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CASE REPORT: LOW BACK PAIN EC HERNIA NUCLEUS PULPOSUS IN A 44-YEAR-OLD MALE PATIENT

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ABSTRACT

This study describes a case of Ischialgia caused by hernia nucleus pulposus (HNP) in a 44-year-old male patient. The patient presented with complaints of pain in the buttocks radiating to the right leg, accompanied by tingling and numbness, particularly after heavy physical activity. The diagnosis was established through anamnesis, physical examinations such as the Lasegue, Bragard and Socard tests, and MRI imaging, which revealed bulging discs at L1-2, L2-3, L3-4, L4-5, and L5-S1. Management was conducted using a holistic approach, including pharmacological therapy (NSAIDs, muscle relaxants, and vitamin B12), physiotherapy, and a lumbar corset to support spinal stability. After four days of treatment, the patient showed significant improvement, with the Visual Analog Scale (VAS) pain score decreasing from 8 to 3, normal motor strength recovery, and improved walking ability. Lifestyle modification education was provided to prevent recurrence, such as reducing heavy physical activities and engaging in controlled physical exercises. These results emphasize the importance of early diagnosis and multidisciplinary therapy in managing HNP cases to enhance the patient's quality of life. This case contributes significantly to clinical practice by demonstrating the effectiveness of an integrated approach in optimally managing HNP.

Introduction

Low back pain (LBP) is a condition defined as pain and discomfort in the lumbar region, i.e., the lower back, below the costal margin and above the inferior gluteal fold, with or without leg pain (World Health Organization, International Classification of Diseases, 11th Revision, 2024); (Ammer et al., 2022). The lumbar spine, comprising the soft tissues, vertebrae, zygapophyseal joints, sacroiliac joints, intervertebral discs, and neurovascular structures, is susceptible to various stressors, each of which, either individually or in combination, can contribute to LBP (Nick Knezevic et al., 2021); (Hanhivaara, 2024). LBP can be classified as either specific or non-specific. Specific LBP is characterized by pain caused by a specific disease or structural problem in the spine or when the pain radiates from other parts of the body (Shashi & Atul, 2024). Non-specific LBP is defined as pain for which it is not possible to identify a specific disease or structural reason to explain the pain. It is important to note that LBP is non-specific in about 90% of cases (World Health Organization, 2023). This case highlights the urgent need for early recognition and intervention in patients with herniated nucleus pulposus (HNP) to prevent long-term disability and improve quality of life. The patient's significant clinical improvement within four days underscores the importance of a prompt and integrated therapeutic approach. These findings stress the critical role of early diagnosis and immediate multidisciplinary management in reducing the burden of HNP-related morbidity.

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Ischialgia, characterized by the onset of leg pain radiating from the lower back, is frequently associated with low back pain (LBP), according to Camino et al. (2023). However, it is important to note that in 90% of cases, ischialgia is attributed to disc herniation with nerve root compression (Camino et al., 2023). While lumbar stenosis and tumours are also contributing factors, they are uncommon. The specific nerve involved in ischialgia plays a pivotal role, providing direct motor function to the hamstrings and adductors of the lower extremity and indirect motor function to the calf muscles, anterior lower leg muscles, and select intrinsic leg muscles. Additionally, its terminal branches contribute indirectly to sensation in the posterior and lateral lower leg and the plantar aspect of the foot (David et al., 2024). The patient's condition reflects a common clinical scenario seen in hospital and primary care settings, where lumbar disc herniation contributes significantly to back pain and disability. With a global prevalence estimated at 1–3%, HNP represents a substantial burden on healthcare systems. Furthermore, up to 90% of ischialgia cases are attributable to disc herniation, reinforcing the need for clinicians to be well-versed in timely diagnosis and intervention strategies.

