

## Case Report

# Lumbar Osteochondroma Arising from Spondylolytic L3 Lamina

Byung Kwan Choi, M.D., In Ho Han, M.D., Won Ho Cho, M.D., Seung Heon Cha, M.D.

Department of Neurosurgery & Medical Research Institute, Pusan National University Hospital, Pusan National University School of Medicine, Busan, Korea

Osteochondromas are common, benign tumors in the long bones, but osteochondromas are rare in the vertebrae. Most vertebral osteochondromas arise from the cervical or upper thoracic spine. However, lumbar osteochondromas have rarely been reported. In this report, a rare case of a lumbar osteochondroma arising from the spondylolytic L3 lamina in a 57-year-old woman is presented. She also had a ruptured disc and lumbar canal stenosis at L4-S1. The osteochondroma was completely removed and a posterior lumbar interbody fusion and instrumentation were performed. Considering the rarity of osteochondromas in the lumbar vertebrae, especially the L3 vertebra, it is possible that the pre-existing lumbar spondylolysis or spondylolisthesis was one of the factors affecting the occurrence or progression of the osteochondroma.

**KEY WORDS :** Lumbar osteochondroma · Spondylolysis.

## INTRODUCTION

Osteochondromas are common, benign bone tumors that usually occur in the long bones, but osteochondromas are rarely found in the vertebrae. Only 1.3-4.1% of osteochondromas involve the vertebral column, and the majority of spinal osteochondromas arise in the cervical and upper thoracic spine<sup>1,2</sup>. A solitary lumbar osteochondroma, especially a symptomatic lesion, is very rare<sup>3-5,7,10</sup>.

We report a very rare case of a lumbar osteochondroma which arose from a spondylolytic L3 lamina and caused lumbar canal stenosis in a 57-year-old woman.

## CASE REPORT

### History and Examination

A 57-year-old woman presented with a complaint of lumbago, right leg pain, and weakness which had worsened over

the preceding 2 months. She also had neurogenic intermittent claudication for 10 years.

On physical examination, she showed normal vital signs and no skeletal abnormalities, including the lumbar surface. The neurologic examination revealed hypesthesia in the right L5 and S1 dermatomes and motor weakness involving the right ankle and great toe (grade IV). She had no family history of inherited diseases.

The plain lateral radiographs revealed isthmic spondylolisthesis of L3 on L4 (grade I) and narrowing of the disc space at L5-S1 (Fig. 1). Magnetic resonance imaging (MRI) showed a mass arising from the lamina of L3 compressing the thecal sac (Fig. 2). In addition, mild spinal canal stenosis with a migrated disc at L4-5 and foraminal stenosis and spondylolysis at L5-S1 were noted on MRI. Computed tomography (CT) revealed an exophytic bony mass originating from the L3 lamina with spondylolysis (Fig. 3).

### Operation

We resected the mass en bloc through a total laminectomy and facetectomy. The diameter of the mass was 1.5 cm and the inner surface was covered with cartilage, and was thus white and smooth. There were no adhesions between the mass and the dura. An osteochondroma occupied the posterior epidural space instead of fibrotic tissues, which

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• Address for reprints : In Ho Han, M.D.  
Department of Neurosurgery & Medical Research Institute, Pusan National University Hospital, Pusan National University School of Medicine, 305 Gudeok-ro, Seo-gu, Busan 602-739, Korea  
Tel : +82-51-240-7257, Fax : +82-51-244-0282  
E-mail : farlateral@hanmail.net



Fig. 1. Plain lateral radiograph shows isthmus spondylolisthesis of L3 on L4 and severe narrowing of the disc space at L5-S1.

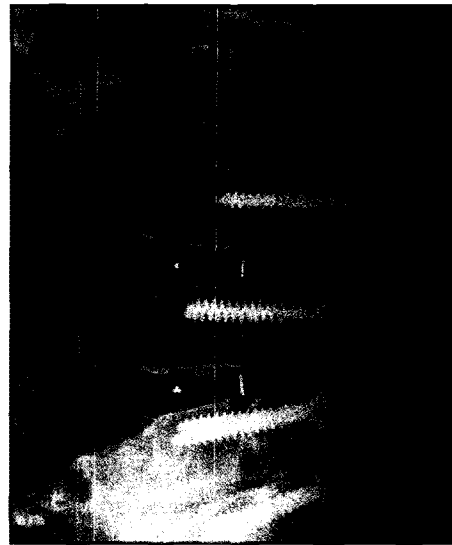


Fig. 4. Post-operative plain lateral radiograph shows decompressive laminectomy, interbody fusion, and pedicle screw instrumentation at L3-4-5-S1.



Fig. 2. T2-weighted sagittal magnetic resonance image shows an exophytic mass which arose from the lamina and compressed the thecal sac at L3 and disc herniation and lumbar canal stenosis at L4-5-S1.

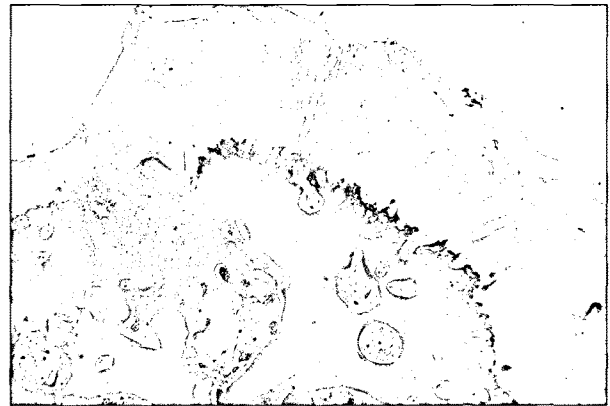


Fig. 5. Histopathologic examination shows a typical finding of osteochondroma with the fibrocartilagenous cap and underlying bone.

