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Ablation of Rami Communicans in Patients with Symptomatic Schmorl's Nodes: A Case Report

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ABSTRACT

Introduction: Schmorl's node is a herniation or extrusion of an intervertebral disc nucleus into the end plate of an adjacent vertebral body. This case study aims to report a patient with symptoms of axial pain followed by MRI overview that supports the clinical symptoms.
Presentation case: A man, 36 years old, working as a soldier, came to the hospital with complaints of low back pain. The patient is referred by an orthopedic doctor. The patient complained of lower back pain 2 years ago. Initially, the pain was intermittent, but in recent months it has been continuous. The pain gets worse when the patient gets out of bed, moves, and performs movements such as bowing, breathing, and coughing. The pain subsides when the patient is in a lying position. Physical examination showed pain intensity based on a visual analogue scale (VAS) 8-9/10. Examination of the extremities showed 5/6 motor strength in all extremities. Facet loading test: positive extension, forward bending (+). Anteroposterior/lateral lumbosacral X-ray examination showed no abnormalities. MRI examination showed degenerative disc disease and Schmorl's nodes corpus VL 1-2-4-5 (Figure 1). The patient was diagnosed with chronic discogenic et causa Schmorl's node pain.
Conclusion: Ablation of rami communicans is useful in the management of Schmorl's node pain.
Keywords. ablation, herniation, intervertebral disc rami communicans, Schmorl's node.

Introduction

Schmorl's nodes were first described by Schmorl in 1927 as they are classically known as intervertebral disc herniations. Schmorl's node is a herniation or extrusion of an intervertebral disc nucleus into the end plate of an adjacent vertebral body. Hernia tissue has the appearance of a lesion on the upper or lower surface of the involved vertebra. Lesions may occur on the central or posterior vertebral axes close to the thoracolumbar junction. The presence of trauma or stress transmitted through weak vertebral body endplates is the basis of the pathogenesis of Schmorl's node formation. This can be due to factors intrinsic to the endplate (presence of indentations, ossification gaps, vascular channels, and Scheurmann's disease) or factors extrinsic or acquired (infection, malignancy, osteoporosis or osteomalacia, hyperparathyroidism, Paget's disease).[1-5]

Weakening of the vertebral endplates is not an absolute prerequisite for the extrusion of intervertebral discs, only a small portion of Schmorl's nodes is formed due to weak endplates. Most of Schmorl's nodes form after axial load trauma resulting in preferential extrusion of vertebral disk nuclear material through the vertebral endplates instead of through the normal annulus fibrosus.[6-8] In general, Scmorl's nodes are asymptomatic and are often discovered incidentally, especially on MRI overview. To date, there are only a few case reports of Schmorl's nodes showing painful symptoms. This case study aims to report a patient with symptoms of axial pain followed by an MRI overview that supports the clinical symptoms.

Case Presentation

A man, 36 years old, working as a soldier, came to the hospital with complaints of low back pain. The patient is referred by an orthopedic doctor. The patient complained of lower back pain 2 years ago. Pain does not radiate. Initially, the pain was intermittent, but in recent months it has been continuous. The pain gets worse when the patient gets out of bed, moves, and performs movements such as bowing, breathing, and coughing. The pain subsides when the patient is in a lying position.

The patient has been undergoing treatment for 2 years with ibuprofen, diclofenac sodium, methylprednisolone, gabapentin and paracetamol, and sometimes tramadol. The drug is only taken when visiting a doctor. The patient has also undergone physiotherapy for 5 months. In the last 2 months, the pain has gotten worse. The patient is referred to a pain clinic for further pain therapy. Activity history of military training patients with a load of 25 kg doing regular running, jumping, and jumping. The patient did his last strenuous exercise about 3 months ago.

Physical examination showed pain intensity based on a visual analogue scale (VAS) 8-9/10. Examination of the extremities showed 5/6 motor strength in all extremities. Facet loading test: positive extension, forward bending (+). Anteroposterior/lateral lumbosacral X-ray examination showed no abnormalities. MRI examination showed degenerative disc disease and Scmorl's nodes corpus VL 1-2-4-5 (Figure 1). The patient was diagnosed with chronic discogenic et causa Schmorl's node pain.

