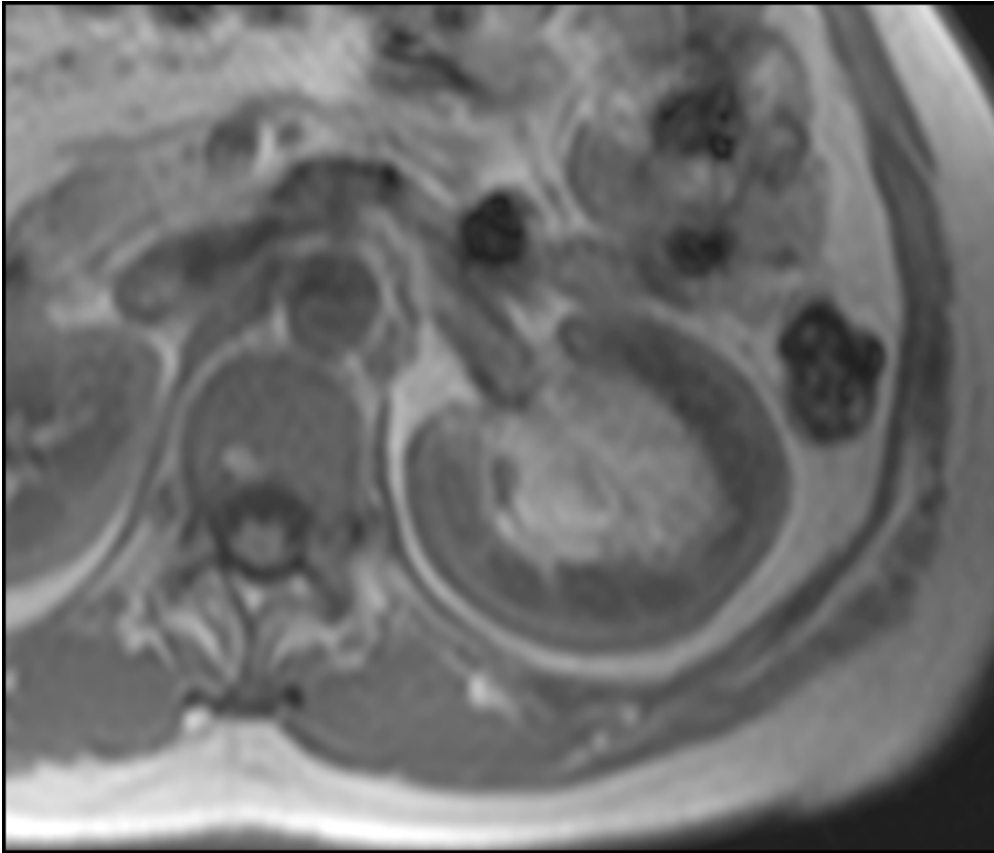
Final Diagnosis: Renal angiomyolipoma extending to inferior vena cava

References:

