

Multiple Loose Bodies in the Lumbar Facet Joint: Case Report

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We describe here a patient diagnosed with multiple loose bodies in the lumbar facet joint. The patient was a 52-year-old woman who presented with left sciatic pain. Neurological findings indicated L5 radiculopathy. Radiological findings revealed lateral recess stenosis at the L4–L5 level, and loose bodies in the left L4–L5 facet joint were noted that compressed the left L5 nerve root. We performed laminotomy at the left L4–L5 level, and removed five loose bodies located on the dorsal side of the ligamentum flavum. Following removal of the loose bodies and flavectomy, the L5 nerve root was decompressed. Postoperatively, the patient's symptoms improved markedly. Symptomatic multiple loose bodies in the lumbar facet joint are very rare, and can cause lumbar radiculopathy. It is important for spine surgeons to recognize this pathology.

Keywords: lumbar spinal canal stenosis, loose body, facet joint

Introduction

Intra-articular loose bodies occur frequently in the knee joint or elbow joint; however, they are very rarely found in spinal lesions. Four cases of osseous loose bodies in the spine have been published thus far.^{1–4} Shin et al.¹ and Hongo et al.² reported cases of a loose body occurring in the cervical region. Tambe et al.³ was the first to describe a case of a loose body in the lumbar spinal lesion, termed a “spinolith”. Recently, Takeshima et al.⁴ reported multiple osseous loose bodies associated with lumbar isthmic spondylolisthesis. Here, we present a very rare case of lumbar radiculopathy caused by multiple loose bodies that occurred in the lumbar facet joint without isthmic or degenerative spondylolisthesis.

Case Report

A 52-year-old woman presented with left leg pain after strenuous exercise. She was an athletic trainer by occupation. The symptoms worsened when she exercised again after a month. She visited a local doctor, who identified lumbar disc herniation at L4–L5. Although she was treated conservatively for 6 months, the symptoms did not improve. She was

then referred to our department for further treatment. Physical examination revealed limited straight-leg-raising on the left side at 70°, while the femoral nerve stretch test was negative. There was moderate muscle weakness of the left extensor hallucis longus (EHL) graded as 4/5. Sensory examination showed slight hypoesthesia along the left L5 dermatome. Deep tendon reflexes such as patellar tendon reflex and Achilles tendon reflex were normal, and we did not observe any pathological reflexes. On radiological examination, pre-operative plain radiographs showed almost normal findings except for slight scoliosis due to pain. Magnetic resonance imaging (MRI) of the lumbar spine showed severe unilateral recess stenosis at the left L4–L5 level (Figs. 1A–1C). There was no evidence of disc protrusion. Computed tomography (CT) images after myelography using contrast media showed some loose bodies present within the left L4–L5 facet joint, which compressed the left L5 nerve root (Figs. 2A–2C). Based on these clinical and radiological findings, left L5 nerve root impingement due to multiple loose bodies in the L4–L5 facet joint was diagnosed.

First, partial laminotomy at left L4–L5 level was performed under general anesthesia. Following the laminotomy, multiple loose bodies were identified behind the ligamentum flavum. There were five loose bodies, which had not perforated the ligamentum flavum; thus, removal of the loose bodies and resection of the ligamentum flavum were successfully performed. Then, the decompressed nerve root and dura mater were inspected. We did not observe adhesion of the L5 nerve root or dura mater to the surrounding tissue. Loose bodies were white and yellow, smooth in their surface and <10 mm in diameter, respectively (Fig. 3A). Pathological examination of the removed tissue stained by hematoxylin and eosin showed trabecular bone surrounding the peripheral cartilage tissue and no malignant findings (Fig. 3B). Postoperative CT images and MRI of the lumbar spine showed complete removal of the loose bodies and decompression of the lateral recess stenosis. Following surgery, the patient experienced relief from the left leg pain, and muscle weakness of the left EHL and hypoesthesia improved; the postoperative course was uneventful.

