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Osteoma Arising From the Lumbar Articular Process

—Case Report—

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Abstract

A 57-year-old man presented with an extremely rare osteoma originating from the left L-5 inferior articular process and causing lumbo-crural sciatica. Postmyelography computed tomography and magnetic resonance imaging showed an osteoma compressing the spinal nerve root at the lateral recess. Decompression facetectomy and excision of the lesion followed by transforaminal lumbar interbody fusion between L-5 and S-1 provided complete relief from the symptoms. Histological examination confirmed the diagnosis of benign osteoma. The previous seven cases of spinal osteoma involved the vertebral body, pedicle and posterior elements. Spinal osteomas should be considered in the differential diagnosis of benign lesion originating from the articular process.

Key words: osteoma, lumbar spine, articular process, transforaminal lumbar interbody fusion

Introduction

Osteoma is a slow-growing, protruding tumor consisting of abnormally dense but otherwise normal bone formed in the periosteum.[2] Osteoma almost exclusively occurs in the skull and facial bones but is occasionally found in the long bones and spine.[5,6,11,12] Only seven osteomas affecting the spine have been reported: three located in the cervical vertebrae,[5,6,11,12] two in the lumbar vertebrae,[11] and two in the sacrum.[11] Spinal osteomas have a predilection for the vertebral body[5,6,11] and have been observed in the pedicle[12] and posterior elements.[11] We recently treated a patient with an osteoma arising from the left L-5 inferior articular process.

Case Report

A 57-year-old fireman with a 15-year history of low back pain experienced sudden onset of sciatic pain radiating to the posterolateral aspect of the left leg and foot when he arose from a seat. The pain worsened on sitting for long periods and was unrelieved by rest. He underwent medical examination and non-steroidal analgesics were prescribed. However, the patient did not respond to conservative therapy and was hospitalized after 2 weeks.

Neurological examination revealed straight leg raising limited to 60 degrees. The left Achilles tendon reflex was absent and the left extensor and flexor hallucis longus muscles showed 4/5 strength. In addition, loss of sensation was confirmed in the left S-1 dermatome. Radiography of the lumbar spine indicated left degenerative lumbar scoliosis associated with a well-defined radiodense focus located in the left L-5 inferior articular process (Fig. 1). The central area of the tumor was hypointense on both T_1- and T_2-weighted magnetic resonance (MR) imaging (Fig. 2). Myelography indicated that the left S-1 root sheath was almost obliterated by the local osseous lesion. Postmyelography computed tomography (CT) clearly showed a sessile, homogeneous, radiodense mass with a lobulated margin protruding from the left L-5 inferior articular process. The facing superior articular process of S-1 presented hyperostotic bone reaction that had contributed to lateral recess stenosis (Fig. 3). Three-dimensional CT demonstrat-

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Fig. 1 **Posteroanterior radiograph of the lumbar spine showing left degenerative lumbar scoliosis associated with a well-defined, radiodense focus located in the left L-5 inferior articular process (*arrow*).**

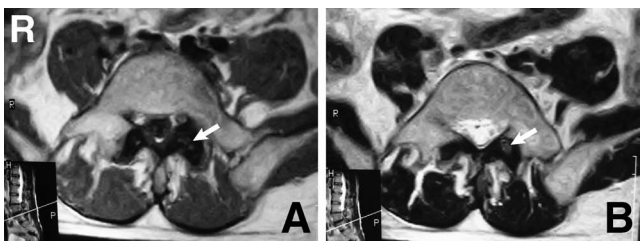

Fig. 2 **Axial T_1- (A) and T_2-weighted (B) magnetic resonance images showing the central area of the tumor with hypointense changes (*arrow*).**

