



**INTERNATIONAL JOURNAL OF
PHARMACEUTICAL SCIENCES**
[ISSN: 0975-4725; CODEN(USA): IJPS00]
Journal Homepage: <https://www.ijpsjournal.com>



Case Study

Intervertebral Disc Prolapse (IVDP) L5-S1 with Calcified Disc: A Case Report

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ARTICLE INFO

Published: 07 Aug 2026

Keywords:

Intervertebral disc prolapse;
Lumbar disc herniation;
Calcified disc herniation;
L5-S1; Spinal stenosis;
Radiculopathy;
Laminectomy; Discectomy.

DOI:

10.5281/zenodo.21839730

ABSTRACT

Intervertebral disc prolapse (IVDP) at L5-S1 level is an unusual presentation of low back pain and lumbosacral radiculopathy; however, calcified lumbar disc herniation with spinal stenosis associated with bilateral sacroiliitis is a rare and complex clinical picture. We present a challenging case of a patient with multiple comorbidities who was referred for surgery because of failed conservative treatment of S1 radiculopathy due to calcified disc herniation at the L5-S1 level. The case highlights the importance of thorough clinical and radiological workup, as well as the need for surgical decompression in carefully selected patients. A 63-year-old man came in with a complaint of chronic low back pain that radiated to both lower limbs. The patient had signs and symptoms of S1 radiculopathy. He was diagnosed with diabetes mellitus, dyslipidemia, and hypothyroidism. During the examination, the patient stated that he was suffering from continuous pain and limited movement. MRI of the spine showed grade I listhesis of L5 over S1. There was a calcified hernia in the patient's L5-S1 disc. The hernia was big enough to narrow the spinal canal and press the S1 nerve root. In addition, there was a diffuse disc bulge with central disc protrusion observed. Other than hernia, the patient had bilateral sacroiliitis. After a laminectomy and discectomy of L5-S1 and bilateral sacroiliac joint injection of the patient's SI joints, he was placed under anesthesia. After the surgery, the patient received therapy and treatment.

INTRODUCTION

Definition

Intervertebral disc prolapse (IVDP) is a condition where the nucleus pulposus protrudes from the annulus fibrosus, therefore, causing compression of nearby nerves.¹ IVDP is more prevalent in the lumbar region due to the increased mechanical

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Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.



stress exerted on the L4-L5 and L5-S1 intervertebral discs.² Calcified lumbar disc prolapse describes a rare condition characterized by calcium deposits in the herniated disc, making it stiff.³

Epidemiology

About 1-3% of people develop lumbar disc herniation, which is a serious condition since it causes low back pain and Sciatica.⁴ This problem predominantly affects men and people aged between thirty and fifty years.⁵ Meanwhile, calcified lumbar disc herniation is uncommon among adults, with few reports and case studies.³

Etiology

The main risk factors for IVDP include old age, obesity, genetic predisposition, trauma, poor posture, and strenuous activities.⁶ Degenerative conditions, such as disc dehydration, weaken the annulus fibrous, leading to herniation.⁶ In addition, dystrophic calcification of the herniated disc also causes calcified lumbar disc prolapsed.³

Pathophysiology

Disc herniation happens when the annulus fibrosus is worn out or injured, thereby letting the gel-like substance protrude out of the spine.⁶ The condition leads to reduced motion in the spine, compression of the spinal cord and/or nerve roots, and an inflammatory response that causes pain and discomfort.⁸ Moreover, calcification of the herniated disc narrows the spinal canal, aggravating nerve compression and reducing the ability of the condition to heal naturally.³

Clinical Presentation

Sciatica is the most common manifestation of a herniated disc in the lumbar region.¹ It presents as an intense pain that originates from the lower back

and travels down to the legs, often described as a burning, sharp sensation.¹ Numbness, tingling, weakness, and limited movement in the lower back and legs also accompany Sciatica.² In addition, severe cases of lumbar disc herniation can result in Cauda Equina Syndrome and should be subjected to immediate surgery.⁹

Diagnosis

A comprehensive physical examination, together with patient history, is the primary step towards diagnosing lumbar disc herniation.¹ In addition, MRI scans are the most reliable imaging technique used in diagnosis.² Meanwhile, CT Scans are more appropriate for detecting calcified lumbar disc herniation.¹⁰