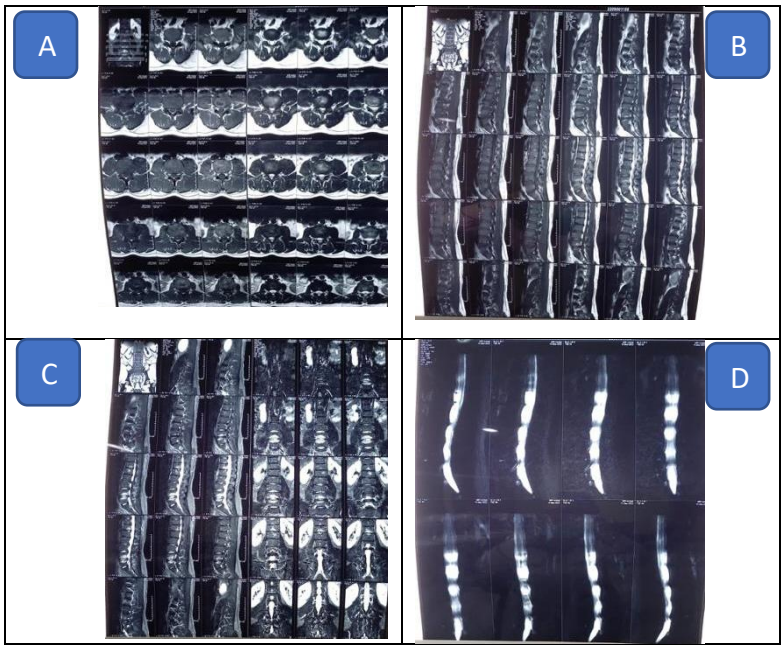

Figure 1. MRI examination results. (A) MRI axial sections of T1 and T2; (B) T1 sagittal section; (C) MRI T2; (d) T2 section.

The patient was managed conservatively with medication and physiotherapy on the first visit to the clinic. The treatment given was ibuprofen 200 mg/6 hours, paracetamol 500 mg/8 hours, tramadol 50 mg/8 hours, gabapentin 300 mg/8 hours, and bisacodyl 10 mg/24 hours at night. At the second visit, the pain was still present, with a VAS of 6-7/10. Pain intervention in the form of blocks of rami communicans. If the block results are positive, the ablation procedure is continued. After blocking with lidocaine 1 cc, the pain disappeared by more than 50%. The procedure was followed by radiofrequency ablation with a temperature of 82% and injection of 5 mg dexamethasone on both sides post-ablation (Figure 2). The results of post-operative observations are presented in Table 1.

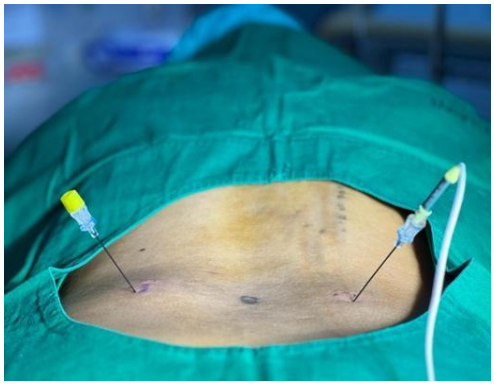

Figure 2. Radiofrequency ablation of rami communicans.

Table 1. Patient monitoring.

Day	Examination results	Handling
Day 7	No signs of infection VAS 3/10	Ibuprofen 4x200 mg Paracetamol 3x500 mg Gabapentin 3x100 mg
Day 14	VAS 1-2/10	Paracetamol 3x500 mg Gabapentin 3x100 mg Rest from strenuous exercise
Day 21	VAS 0	Recommendations for occupational modification

Discussion

Schmorl's node (SN) is a spinal lesion in the thoracolumbar region. This benign pathological presence is also known as intraosseous disc herniation or Geipei herniation. In contrast to a disc herniation that is horizontal towards the spinal canal or neural foramen, SN is a herniated nucleus pulposus in a vertical direction, namely the cartilage and vertebral endplates adjacent to it. The incidence of SN is very high and is associated with lumbar disc problems and low back pain. A number of pathogenesis theories have been proposed, but until now, there has been no consensus.[9,10] Previous studies identified SN as a degenerative process of bone disease and resulted from the pathology of weakened discs and vertebral bodies.[11-13] The presence of trauma can also contribute to the development of SN. Even so, the pathogenesis, clinical significance, and management of SN cannot be clearly formulated and are still under debate.

SN develops as a result of the weakening of the vertebral endplate, which can be caused by acute, chronic, or embryogenic processes. Chronic processes include degenerative processes and autoimmune processes. Chronic degeneration of the vertebral endplates, such as in osteoporosis, Paget's disease, hyperparathyroidism, infections, tumors, and Scheuermann's

disease, leads to weakening of the vertebral endplates and disc herniation into the vertebral body and development of SN. Exposure of the intervertebral disc (avascular tissue) to the vertebral body (well-vascularized tissue) triggers an immune response. Hence, the autoimmune process is not direct but the result of other degenerative processes.[14,15]

SN is often asymptomatic or asymptomatic and may be found as an incidental finding, or it may present as low back pain as presented in this case. The gold standard supporting examination for diagnosing SN is MRI. In symptomatic cases, the cause of pain in SN is due to herniation of the nucleus pulposus into the bone marrow of the vertebral bodies, which causes inflammation and edema. However, radiological signs of inflammation were not found in asymptomatic cases. In addition, MRI helps rule out malignant bone lesions. On computed tomography (CT scan), SN appears as a lytic bone lesion. The role of plain radiography in the diagnosis of SN is limited; it cannot detect radiological signs of inflammation; however, it can detect calcifications around the SN.[16-19]

Conservative treatment, including pain medication, exercise, weight loss, bed rest, warm compress, massage, and physical therapy, is the first line of treatment for disc herniation. Several interventional modalities can be used in cases unresponsive to conservative treatment, such as lumbar spine fusion surgery of the vertebral endplates, block of rami communicans on each side of the gray ramus, infusion of tumor blockade necrosis factor-alpha (TNF-α) and vertebroplasty percutaneous fluoroscopy.[20,21]

Conclusion

Ablation of rami communicans is beneficial in the management of Schmorl's node pain.

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