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Figure 1

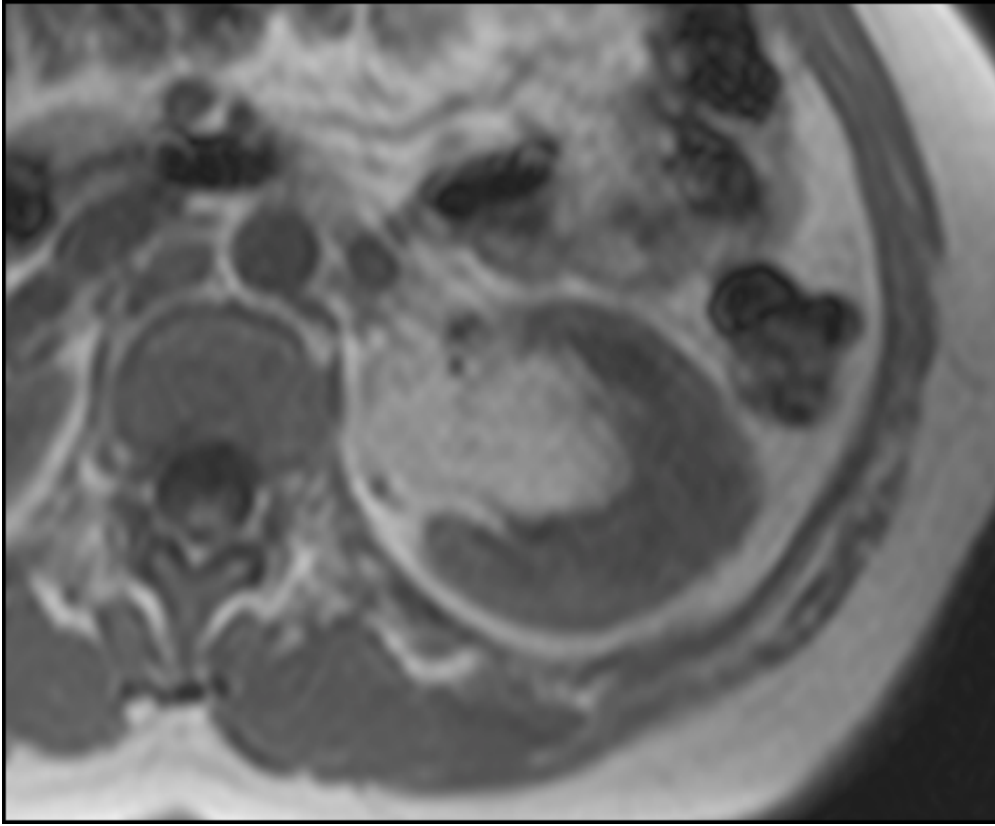
a



Description: Axial T1-weighted imaging without (a,b) and with (c) fat suppression demonstrating well defined renal mass, with high signal intensity, presenting signal loss in fat-suppression sequence.

Origin: Department of Radiology, Centro Hospitalar de Coimbra, Portugal

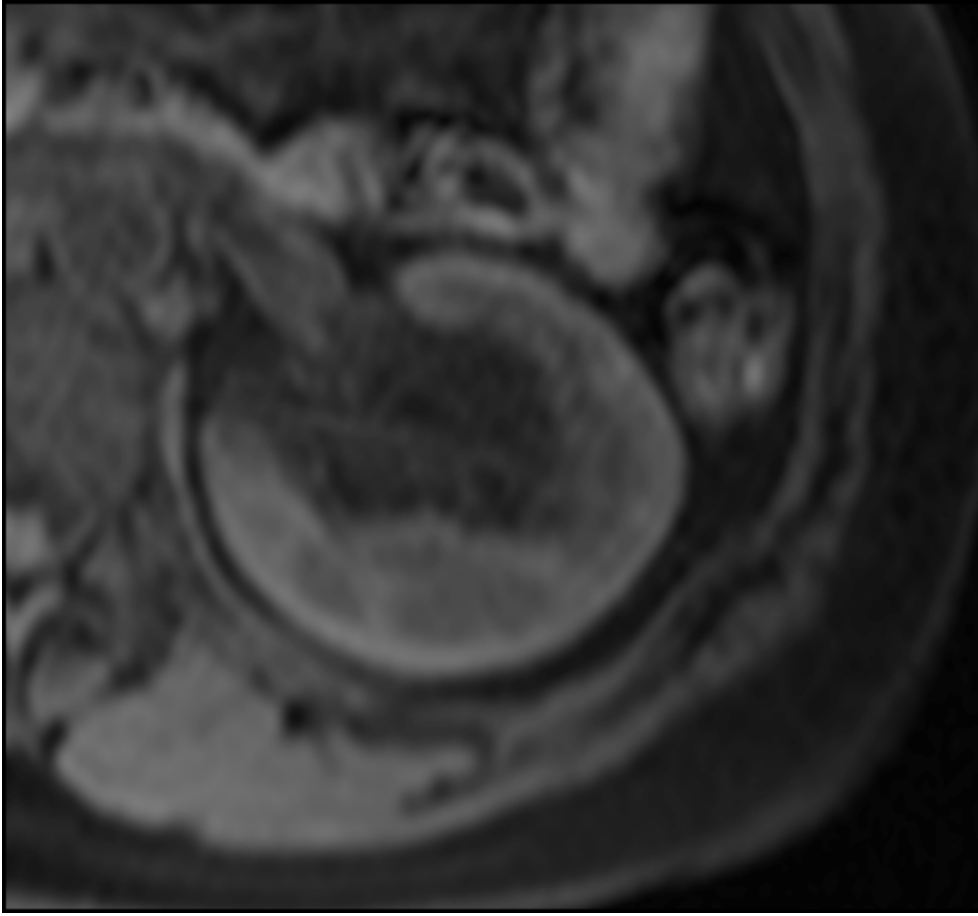
b



Description: Axial T1-weighted imaging without (a,b) and with (c) fat suppression demonstrating well defined renal mass, with high signal intensity, presenting signal loss in fat-suppression sequence.