Discussion

Milgram classified 119 cases of loose bodies in human joints into three groups based on the histopathological characteristics of the nidus of the loose bodies⁵: (1) secondary to osteochondral fracture with articular cartilage with or without attached bone, (2) secondary to synovial osteochondromatosis mainly with lobular cartilage, and (3) secondary to joint

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Fig. 1 Preoperative MRI of the lumbar spine showed lateral recess stenosis of the left L4–L5 facet joint. (A) Sagittal view (T₁-weighted image), (B) sagittal view (T₂-weighted image), (C) axial view through the L4–L5 level (T₂-weighted image).

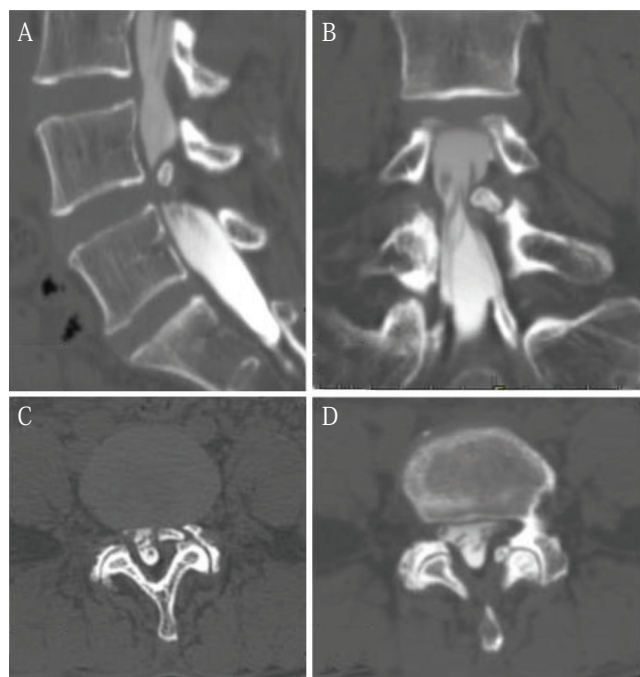


Fig. 2 Preoperative reconstructed CT-myelography images show some loose bodies in the left L4–L5 facet joint, compressing the left L5 nerve root. (A) Sagittal slice, (B) coronal slice, (C) axial slice (through the L4–L5 disc level), (D) axial slice (through the L5 vertebral level).

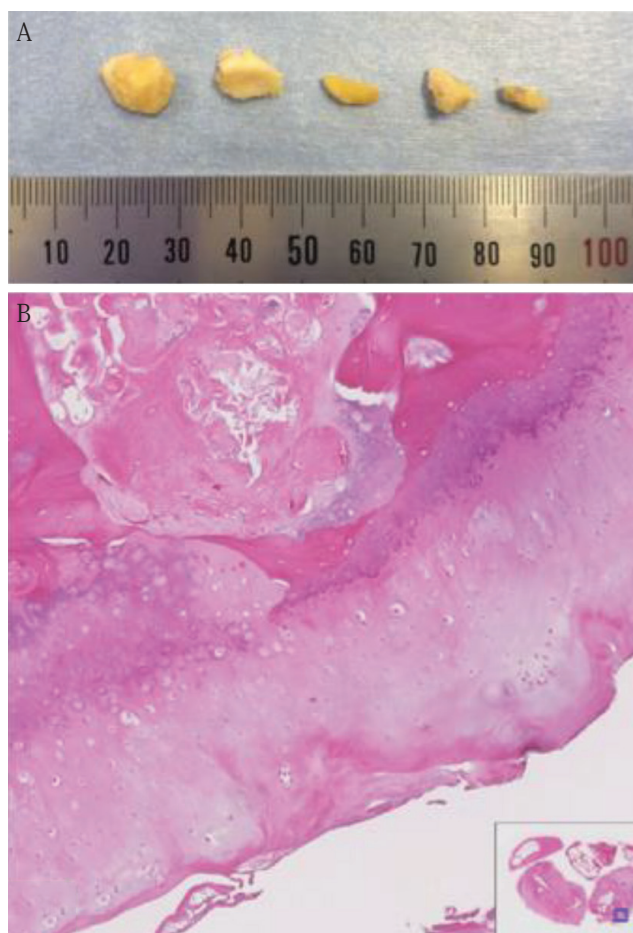


Fig. 3 Excised specimens and their histopathology: (A) We removed five loose bodies measuring <10 mm each. (B) Histopathological examination of the removed tissue stained by hematoxylin and eosin showed trabecular bone surrounding the peripheral cartilage tissue and no malignant findings.