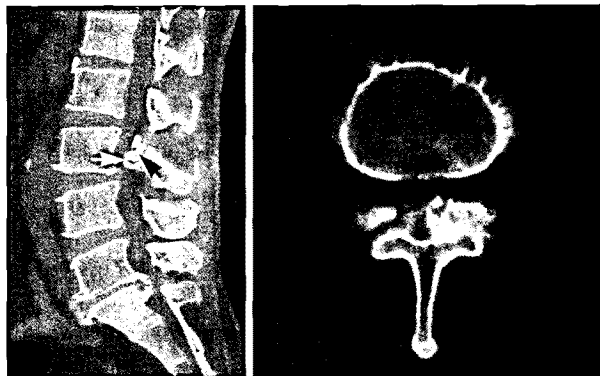


Fig. 3. Sagittal and axial computed tomography shows an exophytic bony mass (white arrow) which arose from the lamina and spondylolytic defect (black arrow) at L3 and hard disc formation at L5-S1.

are usually found in spondylolysis. In addition, a posterior lumbar interbody fusion (PLIF) and pedicle screw instrumentation were performed due to instability at L3-4. At L4-5-S1, additional fusion and pedicle screw instrumentation were performed due to severe foraminal stenosis and central disc herniation with migration (Fig. 4). The histopathologic examination confirmed the lesion to be an osteochondroma (Fig. 5).

### Postoperative course

Postoperatively, the patient's weakness was improved to grade IV+/V and the right leg radiating pain was completely resolved. The neurogenic claudication was also resolved.

### DISCUSSION

An osteochondroma or osteocartilagenous exostosis is one of the most common primary bone tumors. Osteochondro-

mas can occur as a solitary lesion or as multiple lesions, referred to as “multiple exostoses”. Spinal involvement of osteochondromas is rare and most occur in the cervical and upper thoracic vertebrae. Lumbar osteochondromas are very rare, accounting for only 3-4% of spinal osteochondromas<sup>2,6</sup>. In spite of the rarity of symptomatic lumbar osteochondromas, most present with radiating leg pain due to nerve root compression<sup>2,4,6,10</sup>. Fiechtl et al.<sup>3</sup> reported a rare case of a lumbar osteochondroma presenting as an atypical spinal curvature; however, a lumbar osteochondroma presenting with neurogenic claudication due to severe lumbar canal stenosis has been not reported. The main complaint of the patient was right leg radiating pain, which was thought to be due to a ruptured disc and foraminal stenosis at L4-5-S1. However, for the past 10 years, she had neurogenic claudication, which is a main symptom of lumbar canal stenosis. We surmise that the neurogenic claudication was due to a pre-existing lumbar osteochondroma. The average age at presentation of osteochondromas is approximately 30 years, with a male predominance (2.5 : 1)<sup>2,6</sup>. As in our case, an osteochondroma presenting in the 6th decade of life is also rare<sup>9</sup>. Until now, the oldest case of an osteochondroma reported in the literature occurred in a 73-year-old female<sup>6</sup>.

Although osteochondromas can arise from all parts of the spinal column, the most common locations are the posterior elements, including the facets or the laminae near the facets<sup>6,9</sup>. Gaetani et al.<sup>5</sup> reported 11 of 17 lumbar osteochondromas arose from laminae. This high occurrence of osteochondromas in posterior elements may be due to secondary ossification centers located in the neural arch (spinous processes, transverse processes, articular processes, and endplates of vertebral bodies)<sup>4</sup>. The aberrant cartilage tissue in these second ossification centers can cause osteochondromas. Congenital defects or microtrauma is considered to be other factors influencing the occurrence of osteochondromas<sup>4</sup>. In our case, the osteochondroma arose from a spondylolytic lamina. Although osteochondromas commonly arise from laminae, a case of an osteochondroma arising from a spondylolytic lamina, as in our case, has not been reported. The co-existence of osteochondromas in L3 vertebrae with spondylolysis may occur; however, pre-existing spondylolysis might cause the occurrence of an osteochondroma. We speculate that the fibrous cartilage of spondylolysis served as the origin of aberrant cartilaginous tissue, thus forming an osteochondroma. Another possibility is that the instability due to the pre-existing isthmic

spondylolisthesis caused microtrauma to the epiphyseal cartilage, leading to progressive development of the osteochondroma. Indeed, this notion would be in keeping with the high occurrence of osteochondromas in the cervical spine and articular processes characterized by high mobility.

The treatment of choice for osteochondromas is surgical resection. Because most osteochondromas show focal exophytic growth in the posterior elements, such as laminae or articular processes, total resection of the mass and neural decompression can be achieved without fusion surgery<sup>4,6-8,10</sup>. In our case, additional posterior lumbar interbody fusion and instrumentation were inevitable due to the isthmic spondylolisthesis.

## CONCLUSION

We report an unusual case of lumbar osteochondroma which arose from a spondylolytic L3 lamina in a 57-year-old female. Considering the rarity of osteochondromas in the lumbar spine, we speculate that pre-existing lumbar spondylolysis and spondylolisthesis may be causative factors affecting the occurrence or progression of osteochondromas.

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