Treatment

The mainstay of treatment for lumbar disc herniation includes analgesics and non-steroidal anti-inflammatory drugs.² However, in cases where the patient experiences recurring pain and discomfort, surgery is recommended.⁹ In conclusion, Microdiscectomy is the standard operative procedure for treating lumbar disc herniation that does not respond to conservative management.⁵

CASE PRESENTATION

History and Clinical examination

A 69-year-old male presented to the Department of Orthopaedics with complaints of low back ache radiating to both lower limbs, associated with features suggestive of bilateral S1 radiculopathy. The patient had a known history of Type 2 diabetes mellitus, managed with a combination of vildagliptin and metformin, dyslipidemia on regular medication, and hypothyroidism treated with levothyroxine. Based on the clinical presentation, a lumbosacral spinal pathology was



suspected, and subsequent radiological evaluation confirmed L5–S1 intervertebral disc prolapse with a calcified disc.

Consultation

The patient was evaluated by the Department of Orthopaedics for complaints of low back ache radiating to both lower limbs, associated with bilateral S1 radiculopathy. Clinical and radiological assessment revealed L5–S1 intervertebral disc prolapse with spinal stenosis and bilateral sacroiliitis. In view of the persistent symptoms and neurological involvement, the patient was planned for L5–S1 laminectomy and discectomy. Additionally, bilateral sacroiliac joint injections were administered under general anesthesia for the management of sacroiliac joint-related pain.

Investigations and Diagnosis

Routine hematological, biochemical, and radiological investigations were performed. Hematological parameters, including hemoglobin, total leukocyte count, platelet count, and erythrocyte sedimentation rate, were within acceptable limits. Renal and liver function tests were within normal limits. Lipid profile revealed a total cholesterol of 158 mg/dL, triglycerides 110 mg/dL, LDL cholesterol 95 mg/dL, HDL cholesterol 31 mg/dL, and VLDL cholesterol 22 mg/dL. Blood glucose evaluation showed a random blood sugar of 117 mg/dL, fasting blood sugar of 133 mg/dL, and HbA1c of 6.1%, consistent with known Type 2 diabetes mellitus. Thyroid function tests showed T3: 0.64 ng/mL, T4: 5.31 µg/dL, and TSH: 10.95 µIU/mL, suggestive of hypothyroidism.

Echocardiography demonstrated mild concentric left ventricular hypertrophy (LVH) with no

regional wall motion abnormalities (RWMA) and good left ventricular systolic function.

Magnetic Resonance Imaging (MRI) of the lumbar spine revealed Grade I retrolisthesis of L5 over S1 with a diffuse disc bulge and central disc protrusion at the L5–S1 level, associated with a calcified disc, resulting in lumbar spinal stenosis and bilateral S1 nerve root compression, consistent with bilateral S1 radiculopathy. These radiological findings, together with the clinical presentation, confirmed the diagnosis of L5–S1 intervertebral disc prolapse with calcified disc, spinal stenosis, and bilateral sacroiliitis.

Clinical Course

The patient was admitted to the Department of Orthopaedics with complaints of low back ache radiating to both lower limbs and was diagnosed with L5–S1 intervertebral disc prolapse with calcified disc, lumbar spinal stenosis, bilateral S1 radiculopathy, and bilateral sacroiliitis. Following preoperative evaluation and optimization of comorbid conditions, including Type 2 diabetes mellitus, dyslipidemia, and hypothyroidism, the patient underwent L5–S1 laminectomy and discectomy, along with bilateral sacroiliac joint steroid injections under general anesthesia on 19 March 2026. During the postoperative period, the patient received intravenous antibiotics, analgesics, proton pump inhibitor therapy, neuropathic pain medication, and supportive care, while his regular medications for diabetes, dyslipidemia, hypothyroidism, and benign prostatic hyperplasia were continued. The postoperative course was uneventful, with clean surgical wounds, gradual improvement in radicular pain, and successful ambulation. The patient remained hemodynamically stable throughout the hospital stay and was discharged in an improved condition with advice on



medications, wound care, activity modification, and follow-up.