Origin: Department of Radiology, Centro Hospitalar de Coimbra, Portugal

c

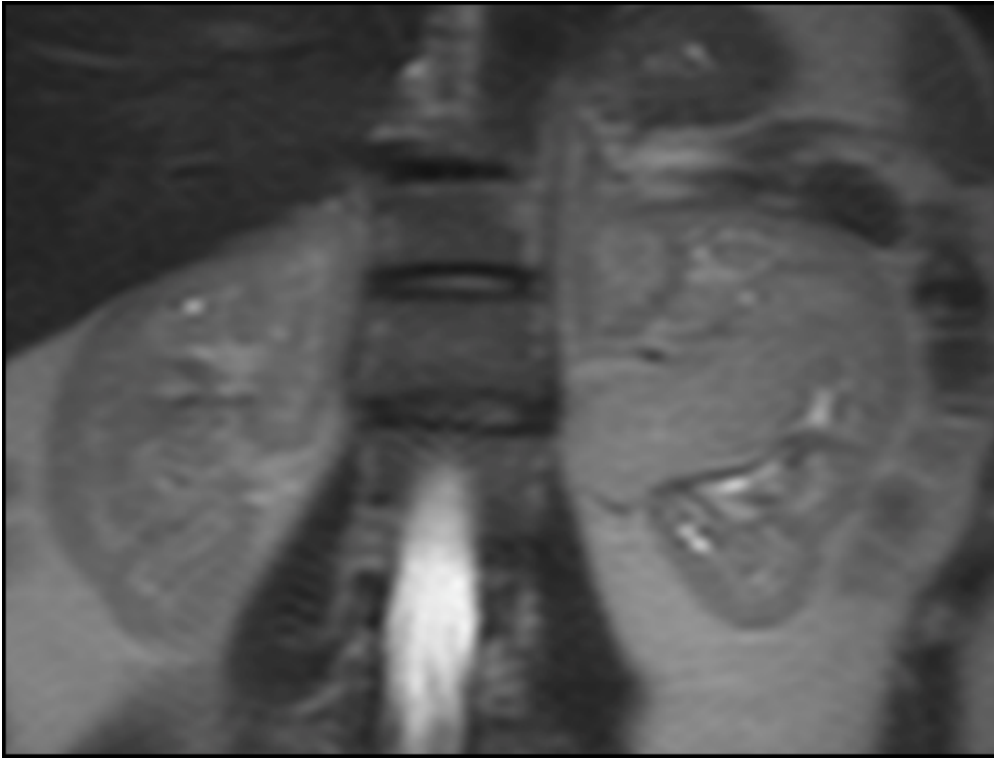


Description: Axial T1-weighted imaging without (a,b) and with (c) fat suppression demonstrating well defined renal mass, with high signal intensity, presenting signal loss in fat-suppression sequence.