Hernia nucleus pulposus (HNP) has been identified as the most prevalent aetiology of ischialgia, with an epidemiological prevalence ranging from 1 to 3%, exhibiting a peak incidence between the ages of 30 and 50, and demonstrating a higher incidence in males compared to females. The intervertebral disc is composed of cartilaginous endplates, the annulus fibrosus (AF), and the nucleus pulposus (NP) (Wasnbaum et al., 2023). HNP arises from degenerative changes in the annulus, including age-related adaptive modifications to the disc structure, such as desiccation, fissures, disc narrowing, degeneration, intradiscal gas (vacuum), osteophytes, inflammatory changes, and subchondral sclerosis (De Cicco et al., 2023). Furthermore, factors such as obesity, smoking, height, and occupation have been identified as contributing to the development of HNP. Work-related factors, such as physical workload, strenuous labour, extended work hours, and occupational stress, are believed to be significant contributors to intervertebral disc pathology (Nikol Zeilinska et al., 2021).

A physical examination revealed complaints such as sensory loss, weakness, pain location, and reflex loss associated with a solitary nerve lesion due to compression by a disc herniation in the lumbar spine (Dydyk et al., 2023). A comprehensive neurologic examination of the bilateral lower extremities was performed, including tests of motor strength and sensation (Andrew S. et al., 2023). Magnetic resonance imaging (MRI) is the gold standard for diagnosing HNP, with a reported diagnostic accuracy of up to 97%. It is particularly adept at visualizing disc herniation due to its capacity to discern soft tissue (Al Qaraghli et al., 2023). Following the diagnosis of HNP, the patient was managed with bed rest for one to two days, avoiding prolonged sitting, and was advised to engage in slow and controlled physical activity, particularly bending forward and lifting objects, along with the administration of NSAID drugs. Additional treatment modalities are recommended, such as specialized exercise physiotherapy to strengthen the lower back and abdominal muscles (Park Daniel, 2022). This case report details the case of a 44-year-old male patient diagnosed with ischialgia extra ec herniated nucleus pulposus and the subsequent management plan that was implemented. This case report aims to describe the clinical presentation, diagnostic process, and multidisciplinary management of a 44-year-old male patient with ischialgia due to herniated nucleus pulposus (HNP). By highlighting the urgency of early intervention and the epidemiological prevalence of HNP, this study seeks to provide valuable insights for clinical practitioners in identifying and managing similar cases effectively to improve patient outcomes and prevent long-term disability.

Method

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This research report was prepared using the case report method, which involves a detailed clinical case description obtained from patient data. The researcher obtained the data from anamnesis, physical examination, supporting examination, and observation of the patient's condition during treatment. The following method analyzes the patient's clinical course, diagnosis, therapy, and risk factors that may affect this case. The report presents a case study of a 44-year-old male patient afflicted with dextra ischialgia, a condition caused by herniated nucleus pulposus (HNP), thereby serving as a reference point for clinical practitioners.

The subject of this case report is a 44-year-old male patient who presented with lower back pain radiating to the right leg, with accompanying neurological symptoms. The sample was selected through purposive sampling, based on clinical presentation and confirmed diagnosis. As a case report, the study does not involve independent and dependent variables in the traditional sense. However, the clinical focus variables observed include: 1) Primary variable: Presence and progression of ischialgia and HNP. 2) Secondary variables: Pain intensity (measured using the Visual Analog Scale), motor strength, sensory disturbances, reflex responses, and imaging findings. Data Collection Instruments The instruments used in data collection for this case report include: 1) Anamnesis guide sheet – used to systematically collect information regarding the patient's history, symptoms, and risk factors. 2) Physical examination checklist – a structured form documenting findings related to posture, movement, and spinal tenderness. 3) Neurological assessment tools, including: Lasegue test, Bragard test, Sicard test, Deep tendon reflex examination sheet. 4) MRI imaging protocol – to assess intervertebral disc pathology and confirm the presence of HNP. 5) Laboratory test report forms – to record relevant biochemical and hematological parameters. 6) VAS (Visual Analog Scale) – a standardized scale to evaluate and monitor the intensity of pain reported by the patient over time. 7) Observation checklist – to record patient responses, clinical changes, and treatment effects during hospitalization. Data Analysis: The analysis in this case report is descriptive and qualitative. It involves interpreting clinical findings, diagnostic results, and patient outcomes based on medical reasoning and comparison with existing literature. The patient's progress before and after intervention is evaluated to highlight the effectiveness of a multidisciplinary treatment approach.

