[Case Report]

Foraminal encroachment caused by recurrent bilateral intraforaminal lumbar disc herniation after posterior discectomy

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SUMMARY

Recurrent lumbar disc herniation has been reported in 4 to 12% of patients after disc excision. However, recurrence of bilateral intraforaminal disc herniation associated with foraminal encroachment has not been reported.

This report describes the case of a 42-year-old man who underwent a posterior discectomy for L5-S1 disc herniation. After a pain free period, bilateral leg pain appeared. Magnetic resonance imaging (MRI) and computer tomography (CT) revealed recurrent foraminal lumbar disc herniation. Disc space narrowing occurring after discectomy and coexisting foraminal stenosis and instability may have caused annular bulging. This patient has undergone anterior discectomy and interbody fusion, and the clinical symptom were relieved after 2nd surgery. The anterior interbody fusion was useful therapy for such re-operated patients showing severe low back pain caused by intervertebral instability, and severe leg pain caused by foraminal stenosis.

Key words: Lumbar disc herniation, foraminal encroachment, recurrence

I. Introduction

Recurrent lumbar disc herniation has been reported in 4 to 12% of patients after disc excision[1-7]. However, to the best of our knowledge, there has been only one recurrence of contralateral foraminal lumbar disc herniation reported[6], and no reports of bilateral foraminal or recurrent foraminal disc herniation. Despite lateral lumbar spinal canal is an important location for the pathogenesis of ganglionitis to cause sciatic pain, there still remains the difficulty of diagnosis that may cause failed back surgeries. Here we report the cause of recurrence that characterized bilateral foraminal encroachment and the surgical methods are discussed.
II. Case

In September 2001, a 42-year-old man recognized pain in his left lower extremity. He underwent a medical examination at another institution. Magnetic resonance imaging (MRI) showed L5-S1 lumbar disc herniation (Fig. 1a). Since he did not respond to conservative treatment, he underwent a posterior discectomy in January 2002. The extruded L5-S1 disc material was excised from his left side and the removed disc material weighed about one gram. He gained pain relief right after the initial operation.

Six months after the initial operation, sudden onset of low back pain and progressive right leg pain occurred without incidence. The patient was unable to bear weight on his right lower extremity, and the leg pain also appeared on the left side. After he failed to respond to conservative management, he was referred to our clinic.

On neurological examination, bilateral L5 radiculopathy was identified. The patient showed markedly restricted straight leg raising on both sides at twenty degrees and hypesthesia at the lateral aspect of the lower legs. There was weakness of the extensor hallucis longus muscles and ankle dorsiflexors on his right side. Roentgenograms showed bone spurs and instability at L5-S1 lumbar spine. MRI showed disc degeneration and narrowing of the L5-S1 disc (Fig. 1b, c, and d), and encroachment of the right L5 root canal was noted (Fig. 2). Myelography showed slight anterior indentation at L3-4 and 4-5 levels. However, neither spinal canal stenosis nor root shortening was observed (Fig. 3). Discography confirmed bilateral intraforaminal lumbar disc herniation at the

![Fig. 1](image1) Magnetic Resonance Imaging (MRI) of the a, b preoperative, c postoperative, and d final preoperative lumbar spine. a, b Preoperative T2-weighted MRI from the first operation showing extruded L5-S1 herniation. Comparison between b, c and d shows disc height loss and its bulge.

![Fig. 2](image2) Right L5 root canal became smaller in size. a before the first operation, b before the second operation.

![Fig. 3](image3) Myelography showed slight stenosis at 4/5 level (arrows). However, neither spinal canal stenosis nor root shortening was observed.
Recurrent bilateral intraforaminal lumbar disc herniation

L5-S1 disc and CT after discography revealed narrowing of the intervertebral foramen with a bulged disc and bone spurs (Fig. 4). Selective nerve root infiltration using 1% lidocaine followed by radiculography of the L5 root indicated that contrast medium was interrupted at the intervertebral foramen. The patient gained pain relief immediately after the procedure for a short time.