Origin: Department of Radiology, Centro Hospitalar de Coimbra, Portugal

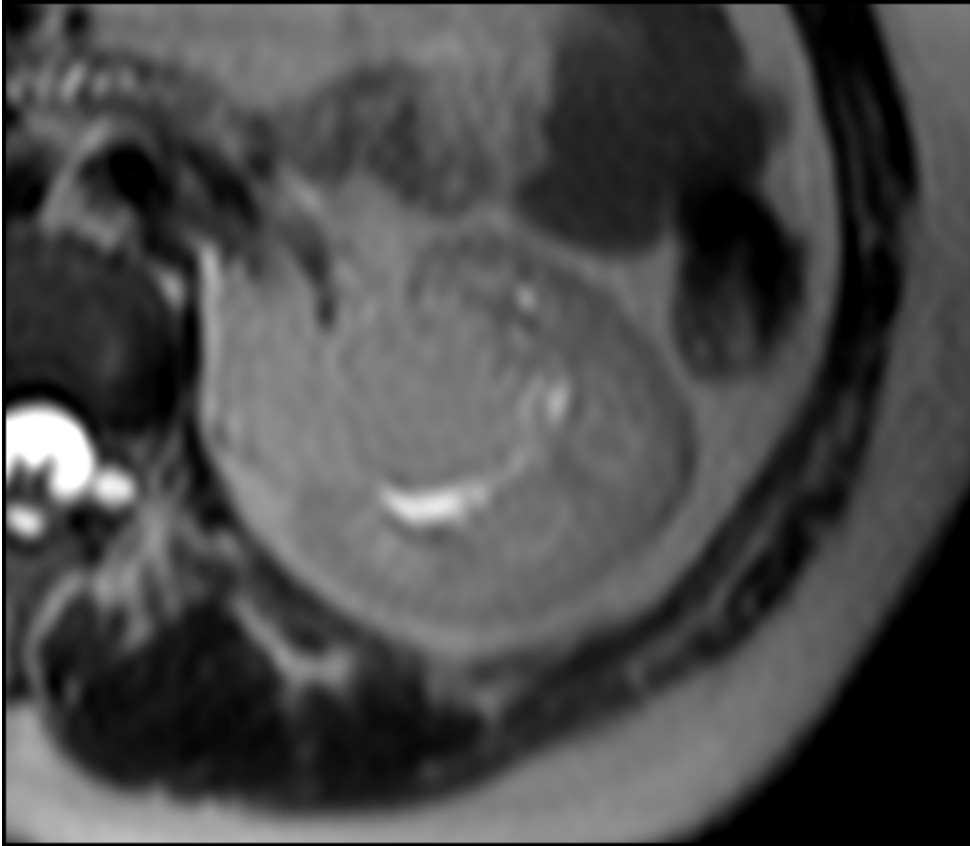
Figure 2

a



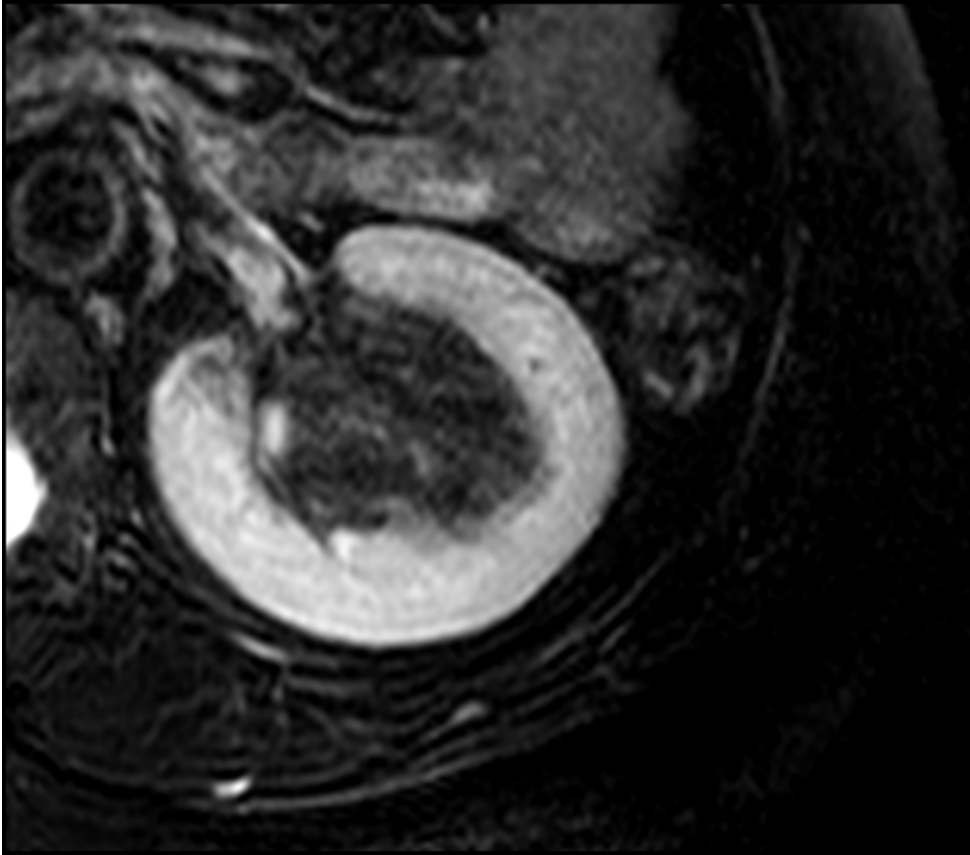
Description: Coronal (a) and axial (b) T2 weighted imaging without and with (c) fat suppression demonstrating well defined renal mass, with intermediate signal intensity, presenting signal loss in fat-suppression sequence. **Origin:** Department of Radiology, Centro Hospitalar de Coimbra, Portugal

b



Description: Coronal (a) and axial (b) T2 weighted imaging without and with (c) fat suppression demonstrating well defined renal mass, with intermediate signal intensity, presenting signal loss in fat-suppression sequence. **Origin:** Department of Radiology, Centro Hospitalar de Coimbra, Portugal

