CASE REPORT

Unusual Presentation of Bilateral Foraminal Disc Herniation

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A 64-year-old woman was admitted to Soonchunhyang University Seoul Hospital due to the aggravation of bilateral radicular pain for one month prior to her visit. She had a 30 years history of low back pain and intermittent bilateral radiating pain. A magnetic resonance imaging scan revealed a bilateral space-occupying lesion in the L5 foramen. A sagittal computed tomography scan showed a disc space-narrowing, vacuum-containing, and widening of the neural exit foramen with thinning of the pedicle and posterior vertebral body scalloping. An axial scan showed that the space-occupying lesion contained calcification and had eroded the surrounding bony structure. During surgical exploration, the atrophic L5 nerve root was identified over the mass-like lesion, and the lesion was shown to be a result of a hard, extruded disc fragment. A bilateral foraminal disc is a very rare condition that when it progresses chronically and gradually, can erode adjacent bony structures. Specific precautions are necessary during fusion surgery with a pedicle screw.

Keywords: Intervertebral disc; Foramen; Neurilemmoma; Pedicle; Diagnostic errors

INTRODUCTION

Foraminal and/or extraforaminal disc herniation is common in the elderly, and it usually involves a unilateral foramen [1]. Generally, a foraminal disc herniation does not enlarge the neural foramen or the surrounding bony structures, but a neurogenic tumor, such as a neurofibroma or schwannoma, may gradually erode the bony structure because the tumor grows slowly over a long period of time.

We treated an unusual bilateral foraminal disc herniation that was associated with the erosion of surrounding bony structures. In the literature, few cases have been reported in which a herniated disc caused the erosion of the pedicle [2-6], but to our knowledge, there has been no previous report describing bilateral involvement. Initially, it was difficult to differentiate between a bilateral foraminal disc herniation and a neurogenic tumor of the nerve roots. We present the case of a patient with an unusual bilateral foraminal disc that erodes the surrounding bony structures by mimicking a slow-growing neurogenic tumor as well as a review of the pertinent literature.

CASE REPORT

A 64-year-old woman was admitted to Soonchunhyang University Seoul Hospital due to the recent aggravation of bilateral radicular pain in her buttocks, posterior thigh, and posterior calf for a month prior to admission. She had a 30 years history of low back pain and of intermittent bilateral pain radiating to the posterior thigh and leg. A neurological examination demonstrated mild hypoesthesia at the left L4, L5, and S1 dermatomes, while a manual muscle test found motion and resistance to be intact. The straight leg raising test was negative, and lumbar spine radiographs showed a loss of lumbar lordosis, mild degenerative changes at L3-4, L4-5 with severe disc space narrowing, and degenerative changes at the L5-S1 vertebral levels with thinned L5 pedicles. A magnetic resonance imaging (MRI) scan (Fig. 1A-D) revealed a space-occupying lesion in the bilateral L5 foramen. A sagittal image of computed tomography scan (Fig. 2A, B) showed the widening of the bilateral neural foramen with a thinning of the pedicle and scalloping of the posterior vertebral body. An axial scan (Fig. 2C) showed that the space-occupying lesion contained calcifica-

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Fig. 1. Magnetic resonance images show a foraminal obstruction due to a mass-like lesion (arrow). (A) Right parasagittal T2-weighted image shows the space-occupying lesion in the intervertebral foramen compressing the L5 nerve root (arrow). (B) Left parasagittal T2-weighted image shows that low-signal intensity material filled the L5 foramen (arrow). (C) Axial T2-weighted image shows bilateral hypointense foraminal mass-like lesion elevating the L5 nerve roots (arrows). (D) Post-contrast image shows isointensity with peripheral enhancement (arrows).

tion and that the surrounding bony structures had been eroded (i.e., pedicle, posterior vertebral body, transverse process, and articular facet). Coronal reconstruction of MRI scan (Fig. 2D) showed an exophytic lesion, emanating from the intervertebral disc, lined with thin calcification, and growing into the neural fo-

ramen. Our initial diagnosis was of a bilateral foraminal disc herniation, but a neurogenic tumor of the nerve roots could not be excluded due to the unusual radiographic findings. A surgical exploration revealed an atrophy of the L5 nerve root over a mass-like lesion (Fig. 3) that was shown to be an extruded disc fragment with