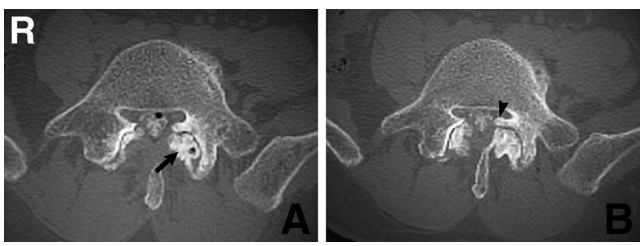

Fig. 3 **Axial postmyelography computed tomography scans showing a sessile, homogeneous, radiodense mass (*arrow*) with a lobulated margin protruding from the left L-5 inferior articular process (A), and the facing superior articular process of S-1 with hyperostotic bone reaction (*arrowhead*) that has contributed to lateral recess stenosis (B).**

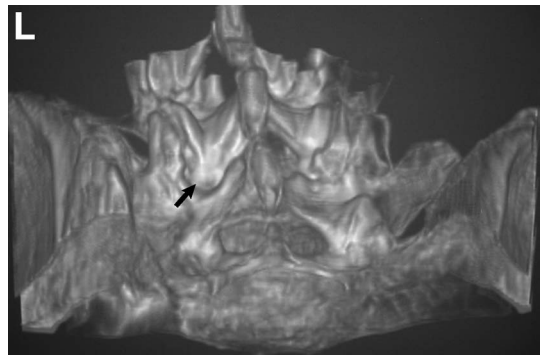

Fig. 4 **Three-dimensional computed tomography scan showing a L-5 inferior articular process appearing hypertrophic compared with the contralateral unaffected side (*arrow*).**

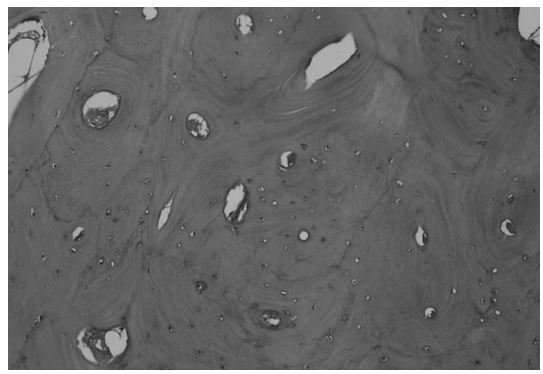

Fig. 5 **Photomicrograph of the surgical specimen showing uniformly dense, compact, cortex-like, mature lamellar bone forming an irregular pattern, indicating osteoma. Hematoxylin-eosin stain, original magnification ×100.**

ed that the unilateral L-5 inferior articular process was hypertrophic compared with the contralateral unaffected side (Fig. 4). Selective S-1 nerve root block with lidocaine was performed together with steroid administration, which relieved the symptoms immediately, but the pain recurred with the same intensity within a day. These findings led us to a diagnosis of osteoma or osteochondroma arising from the lumbar articular process, for which surgical treatment was advised.

At surgery, a rock-hard, cortex-like bone was found abutting the thecal sac and compressing the S-1 nerve root at the lateral recess. After left L5-S complete facetectomy to remove the mass lesion and lateral recess stenosis, unilateral transforaminal lumbar interbody fusion between L-5 and S-1 was

performed using the pedicle screw system.

Histological examination of the mass lesion found uniformly dense, compact, cortex-like, mature lamellar bone in an irregular pattern. There was no evidence of cartilaginous cap or central nidus. These features were consistent with the diagnosis of benign osteoma (Fig. 5).

The clinical course following surgery was uneventful and the patient promptly became symptom-free. Follow-up CT obtained 6 months postoperatively confirmed the left facetectomy and complete excision of the lesion without recurrence (Fig. 6). The patient returned to work as a fireman without restrictions and has been asymptomatic for 1 year.