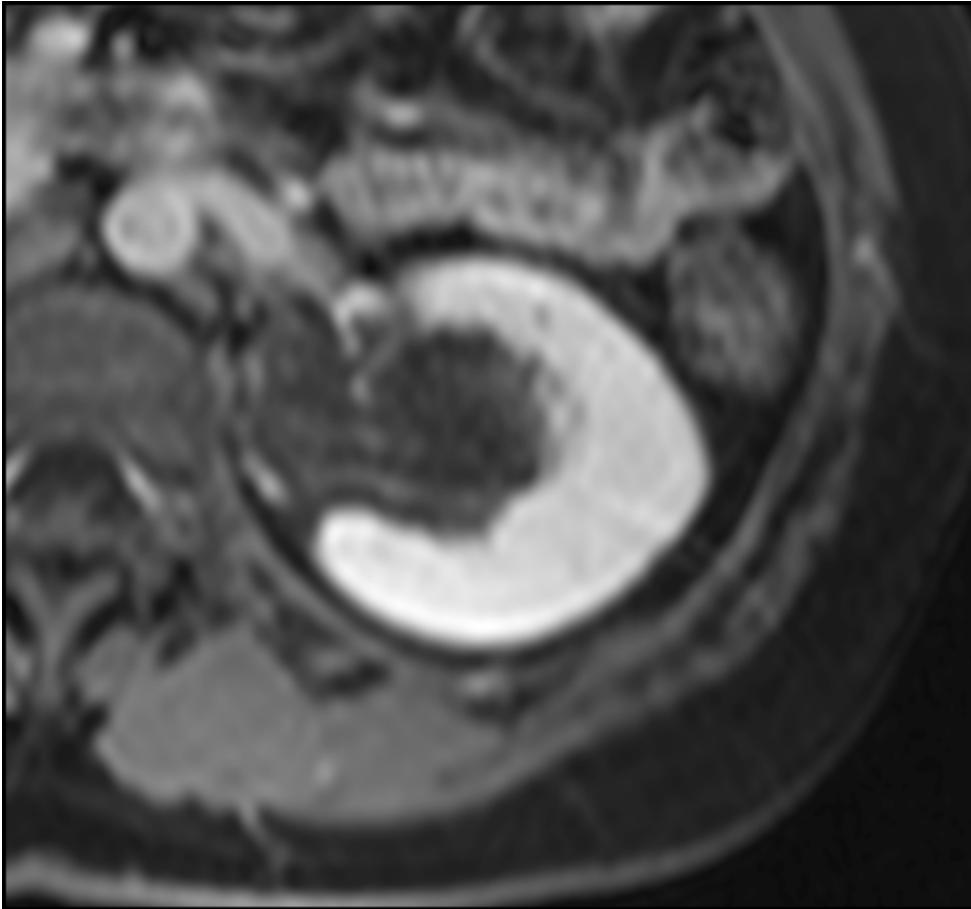
c



Description: Coronal (a) and axial (b) T2 weighted imaging without and with (c) fat suppression demonstrating well defined renal mass, with intermediate signal intensity, presenting signal loss in fat-suppression sequence. **Origin:** Department of Radiology, Centro Hospitalar de Coimbra, Portugal

