CASE REPORT

Solitary lumbar osteochondroma presenting with spinal cord compression

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SUMMARY

We report a case of a middle-aged woman with a solitary osteochondroma of the L2 right lamina with intraspinal extension and spinal cord compression. The case is unusual in terms of localisation and age at clinical presentation. In fact, spinal osteochondromas as solitary lesions—especially when affecting the lumbar segment—are rare tumours of a maturing adolescent skeleton, infrequently affecting the neurological structures, because most of the lesions grow out of the spinal canal. Although unusual, they should be considered in the differential diagnosis. Prompt and accurate radiological investigations are important in planning appropriate management. Surgical total excision is the best treatment modality to remove spinal cord and/or nerve root compression, and to avoid the risk of recurrence or malignant transformation.

BACKGROUND

We describe a rare manifestation of a rare solitary osteochondroma of the lumbar spinal canal in a middle-aged woman, surgically treated with a full neurological recovery and without recurrence after 8 months of operation.

CT and MRI played a crucial role in identifying the lesion as well as in choosing the therapeutic strategy.

CASE PRESENTATION

A 56-year-old woman referred a long-standing history of subcontinuous perineum pain and paraesthesiae. In the past 2 months, she reported of acute onset of right-sided lumbo—crural pain, diagnosed elsewhere and unsuccessfully treated as kidney colic. On admission the neurological examination detected a slight weakness of the right extensor communis and extensor hallucis longus, hypoaesthesia in the right L2–L3 and L4 territory, absence of patellar reflex on the right.

INVESTIGATIONS

Lumbar MRI showed compression of the cord from behind by a protruding mass at L2–L3 level (figure 1). Subsequent CT scan revealed a large bony mass arising from the right L2 lamina and facet (figure 2), and encroaching the spinal canal. Radiographic features suggested the presence of osteochondroma.

DIFFERENTIAL DIAGNOSIS

CT and MR findings are almost distinctive for osteochondroma, excluding other benign cartilage bone neoplasms (ie, osteoblastoma).

In the differential diagnosis, mainly chondrosarcoma should be considered, if the cartilaginous cap is more than 3 cm thick, cortical irregularity is detected and popcorn-like calcifications are found.

TREATMENT

The patient underwent surgical treatment. An intraspinal extradural bony mass arising from the right L2 lamina and involving the facet joint was detected to compress the spinal cord. The entire lesion was removed en bloc via a right interlaminar approach. The excision was made delimiting the lesion from the surrounding bone tissue with diamond burr drill to avoid compression of the cord by the use of surgical instruments under the lesion.

Peroperatively, neural structures appeared severely compressed but they were not adherent to the mass. After the tumour resection the spinal cord was fully decompressed. Fusion procedure was not required.

The histopathological diagnosis of the lesion was osteochondroma (figure 3). Postoperative course was uneventful and the patient was free of pain. Whole plain radiographs of the body revealed no other such lesions on the skeleton.

OUTCOME AND FOLLOW-UP

At discharge her neurological deficit was significantly improved.

At 8 months follow-up neurological examination was normal. CT (figure 4) and MRI (figure 5) investigations demonstrated total mass removal.

DISCUSSION

Osteochondromas (OCs), also known as osteocartilaginous exostoses, are the most common benign tumours of the bone, accounting for 10–15% of all osseous neoplasms and 20–50% of benign bone tumours.^{1 2}

They can occur in either solitary or multiple forms. Multiple lesions are considered to be associated with hereditary multiple exostosis, an autosomal dominant condition with variable penetrance; they account for about 12% of all OC cases.³ Whether solitary or multiple, OCs chiefly arise from the metaphysis of the long bones in young adults, and only rarely affect the spine.^{4–12} In fact, the vertebral involvement of solitary OCs (SOCs) is between 1% and 4%,¹³ whereas the vertebral involvement of multiple OCs is about 7–9%.^{1 4 12 14}

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Figure 1 Axial (A) soft tissue window, (B) bone window, sagittal (C) and coronal (D) CT scan of L2 through L3 showed a bony lesion arising from the right facet-lamina of L2 vertebra, encroaching the spinal canal. The cortex and the spongiosa of the lesion were contiguous with the underlying bone.

Figure 2 Lumbar sagittal (A) and axial (B) T2-weighted MRI revealed compression of the cord from behind by the protruding mass without signal change in the conus.