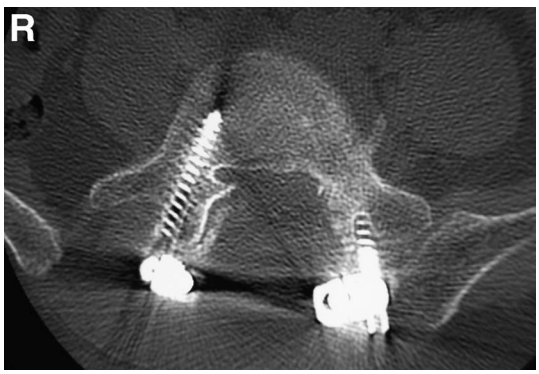

Fig. 6 Follow-up computed tomography scan obtained 6 months postoperatively showing the left facetectomy and complete excision of the lesion without recurrence.

Discussion

Spinal osteoma is extremely rare with only seven previous cases (Table 1).[5,6,11,12] The five female and three male patients were aged from 34 to 68 years (mean 53 years) at presentation. All patients had a history of local pain, and six of the eight presented with neurological symptoms. Lumbosacral spine appears to be the most common site, whereas the thoracic spine has never been involved.

The differential diagnosis for bony tumor expanding into the spinal canal includes osteochondroma, which also occurs infrequently.[1,4,7,10,13,14] However, histological examination can usually exclude osteochondroma on the basis of its cartilaginous cap. Although MR imaging of osteoma typically shows complete and uniform absence of signals due to the dense calcification, preoperative T_2-weighted MR imaging of our case did not exhibit such extremely hypointense changes. This confusing fact initially obscured the differential diagnosis in the present case. We suggest that the unusual MR imaging appearance reflected the presence of spongy cancellous tissue, which is a feature of medullary (cancellous) osteoma.[2,11,12]

Subtotal resection of two cases of spinal osteoma yielded unsatisfactory results, suggesting that total resection of the lesion should be attempted to achieve complete relief from pain.[11] We believe that

Table 1 Reported cases of spinal osteomas

Author (Year)	Age (yrs)/ Sex	Location	Symptoms	Treatment	Results
Laus et al. (1993),[5] (1996)[6]	53/M	C2–3 body	neck pain and dysphagia	total resection (PEA)	NED facial nerve palsy
Peyser et al. (1996)[11]	44/F	L-4 body	low back pain and sciatica	total resection (L4–5 PLIF)	NED
	64/F	C4–6 body	neck pain and paresthesia	subtotal resection (C2–6 PF)	persistent neck pain
	68/F	ala of sacrum	low back pain and sciatica	total resection (L4–S1 PLF)	persistent back pain, non-union
	43/F	S-2 body	low back pain	subtotal resection	persistent back pain
	63/F	L-5 body	low back pain and sciatica	total resection (L4–S1 ALIF)	NED
Rengachary and Sanan (1998)[12]	34/M	C-6 pedicle	neck pain and radiculopathy	total resection (hemilaminectomy)	NED
Present case	57/M	L-5 articular process	low back pain and sciatica	total resection (L5–S1 TLIF)	NED

ALIF: anterior lumbar interbody fusion, NED: no evidence of disease, PEA: prevascular extraoral approach, PF: posterior spinal fusion, PLF: posterolateral lumbar fusion, PLIF: posterior lumbar interbody fusion, TLIF: transforaminal lumbar interbody fusion.

the emergence of a previously clinically silent lesion in the aged may be related to the overlapping of spondylotic changes caused by minor trauma. A lumbar articular process neoplasm (such as the current case) might be effectively removed via a unilateral approach with spinal fusion by transforaminal lumbar interbody fusion. The procedure provides bilateral anterior and posterior column support through a unilateral posterolateral approach, and less traction of the thecal sac and exiting nerve root than the conventional posterior lumbar interbody fusion.[3,8,9] Recurrence does not seem to be a problem and five of the eight reported patients enjoyed pain relief.

This present case of sciatic pain secondary to an osteoma arising from the lumbar articular process shows that spinal osteomas, although extremely uncommon, should be considered in the differential diagnosis of benign lesion originating from the articular process.

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