Figure 3

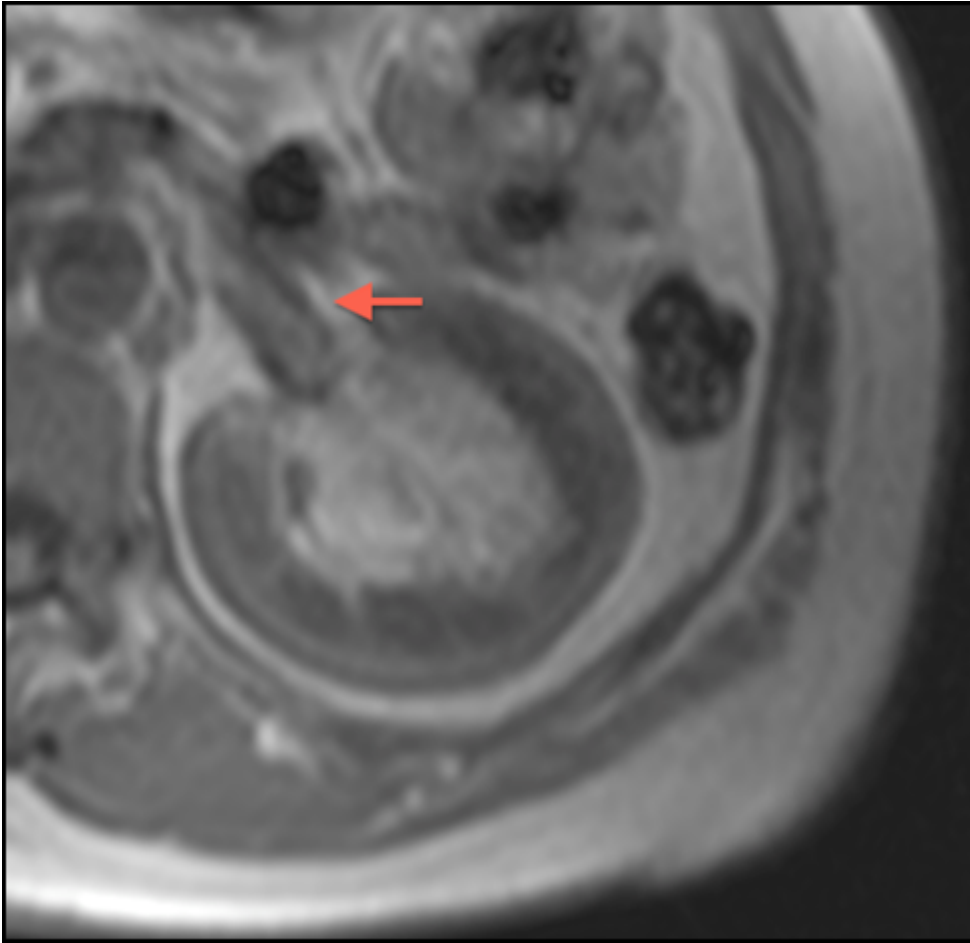
a



Description: Axial T1-weighted imaging with fat suppression after gadolinium administration, without significant enhancement. **Origin:** Department of Radiology, Centro Hospitalar de Coimbra, Portugal

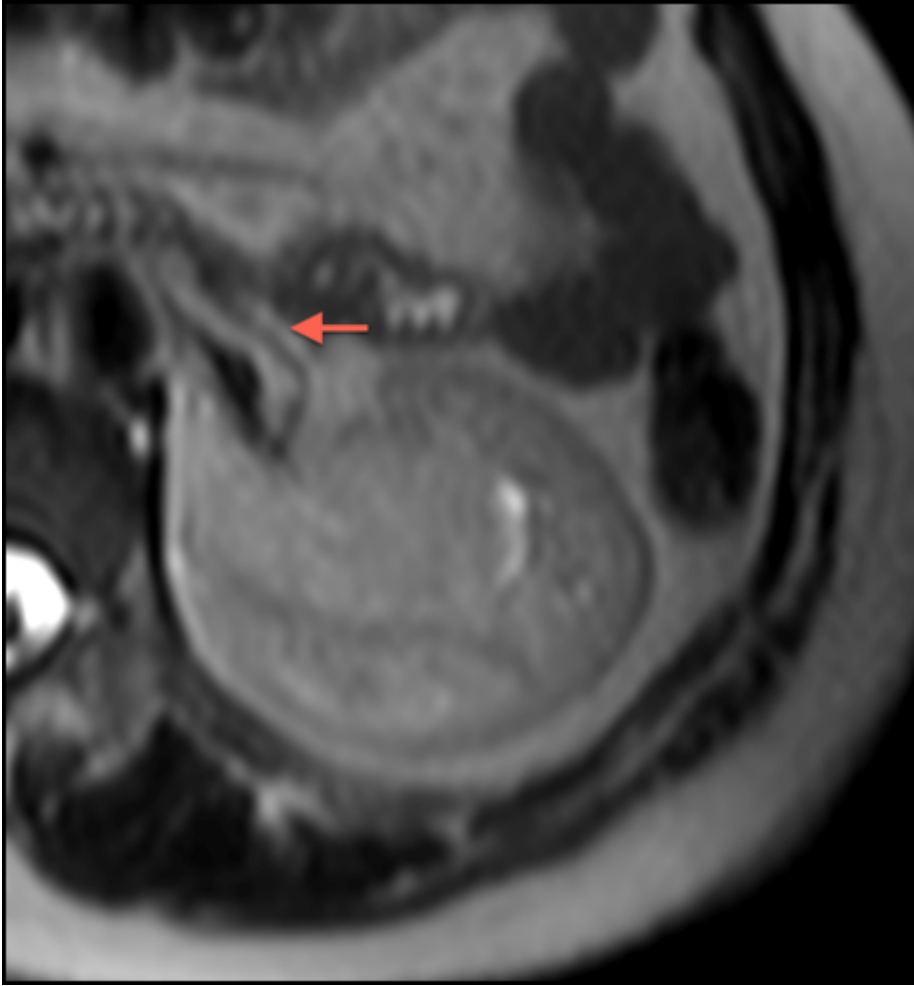
Figure 4

a



Description: Axial T1 (a) and T2 weighted images (b) presenting extension of lesion to left renal vein (arrow). **Origin:** Department of Radiology, Centro Hospitalar de Coimbra, Portugal