Expecting an improvement in disc height, transperitoneal anterior interbody fusion was performed in April 2003. There was not much nucleus left and degenerative tissues were encountered. Autogenous bone grafts from the iliac crest were inserted into the intervertebral space.

After two weeks of bed rest, walking was allowed with a hard corset. The patient's symptoms were significantly relieved after surgery without any complications, and he does not have any clinical symptoms in June 2005.

III. Discussion

Reoperation rate for recurrent lumbar disc herniation has been reported to be 4-15% [1-7]. The causes were: true recurrence of lumbar disc herniation at the same level, new disc prolapses at a different disc, epidural fibrosis, local arachnoiditis, secondary spinal stenosis, instability, symptomatic arthritis of the small intervertebral joints (facet syndrome), spondylitis or spondylodiscitis [1-7].

In other reports, the rate of occurrence of lateral lumbar disc herniation was 0.2-11.7% [4,8,10]. The point of interest in the present case is whether intraforaminal herniations were missed at the first operation. Comparison of the first and the second MRI virtually rules out this possibility. Furthermore, S1 root block was effective before the first surgery and the patient became symptom free for a six-month period after the surgery. The possible pathologies of the present case are:

1. During the primary discectomy the external annulus had been damaged on the side opposite to that which underwent surgery, and disc material not removed during the primary discectomy may have subsequently extruded through the weakened annulus and caused contralateral herniation [4].

2. The healing processes that occurred in the outer lamellae after the annular injury may have led to a less effective reconstitution of the external annulus or there was a small, asymptomatic herniation or bulge present at the time of the first operation, which later grew in size.

3. Disc-space-narrowing may have occurred after the discectomy or may have been caused by degenerative disc disease as well as being the result of various surgical procedures. Moreover, the procedure may have induced instability at the operated spinal segment and a weakened disc may have undergone lateral herniation.
However, the presence of instability, bony compression and disc-height-narrowing, which might be caused by the discectomy, may have played a role in this case. Foraminal encroachment is caused by disc height narrowing, and followed facet joint capsule relaxation and hypertrophy of the furavum. Disc bulge and caudal displacement of the pedicle characterize front-back stenosis and up-down stenosis. The pain free interval after the primary discectomy was important in the diagnosis of a recurrent herniation. However, when recurrence of an external lumbar disc herniation occurs, the clinical picture is sometimes indistinguishable from typical posterolateral herniation. The present case, both L5 roots were under the pressure of disc bulging and bone spur, and sidling along in the root canal. This up-down stenosis made roots unmovable within the root canal and dynamic factor emphasized it. It has been reported that clinical results after anterior discectomy and interbody fusion were better than that after posterior discectomy for the patients showing recurrence of disc herniation, because of adhesion of nerve roots and severe low back pain caused by intervertebral instability[9]. In the current case, we selected anterior interbody fusion for stabilization and spread foraminal stenosis.

Thus, preoperative differentiation of such causes leading to recurrence of symptomatology is important, not only for surgical planning, but also for predicting the need for multiple back operations.

要 旨

Love法施行後における腰椎椎間板ヘルニアの再発率は4-12%と報告されている。しかしながら、両側椎間孔内への椎間板ヘルニアの再発に関する報告はない。今回我々はL5S椎間板ヘルニアに対してLove法施行後、経過中に両下肢痛の再発を来たした症例を経験したので報告する。症例は42歳男性で、MR1およびCTにて両側椎間孔への椎間板の膨隆と骨髄の形成を認め、術核摘出術後の椎間高の狭小化と椎間孔狭窄、および腰椎の不安定性がヘルニアの再発に関与していると考えられた。本症例においては自家骨による前方固定術を施行し、良好な成績を示した。再手術例後、椎間不安定性のため腰痛が強いため椎間孔狭窄が症状の原因となっている神経根性下肢痛の再発する場合は前方固定術のよい適応である。

References