Clinical History:

A 71-year-old woman was referred to our hospital because of severe low back pain radiating to the right leg until the heel with associated paresthesias, dysesthesia and hyposthenia with impossibility of walking for two months. She also complained of having recently developed abdominal pain and urinary and faecal incontinence.

Imaging Findings:

Fig. 1: Coronal (a) and sagittal (b) T2-weighted MRI images showing a retroperitoneal soft tissue mass with heterogeneous, mostly high signal intensity, with hypointense crisscrossing septa, emerging 12 mm from the anus up to the first sacral metamer with destruction of the coccyx and compression of bladder and rectum.

Fig. 2: (a) The mass reveals also heterogeneous signal intensity on T1-weighted axial MRI image. The tumour extends into the right gluteus muscle appearing with pseudopodia or interdigitation. (b) Gadolinium-DTPA enhanced T1-weighted image reveals inhomogeneous enhancement throughout the mass.

Fig. 3: Spectroscopy analysis characterized by predominance of Choline and Lipids peaks, and reduction of Creatine peak.

Fig. 4: Histological examination in chordoma, haematoxilin and eosin (H & E, x 20). Photomicrograph shows morphology of cell cords and lobules that were separated by myxoid and chondroid-like stroma.
Discussion:

Sacrococcygeal chordoma is an extremely rare primary malignant tumour of the bone [1]. The tumour rarely invades the rectal wall because the periosteum and presacral fascia are tough membranes that resist transgression by the tumour [2]. Epidemiologically, the median survival has been estimated to be approximately 6 years, with a survival rate of 70% at 5 years, falling to 40% at 10 years [3]. If death is a late event, the patient’s quality of life generally is compromised because of the anatomic location of the tumour and its progressive invasion of the adjacent structures [4].

The primary curative treatment of sacrococcygeal chordomas includes complete surgical excision of the tumour. Postoperative adjuvant radiation therapy can reduce the tumour recurrence rate. Since incomplete resection invariably leads to recurrences and distant metastases, complete tumour removal is important and offers the best chance for cure [5]. Furthermore, the surgical approach is difficult because of the site of this tumour and its anatomical relation with surrounding tissues and organs; preservation of neural structures is often a challenge [6]. If the lesion can be removed while the upper three sacral nerves on one side and two on the other the other side are preserved, the patient will have close to normal function. However, loss of all the first nerve root bilaterally results in rectal and urinary incontinence and in impaired sexual function [7].

There are thus great demands placed on the preoperative imaging of sacrococcygeal chordomas. Accurate preoperative assessment of the bulk and local extension of sacrococcygeal chordoma is important in successful surgical resection for a better prognosis.

Sacrococcygeal chordoma is poorly accessible by conventional radiography. Plain radiographs may show nonspecific destruction of the involved sacrum but are not useful in assessing the soft tissue extension of the tumour. CT has been the primary method for the evaluation of the sacrococcygeal chordoma but, although it provides adequate demonstration of the bulk of the tumour, delineating tumour extension and soft tissue mass invasion, especially muscle invasion could be misleading [8]. Magnetic resonance imaging has been used for the diagnosis of intracranial chordomas [9, 10] but reports of its use in the diagnosis of sacrococcygeal chordomas are limited [8, 6, 10-16]. Magnetic resonance imaging offers several potential advantages in the evaluation of these lesions both for pre-operative assessment and especially for the diagnosis of recurrences.

Rosenthal et al. showed that MRI has superior contrast resolution in the demonstration of soft tissue sacrococcygeal lesions invasion [7].

Differential Diagnosis List: Sacrococcygeal chordoma, Seroma, Chondrosarcoma, Ependymoma

Final Diagnosis: Sacrococcygeal chordoma

References:

Figure 1

**Description:** Coronal (a) and sagittal (b) T2-weighted MRI images showing a retroperitoneal soft tissue mass emerging 12 mm from the anus up to the first sacral metamer with destruction of the coccyx.

**Origin:** Department of Diagnostic Imaging, Molecular Imaging, Interventional Radiology, Nuclear Medicine and Radiotherapy
Description: (a) The mass reveals also heterogeneous signal intensity on T1-weighted axial MRI image. The tumour extends into the right gluteus muscle.  
(b) Gadolinium-DTPA enhanced T1-weighted image reveals inhomogeneous enhancement throughout the mass. Origin: Department of Diagnostic Imaging, Molecular Imaging, Interventional Radiology, Nuclear Medicine and Radiotherapy
Description: Spectroscopy analysis characterized by predominance of Choline and Lipids peaks, and reduction of Creatine peak. **Origin:** Department of Diagnostic Imaging, Molecular Imaging, Interventional Radiology, Nuclear Medicine and Radiotherapy
**Description:** Histological examination in chordoma, haematoxilin and eosin (H & E, x 20). Photomicrograph shows morphology of cell cords and lobules that were separated by myxoid and chondroid-like stroma. **Origin:** Department of Anatomical Pathology Dipartment of biomedicine and prevention. University of Rome "Tor Vergata", Rome, Italy