DISCUSSION

Lumbar intervertebral disc prolapse (IVDP) is one of the most common causes of low back pain and radiculopathy, with the L5–S1 level being the second most frequently affected site because of the increased biomechanical stress across the lumbosacral junction. However, calcified lumbar disc prolapse in adults is uncommon, making the present case clinically significant. Similar observations have been reported by Akhaddar et al., who described calcified lumbar disc herniation in adults as a rare condition that often presents with persistent radicular symptoms and usually requires surgical management.

The present case involved a 69-year-old male who presented with low back pain radiating to both lower limbs associated with bilateral S1 radiculopathy. MRI revealed L5–S1 intervertebral disc prolapse with a calcified disc, lumbar spinal stenosis, and bilateral sacroiliitis. These findings are comparable to those reported by Harada et al., where elderly patients with calcified lumbar disc herniation commonly presented with chronic low back pain, radiculopathy, and significant neurological symptoms requiring advanced imaging for definitive diagnosis.

Unlike uncomplicated lumbar disc herniation, calcified discs are less likely to regress spontaneously because of their rigid nature and chronic inflammatory changes. This often results in prolonged nerve root compression and persistent symptoms. Similar findings have been described by Gao et al., who reported that calcified lumbar disc herniation is associated with chronic pain, severe neural compression, and poorer response to conservative treatment compared with non-calcified disc prolapse.

Although conservative treatment is considered the first-line approach for lumbar disc prolapse, surgery is indicated in patients with persistent radicular pain, neurological deficits, or spinal canal stenosis. In the present case, the coexistence of a calcified L5–S1 disc, bilateral S1 radiculopathy, spinal stenosis, and bilateral sacroiliitis warranted L5–S1 laminectomy with discectomy, along with bilateral sacroiliac joint steroid injection. This management strategy is consistent with the findings of the SPORT Trial conducted by Weinstein et al., which demonstrated that surgical decompression provides superior pain relief and functional improvement in appropriately selected patients compared with prolonged conservative management.

The patient's multiple comorbidities, including Type 2 diabetes mellitus, dyslipidemia, and hypothyroidism, required careful perioperative optimization. Despite these risk factors, the patient experienced an uneventful postoperative recovery with improvement in pain, successful ambulation, and satisfactory wound healing. Similar favorable postoperative outcomes have been reported by Resnick et al., who concluded that timely surgical decompression in patients with symptomatic lumbar disc herniation leads to significant neurological recovery and improved quality of life.

Another noteworthy feature of the present case is the coexistence of bilateral sacroiliitis with calcified lumbar disc prolapse. Sacroiliac joint pathology may contribute to persistent low back pain and can coexist with lumbar degenerative disorders, making diagnosis challenging. Manchikanti et al. emphasized that appropriate identification and management of sacroiliac joint pathology, including image-guided steroid injections, can significantly improve pain control



and functional outcomes when performed in selected patients.

Overall, the present case highlights the importance of comprehensive clinical evaluation, detailed radiological assessment, and individualized treatment planning in elderly patients presenting with chronic low back pain and radiculopathy. Early diagnosis and timely surgical intervention resulted in an excellent clinical outcome despite the presence of multiple comorbidities and the rare occurrence of a calcified lumbar disc. This case adds to the limited literature on L5–S1 calcified intervertebral disc prolapse in adults and supports the role of surgical decompression in achieving favorable neurological and functional recovery.

CONCLUSION

Calcified L5–S1 intervertebral disc prolapse is a rare cause of chronic low back pain and radiculopathy in adults, often presenting with persistent neurological symptoms due to prolonged nerve root compression. This case highlights the importance of correlating clinical findings with radiological imaging to establish an accurate diagnosis, particularly in elderly patients with associated spinal stenosis and multiple comorbidities. Timely surgical management with L5–S1 laminectomy and discectomy, combined with bilateral sacroiliac joint steroid injection, resulted in significant symptomatic improvement and an uneventful postoperative recovery. This case emphasizes that early diagnosis, appropriate patient selection, and prompt surgical intervention can lead to favorable functional and neurological outcomes in patients with calcified lumbar disc prolaps.

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HOW TO CITE: Rejitha M S, Agnes R P, Alnon L J, Cherian Jacob, Shaiju S Dharan, Intervertebral Disc Prolapse (IVDP) L5-S1 with Calcified Disc: A Case Report, *Int. J. of Pharm. Sci.*, 2026, Vol 4, Issue 8, 1322-1327. <https://doi.org/10.5281/zenodo.21839730>