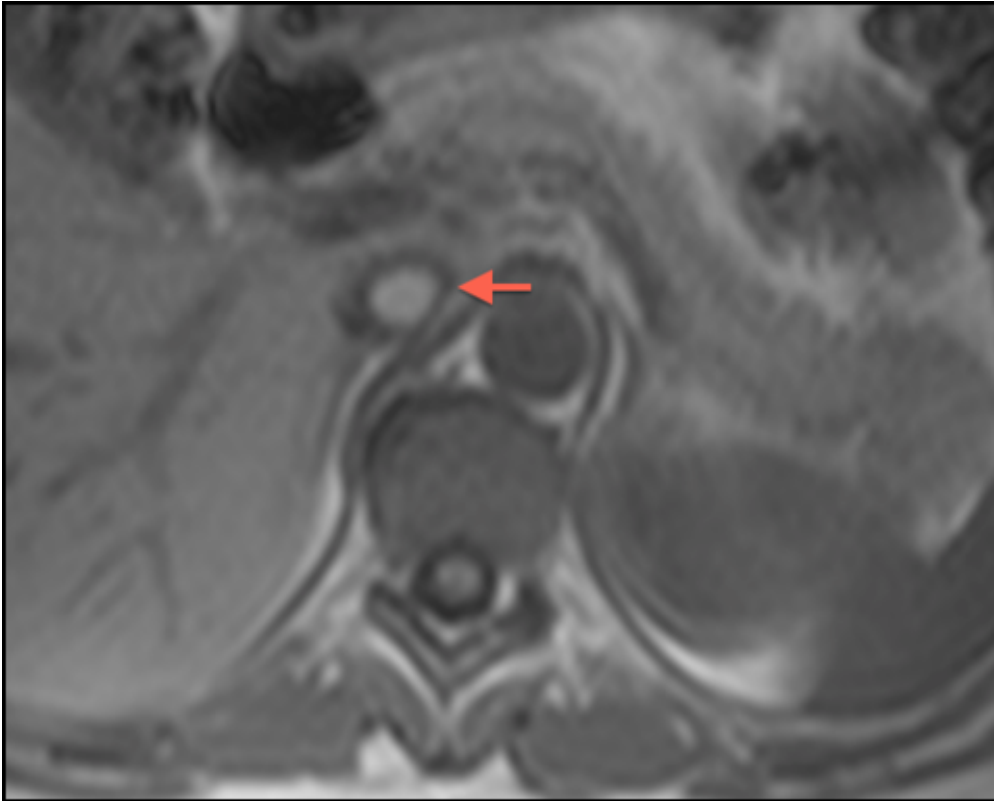
b



Description: Axial T1 (a) and T2 weighted images (b) presenting extension of lesion to left renal vein (arrow). **Origin:** Department of Radiology, Centro Hospitalar de Coimbra, Portugal