Results

A 44-year-old male patient reported experiencing discomfort in the lower back region, which subsequently radiated to the right lower extremity, rendering it immobile. These symptoms first manifested approximately three days after the patient had lifted goods while ascending stairs. Initially, the discomfort was described as moderate, and it persisted continuously. The severity of the discomfort increased when the patient was in a seated or walking position. The patient reported a tingling and numbness, particularly in the back and the sole of the right foot. The intensity of the complaints diminished when the patient rested. Prior to this episode, the patient had sought treatment at the Puskesmas and received analgesics, but this did not result in any improvement. The patient had previously experienced joint pain three months prior to the onset of the current complaints and had undergone uric acid, blood sugar, and cholesterol testing. The results revealed hyperuricemia, while the blood sugar and cholesterol levels were normal. Since then, the patient has been prescribed uric acid medication, and his complaints have improved. Similar complaints were found in the patient's family. The patient works as an expedition courier and mechanic at a garage from 9:00 to 18:00 WIB. The patient often lifts goods and engages in heavy activities. His diet consists of three daily meals, typically rice and various side dishes. Notably, the patient has reduced his consumption of offal, following the physician's counsel in light of his previous health condition.

A physical examination of the patient revealed the following findings: a Glasgow Coma Scale score of 15, blood pressure of 106/91 mmHg, pulse frequency of 66 beats per minute, respiratory frequency of 21 breaths per minute, and body temperature of 36.6°C. The patient's

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pain scale registered at 8, and the patient's weight was documented as 64 kilograms, with a height of 165 centimetres. The patient's nutritional status was good, with a Body Mass Index (BMI) of 23.5 kg/m2. Other examinations yielded typical results. A thorough examination of the cranial nerves and upper limbs revealed no abnormalities. However, the examination of the lower limbs revealed abnormalities on the right, characterized by impaired motor function, reduced strength, and positive physiological patellar and Achilles reflexes, with no evidence of pathological reflexes. There was no loss of sensation or abnormal creaking. The Lasegue test result was less than 70°, the Kernick test result was less than 135°, and the Bragard and Sikard tests were positive. The Patrick and Contra Patrick tests were negative. Patrick and Contra Patrick's tests were negative.

Laboratory tests resulted in an elevated leukocyte count of 11.8/µL (see Table 1 for details). A radiological examination involving plain lumbar MRI revealed the presence of lumbar spondylosis, accompanied by disc herniation at the L1-2, L2-3, L3-4, L4-5, and L5-S1 levels (see Figure 1 for visual representation).

Table 1. Laboratory Test Results on 12/12/24

Parameter	Result	Normal Value	Unit
A. Hemoglobin			
- Routine Blood			
- Hemoglobin	15.9	13.2-17.3	g/dL
- Hematocrit	45.3	40-52	%
- Platelets	248	150-400	/uL
- Leukocytes	11.8	3.8-10.6	/uL
- Erythrocytes	5.00	4.7-6.1	/uL
B. Chemistry			
Calcium	1.24	1.00-1.15	mmol/L
Urea	31.1	17.0-43.0	mg/dL
Creatinine	0.76	0.6-1.1	mg/dL
Potassium	4.80	3.50-5.0	mmol/L
Sodium	137	135-147	mmol/L
Glucose (POCT)	143	70-110	mg/dL