Fig. 2. (A) Right parasagittal image of CT scan, calcified mass (arrow) positioned in the L5 intervertebral foramen. (B) Left parasagittal image of CT scan, the soft mass-like lesion with calcification eroded the adjacent bony structure (arrows) into a pencil-like, thin pedicle, scalloping the posterior vertebral body with a thin lamina isthmus portion. (C) Axial image of CT scan, round and large calcified mass (dark arrow) on the right side, mass on the left side contained a small calcified mass and air (white arrow). (D) Coronal T1-weighted post-contrast magnetic resonance image. The mother disc was connected to the disc fragment through the intervertebral foramen (arrows). CT, computed tomography.

calcification. The patient underwent a bilateral laminectomy and posterior lumbar interbody fusion where we bilaterally inserted screws at the L4 pedicles but only the right side at the L5 pedicle

because the left side pedicle had been excessively eroded. The patient was ambulatory 2 days after the operation and was discharged uneventfully. At a 3-year follow-up, the patient showed

Fig. 3. Intraoperative finding. Photomicrograph showing the left L5 nerve root (black arrow) retracted by dissector and the hard extruded disc fragment (white arrow) positioned on the ventral side of the nerve root.

complete resolution of the radiating pain to the legs and of the mild, intermittent pain in her lower back.

DISCUSSION

In this case, the radiological features were typical of a bilateral L5 root lesion and strongly suggested the presence of a mass of soft tissue. A parasagittal MRI image revealed a filled mass-like lesion that was composed of a mix of soft tissue and nerve root shadow, indicating that it was a slow-growing benign lesion. However, a post-contrast image showed a peripheral enhancement of the mass, and this observation was a source of confusion. The case showed two atypical findings for classical foraminal disc herniation, so we initially considered it to be a neurogenic tumor for the following reasons.

First, the lesion occurred bilaterally, and we did not see the foraminal/extraforaminal disc on both sides. However, a neurogenic tumor in the spinal nerve root can occur in multiple regions, including bilaterally. Second, the posterior vertebral body and the pedicle were eroded, but the cortex was well preserved. A neurogenic tumor has been suggested to be able to erode a foramen, but the adjacent cortical bone is usually preserved. With a herniated

disc on the other hand, the adjacent cortical bone is resolved [2]. In this case, the erosion of the pedicle and the vertebral body was severe, while the cortex was well preserved. Such findings are not commonly observed in a foraminal disc. In particular, the left L5 pedicle was so severely eroded that it had become pencil-shaped, so we could not insert a pedicle screw. Usually, bony structure erosion is observed in cases where the compression has progressed to adjacent structures slowly and gradually over a long period of time.

When a space-occupying lesion is found around the neural foramen, several conditions can be considered, including the presence of foraminal disc herniation, schwannoma, neurofibroma, metastatic lesions, or synovial cyst [2,7]. Moreover, when the pedicle is eroded, physicians should consider the possibility of a congenital absence of the pedicle, arachnoid cyst, aneurysmal dilatation, a destructive bone tumor, and massive epidural vascular malformation [2]. In such situations, differentiation could be difficult through conventional axial and sagittal MRI. Thus, the coronal and oblique sagittal MRI views may be more useful. In this case, we managed to detect that the mother disc had become connected to the extrusion through the foramen postoperatively.

A foraminal disc should be considered in the differential diagnosis of a space-occupying lesion in the bilateral neural foramen.

In certain cases, it progresses chronically and gradually and erode adjacent bony structures, like a neurogenic tumor can. Such bony structural changes should be considered carefully during preoperative surgical planning.

REFERENCES

1. Broom MJ. Foraminal and extraforaminal lumbar disk herniations. Clin Orthop Relat Res 1993;(289):118-26.
2. Ashkenazi E, Pomeranz S, Floman Y. Foraminal herniation of a lumbar disc mimicking neurinoma on CT and MR imaging. J Spinal Disord 1997;10:448-50.
3. Briceno CE, Fazl M, Willinsky RA, Gertzbein S. Sequestered lumbar intervertebral disc associated with vertebral erosion. Spine (Phila Pa 1976) 1989;14:898-9.
4. Castillo M. Neural foramen remodeling caused by a sequestered disk fragment. AJNR Am J Neuroradiol 1991;12:566.
5. Emamian SA, Skriver EB, Henriksen L, Cortsen ME. Lumbar herniated disk mimicking neurinoma: case report. Acta Radiol 1993;34:127-9.
6. Vadala G, Dore R, Garbagna P. Unusual osseous changes in lumbar herniated disks: CT features. J Comput Assist Tomogr 1985;9:1045-9.
7. Metellus P, Fuentes S, Dufour H, Do L, Figarella-Branger D, Grisoli F. An unusual presentation of a lumbar synovial cyst: case report. Spine (Phila Pa 1976) 2002;27:E278-80.