Moreover, vertebral SOC involves the lumbar segment only in 6% of cases (Anderson M), with cervical segment being the preferred site.⁷

Vertebral OCs causing myelopathy and/or radiculopathy are even rarer, these lesions being usually asymptomatic (70% in the solitary form, 50% in the multiple form).

Figure 3 Histopathological examination with H&E stain revealed a typical finding of osteochondroma with the fibrocartilaginous cap and underlying bone.

The majority of OCs arises from the posterior elements of the vertebra and as a secondary ossification centre and grows to outside the spinal canal.

Since the tumours have a slowly-growing nature, the clinical symptoms may be indolent or unrecognised until significant spinal cord compression develops. Spinal OCs are progressively expanding lesions during the growth period of the skeleton and the lesions often become quiescent when the epiphyses of secondary ossification centres of the vertebral column are closed. Thus, they usually become symptomatic during the second and third decades of life: sporadic forms occur around the age of 30 years, though hereditary forms are seen at earlier ages.

As emerging from the literature, spinal OCs are rarely seen in elderly patients as the case here described.^{3 9 15} The pathological mechanisms governing their development in this age group are still not settled. Some postulate that spinal OCs may continue to grow after the completion of skeletal maturity. Others consider that degenerative changes of the column may contribute to the initiation of symptoms.

OCs are exophytic outgrowths from the parent bone surface that are composed of cortical and medullary bone with an overlying hyaline cartilage cap.

Radiological assessment is usually diagnostic for OCs located in extremities but not for spinal ones; therefore, the most reliable diagnostic tools for OCs are CT and MRI.

Figure 4 Postoperative axial (A) soft tissue window, (B) bony window, sagittal (C) and coronal (D) CT scan at the same level of figure 1 showed total removal of the mass.

Figure 5 Postoperative lumbar sagittal (A) and axial (B) T2-weighted MRI showed complete cord decompression.

CT findings may be characterised by a paraspinal, dumbbell or eccentrically located, round, sharply outlined mass in the spinal canal with bonelike density with scattered calcifications and osteosclerotic changes in neighbouring bone and lacking contrast enhancement. Commonly, MRI demonstrates the signal intensity of bone marrow in the centre of the mass and peripheral hypointense rim suggestive of ossification, well depicting the relationships of the mass with neural elements.

In our case CT of the lumbar spine exhibited an irregular shaped osseous mass with sclerotic margin that projected from the inner aspect of the exostotic right lamina-facet of L2 into the spinal canal. MRI detected the intermediate intensity core of the tumour—similar to that of bone marrow—surrounded by a ring-like low-intensity area corresponding to ossification, well depicting the level and the extent of neural compression. The lesion was not enhanced by gadolinium. No malignant aspects were seen. Although rarely occurring in the lumbar spine as well as in aged patients, osteochondroma was suspected. Neurological and radiographical features considered, we planned and achieved the total surgical removal to relieve the cord-root compression as well as to prevent recurrence, without considering preoperative biopsy.

In fact, the treatment of choice for symptomatic lesions should be the total surgical removal while asymptomatic SOCs can be followed conservatively due to a low rate of malignant transformation.

Learning points

- ▶ Although osteochondromas (OCs) rarely affect the lumbar spine and cause neurological symptoms, they should be considered in the differential diagnosis to plan the proper therapeutic modality.
- ▶ CT and MRI are the best procedures for detecting the lesion, for assessing the cord-root impairment, and thus for evaluating the therapeutic options.
- ▶ The treatment of choice of symptomatic spinal OCs consist of total surgical removal, if possible, to avoid the risk of recurrence and malignant transformation. Owing to the absence of adhesion between the tumour and the dura, an *en bloc* removal is generally possible, a piece-meal resection being required for larger lesions. In the surgical strategy, a key point consists of avoiding approaching the lesion through its intraspinal pole in order to reduce the risks of iatrogenic spinal cord compression via surgical instruments. With this aim, the diamond burr drill method is recommended. Generally, the limited extent of arrectomy does not require spinal fusion procedures.
- ▶ Preoperative biopsy could be considered to decide surgical modality if primary malignancy is radiographically suspected.
- ▶ Surgical treatment of symptomatic vertebral OCs allows a favourable outcome in the most cases.

In our case the outcome was favourable. At clinical–radio-logical follow-up the patient is symptoms-free and no signs of recurrence are seen on CT and MRI.

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