Intraosseous sacral schwannoma

Case 11095

Published on 05.08.2013

DOI: 10.1594/EURORAD/CASE.11095
ISSN: 1563-4086
Section: Musculoskeletal system
Area of Interest: Musculoskeletal spine
Procedure: Diagnostic procedure
Imaging Technique: MR
Special Focus: Neoplasia Case Type: Clinical Cases
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Patient: 47 years, male

Clinical History:

A 47-year-old male patient presented with a history of low back pain radiating to the right knee for 1 year. Physical examination showed posterolateral right upper leg numbness. The patient's past medical history was unremarkable.

Imaging Findings:

Computer tomography of the lumbar spine (Figure 1) was performed to exclude disc herniation. Sagittal reformatted images revealed osteolysis in the sacrum. Subsequent Magnetic Resonance Imaging (MRI) examination confirmed a very large intraosseous sacral tumour with presacral extension. The lesion was of intermediate signal intensity (SI) on T1-weighted images (WI) (Figure 2). On T2-WI images (Figures 3-4), the mass was of heterogenous SI, with intraloesional areas of high SI, corresponding to cystic or necrotic changes. Sagittal T1-WI images after administration of Gadolinium contrast (Figure 5) showed heterogeneous enhancement. An open biopsy yielded the diagnosis of an intraosseous sacral schwannoma (ISS). Due to the size and extension of the lesion, risk of neurological damage at excision was estimated to be high. The patient preferred a conservative approach. Follow-up MRI examination (Figure 6) demonstrated slight growth of the tumour. A very large bladder was present, in keeping with a neurogenic bladder.

Discussion:

Schwannomas, otherwise known as neurilemmoma, are most often benign, encapsulated neoplasms arising from peripheral nerve sheath cells [1]. They are mostly diagnosed between the age of 20 to 50 years, without sex predilection [1]. The most common locations for schwannomas are the head and neck region and the flexor surfaces of the extremities [1]. Sacral schwannomas are rare and occur in less than 1-5 % of all spinal schwannomas. Based on localisation we can distinguish three types: spinal, retroperitoneal and intraosseous sacral schwannomas, the latter being the rarest type [2]. Sacral schwannomas are slowly growing and they may remain asymptomatic for a long period of time. They displace adjacent structures rather than invading them. Symptoms occur usually as a result of mass effect on adjacent structures. In case of ISS, low back pain is more common than neurological symptoms. Large ISSs often show cystic or necrotic areas, probably as a result of ischaemia [2]. Although histopathological examination is mandatory for final diagnosis of ISS, radiological examinations can be useful both for potential lesion characterisation and local tumour staging. Small intrasacral lesions are often not well appreciated on conventional radiographs, due to superposition of adjacent bowel gas. Computer tomography is more accurate in detecting small osteolytic lesions and is particularly useful in the pre-operative assessment of the degree of bone destruction. The lesion rarely contains calcifications and may enhance heterogeneously. MRI is the best diagnostic tool for evaluation of local tumour extension within the adjacent soft tissues. Lesions are of low to intermediate SI on T1-WI and of intermediate to high SI on T2-WI. High T2-WI SI areas may be present in large lesions due to
cystic/necrotic changes. Low SI foci may correspond to intralesional calcifications. The soft tissue components show vivid, homogeneous enhancement after intravenous administration of Gadolinium contrast [1, 2].

The main differential diagnoses are chordoma, giant cell tumour, chondrosarcoma and plasmocytoma [3]. Both giant cell tumour and plasmocytoma may have a relatively low SI on T2-WI, whereas chondrosarcoma is of high T2-signal with a lobular appearance due to cartilage lobules. Chordoma often contains extensive calcifications.

Surgery is the treatment of choice for ISS [4], but complete excision often causes damage to the sacral nerves. Therefore watchful waiting or intracapsular extirpation has been used as an alternative. This approach causes less neurological complications and is associated with a low recurrence rate. Radiotherapy has been performed as well, but its effectiveness is controversial [2].

**Differential Diagnosis List:** Intraosseous sacral schwannoma, Chordoma, Chondrosarcoma, Plasmocytoma, Metastasis, Lymphoma, Giant cell tumour

**Final Diagnosis:** Intraosseous sacral schwannoma

**References:**

Description: MRI after 1 year shows slight enlargement of the presacral component (arrow). Also note the enlarged, neurogenic bladder (asterisk). Origin: Department of Radiology, AZ Sint-Maarten Duffel, Belgium
**Description:** There is heterogeneous enhancement of the lesion. The solid portions of the lesion enhance, whereas the cystic parts (arrows) show no enhancement. **Origin:** Department of Radiology, AZ Sint-Maarten Duffel, Belgium
Description: The mass is of heterogeneous signal, containing low SI foci and high SI areas (consistent with necrosis or cystic changes) (asterisk). Origin: Department of Radiology, AZ Sint-Maarten Duffel, Belgium
Description: The lesion is of heterogeneous signal, containing low SI foci and high SI areas (consisting with necrosis or cystic changes) (arrows). Origin: Department of Radiology, AZ Sint-Maarten Duffel, Belgium
Description: The lesion involves 4 sacral segments and is isointense to muscle. Note presacral extension (arrows). Origin: Department of Radiology, AZ Sint-Maarten Duffel, Belgium
Description: Note osteolysis in the sacral bone (asterisk). Origin: Department of Radiology, AZ Sint-Maarten Duffel, Belgium