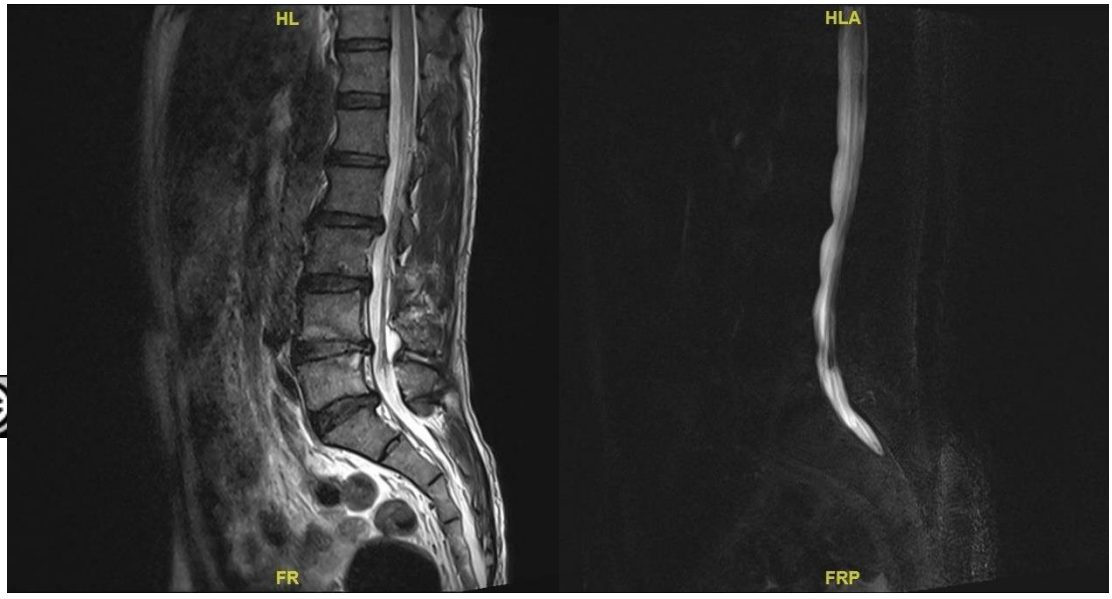

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Figure 1. Plain Lumbar MRI

A diagnosis of ischialgia dextra et hernia nucleus pulposus can be made based on the history results, physical examination, and supporting examination. The patient was administered pharmacological management, which included the installation of an intravenous line with a 500-ml saline solution administered over eight hours, an analgesic (ketorolac injection, 30 mg administered every 12 hours), and a muscle relaxant (Eperison HCL, 50 mg administered every eight hours orally). The anti-inflammatory injection of methylprednisolone (125 mg/12 hours), the Ranitidine injection (50 mg/12 hours), the mecobalamin injection (500 mcg/24 hours), and gabapentin (300 mg/24 hours) were administered orally. The patient was given a lumbar corset and underwent physiotherapy during the hospitalization period to address neuropathic pain.

Following a four-day treatment regimen at K.M.R.T Wongsonegoro Semarang Hospital, the patient exhibited notable improvements in their complaints and demonstrated the capacity to ambulate with minimal discomfort. A subsequent re-physical examination yielded a VAS pain scale 3, indicating a notable improvement. The patient exhibited normal motor movement with strength 5555/5555 in the lower limbs, positive physiological reflexes in the patella and Achilles tendon, and negative pathological reflexes. The Lasegue test yielded a result >70°, as did the Bragard, Sikard, and Patrick tests. The contra Patrick test was negative. The patient also diligently utilizes a lumbar corset and adheres to the prescribed physiotherapy regimen.

The patient was discharged and prescribed the following medications: gabapentin 300 mg every 24 hours, eperisone HCL 50 mg every 8 hours, vitamin B12 50 mg every 8 hours, diclofenac sodium 50 mg every 8 hours, and ranitidine 150 mg every 12 hours. The patient's final prognosis was favourable. The patient was also educated on modifying movements, including lifting items, changing the sitting position, bending, and getting up.

Discussion

Disc herniation and degenerative disc are related terms, since herniation of the nucleus pulposus is a possible evolution of a degenerative disc. Disc degeneration is usually associated with the loss of proteoglycans, and various factors influence the degenerative process, such as genetic, mechanical, and behavioral factors (De Cicco et al., 2023); (Isa et al., 2021). Based on the above-mentioned theories, in this case, the patient first experienced complaints after heavy lifting and climbing stairs. Given the patient's regular involvement in these activities, it can be concluded that behavioral factors play an important role in the development of the degenerative process. Neurological examination can play an important role in localizing the level of compression, as evidenced by a previous study by Dydyk et al. (2023). This examination can reveal sensory loss, weakness, location of pain, and loss of reflexes associated with different levels. One important example is the L5 nerve root, which exits at the L5-S1 foramen, as described in the study by De Cicco et al. (2023) reported. Compression of this nerve root by a herniated disc can cause back pain that radiates to the lower back, lateral thigh, lateral calf, dorsum of the foot, and toes study by (Tesio, 2025). Sensory loss also occurs between the big toe and second toe, dorsum of the foot, and lateral calf study by (Felicetti et al., 2021). Weakness is observed in hip abduction, knee flexion, foot dorsiflexion, big toe dorsiflexion, foot inversion, and eversion study by (Roth & Roth, 2017). Patients may have decreased semitendinosus/semimembranosus reflexes, and weakness in foot dorsiflexion may hinder ambulation in a standing position. Chronic L5 radiculopathy can cause atrophy of the extensor digitorum brevis and tibialis anterior in the anterior leg (Al Qaraghli et al., 2023). This theory is consistent with the patient's reported symptoms, including pain in the lower back and right leg and difficulty moving. Other complaints included numbness and tingling sensations, particularly