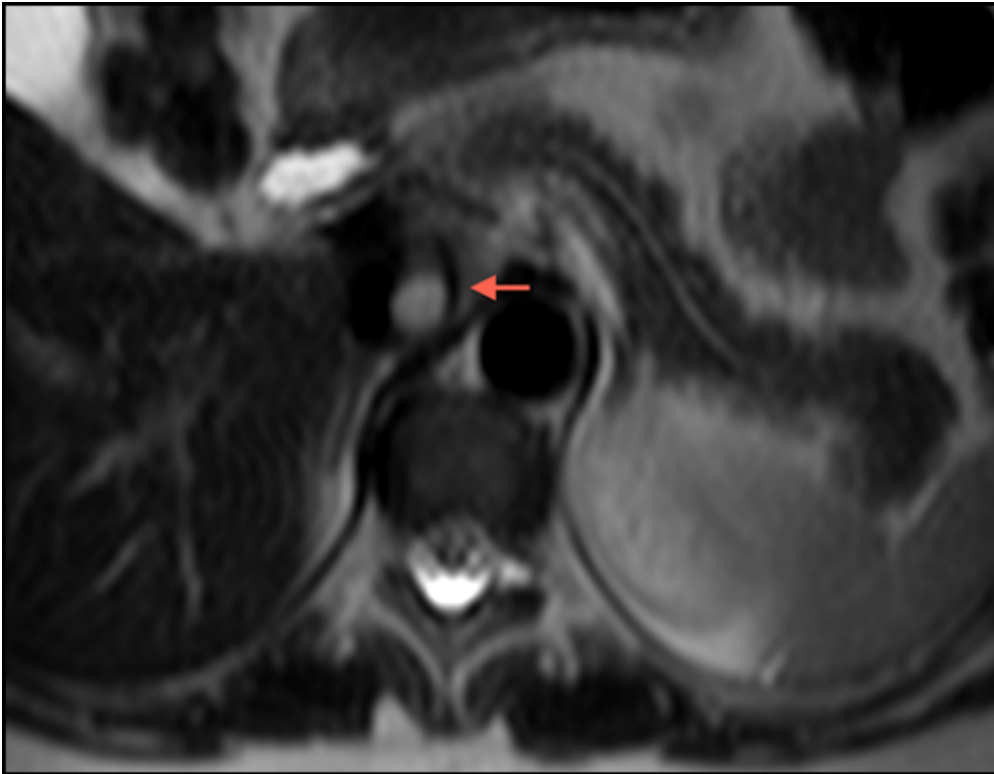
Figure 5

a



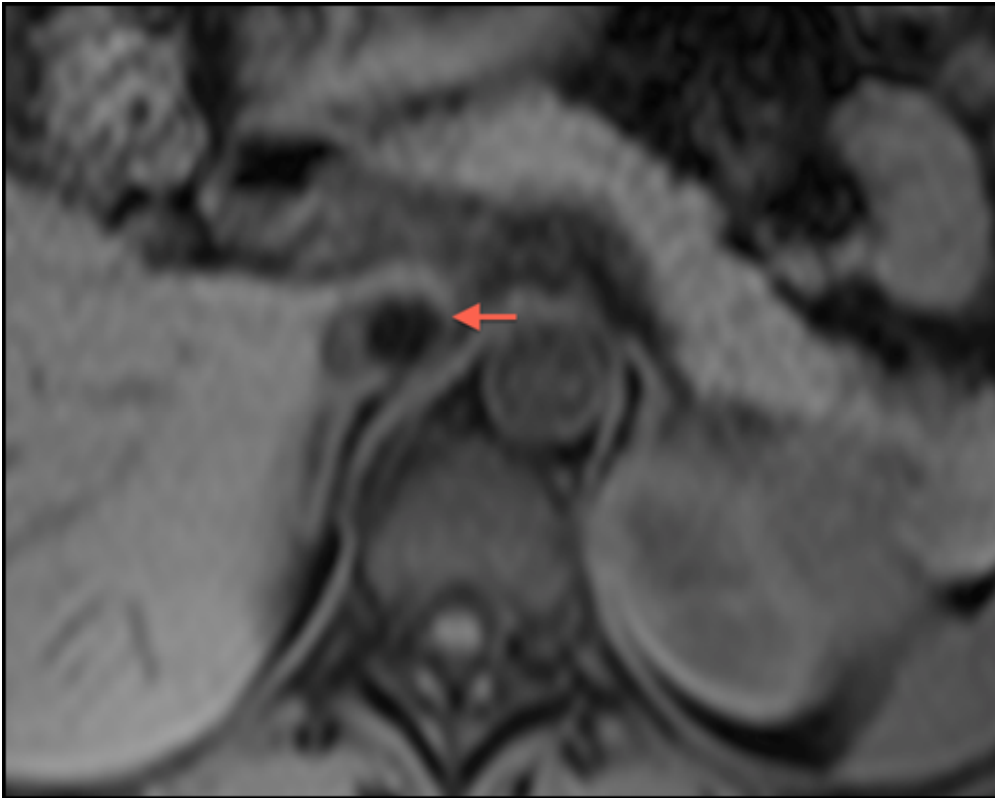
Description: Axial T1 (a), T2 (b) and T1 weighted images with fat suppression (c) demonstrating the lesion within within inferior vena cava (arrow). **Origin:** Department of Radiology, Centro Hopsitalar de Coimbra, Portugal

b



Description: Axial T1 (a), T2 (b) and T1 weighted images with fat suppression (c) demonstrating the lesion within within inferior vena cava (arrow). **Origin:** Department of Radiology, Centro Hopsitalar de Coimbra, Portugal

c



Description: Axial T1 (a), T2 (b) and T1 weighted images with fat suppression (c) demonstrating the lesion within within inferior vena cava (arrow). **Origin:** Department of Radiology, Centro Hopsitalar de Coimbra, Portugal