surface disintegration including degenerative arthritis and avascular necrosis showing various types of tissue but no lobular cartilage. A few cases of synovial osteochondromatosis causing lumbar radiculopathy have been reported.^{6,7)} However, in our case, the postoperative histological analysis indicated that the loose bodies had trabecular bone surrounding the peripheral cartilage tissue and no malignant tissue, suggesting that the loose bodies originated from an osteochondral fracture or joint surface disintegration.

In the case reported by Tambe et al., the origin of the loose body was uncertain. However, they suggested that it had been present for some years and was originally located in an innocuous locus and later migrated to the spinal canal where it led to the patient's symptoms.³⁾ In our case, the patient also experienced sudden onset of pain after a long asymptomatic period, which supports the mechanism suggested by Tambe et al.

In the clinical setting, we have to differentiate this entity from other entities which cause lumbar radiculopathy such as lumbar cystic lesions, ossification of the lumbar ligament and neoplastic lesions as well as degenerative spinal canal stenosis. Preoperative radiological diagnosis of loose bodies in

the lumbar facet joint is sometimes difficult to be differentiated from juxta facet cyst such as synovial cyst or ganglion cyst in MRI findings alone. Neto et al.⁸⁾ reported that MRI findings of internal content of synovial cysts are typically hypo- to iso-intense on T₁-weighted images (WI) and homogeneously hyperintense on T₂; however, it depends on the contents in the cyst, internal T₂-hypointense debris and even osseous loose bodies is not rare. On the other hand, CT findings alone in our case need to be differentiated from lumbar ossified lesions such as ossification of ligamentum flavum (OLF) and ossification of posterior longitudinal ligament (OPLL). Kawaguchi et al.⁹⁾ reported that patients with spinal stenosis due to lumbar ossified lesions had frequently coexisting ossified lesions in the cervical and/or thoracic spinal canal, which suggests that ossified lesions in multiple-spinal levels may be considered OLF or OPLL. Recent multi-planar reconstructed CT images also help us to find the detailed distribution of the ossified lesions. About differentiation from neoplastic lesions, Kuraishi et al.¹⁰⁾ reported the cases of osteochondroma caused lumbar radiculopathy, which have cortical and medullary continuity between the tumor and the vertebra in CT images. Although malignant spinal tumor such as primary spinal sarcoma is rare, we should pay attention to consider them when there are osteolytic or osteoblastic change in CT images and extradural mass extending from spine in MRI.¹¹⁾ While there are various differential diagnoses as described above, it is very important for us to be diagnosed comprehensively using radiological findings of both MRI and multi-planar reconstructed CT images when we differentiate this entity from not only degenerative lumbar spinal canal stenosis but also other entities. The characteristic findings of this entity are severe asymmetric lateral recess stenosis in T₂-weighted MRI and well-defined ossified lesion in the medial facet joint in CT images.

The treatment plan for loose bodies in the spine is based on that for lumbar spinal canal stenosis. If conservative treatment is not effective, surgical treatment should to be

considered. The removal of the loose bodies and decompression of the affected nerve root is necessary to achieve symptomatic relief. In this case, the loose bodies had not penetrated the ligamentum flavum and were located in the lumbar facet joint on the dorsal side of the ligamentum flavum.

Symptomatic multiple loose bodies in the facet joint are very rare, and can cause lumbar radiculopathy. Spine surgeons should be aware of this pathology.

Conflicts of Interest Disclosure

The authors have no conflicts of interest concerning the materials or methods used in this study or the findings specified in this paper.

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