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in the lower back and right leg, which were related to the location of the compression level at the L5 spinal cord. The patient's Plain Lumbar MRI confirmed these findings, revealing disc bulges, particularly at the L4-L5 and L5-S1 levels.

The Straight Leg Rise or Lasegue test is a diagnostic tool for detecting disc herniation. This test is classified as a neurodynamic evaluation test, given its ability to identify excessive nerve root tension or compression. The test is considered positive if the radial leg pain radiates below the knee, and the pain is felt when the leg is between 30° and 60° or 70° from the horizontal (Das Joe et al., 2024). The Bragaard sign, a maneuver involving dorsiflexion of the leg to aggravate pain in an elevated position, can be used to increase the sensitivity of the test (Camino et al., 2023). The Sicard test, which involves passive toe extension, can reinforce a positive straight leg test. In this case, the patient's physical examination results on the Lasegue test are positive (less than 70°), and the Bragaard and Sicard tests are positive, indicating nerve root tension or compression. The patient was given initial treatment in the form of NSAIDs during hospitalization, including ketorolac injections 30 mg/12 hours and physiotherapy. This approach is in line with the findings of Dydyk et al., who reported that nonsteroidal anti-inflammatory drugs and physical therapy are the first-line treatment modalities for HNP disease, as studied by (Dydyk et al., 2023). The WHO analgesic ladder categorizes pain into three levels. Severe pain (VAS 7-10) is treated with NSAIDs, potent opioids with or without nonopioid analgesics, and with or without adjuvants. For patients classified at the third level with a VAS of 8, additional drugs are given, including gabapentin 300 mg/24 hours and muscle relaxants such as eperisone 50 mg/8 hours. Lumbar disc herniation is one of the most common causes of low back pain and sciatica, with a reported prevalence of 1–3% in the general population, as studied by (Waxenbaum et al., 2025). According to WHO (2023), low back pain is the leading cause of years of disability globally. Studies have also shown that up to 90% of sciatica cases are caused by HNP, highlighting the importance of accurate diagnosis and early intervention (Camino et al., 2023). This case is in line with the biomechanical theory of intervertebral disc degeneration, which states that repetitive stress and poor posture increase disc pressure, leading to annulus tears and herniation (De Cicco et al., 2025). According to Mohd Isa et al. (2022), disc degeneration progresses through a series of structural, biochemical, and mechanical changes, influenced by occupational and lifestyle factors—both of which occurred in this patient, who worked as a courier and a mechanic. Furthermore, the neurocompression theory explains the patient's sensory and motor deficits, particularly pain radiation along a dermatomal pattern, due to mechanical pressure on the nerve roots as studied by (Tesio, 2025).

Based on this case, the authors emphasize that urgent intervention significantly improves prognosis, as the patient showed improvement within four days of treatment. The use of integrated therapy—NSAIDs, physiotherapy, muscle relaxants, and lumbar support—proved effective, supporting the idea that multidisciplinary management is essential. In our opinion, early detection through comprehensive physical and imaging examinations should be standard practice in patients with occupational risk factors to prevent chronic neurologic sequelae. We also believe that the combination of clinical experience and patient education can play a vital role in long-term recovery and recurrence prevention.

Conclusion

The pain in the lower back that radiates to the leg, or ischialgia, can indicate herniated nucleus pulposus. Herniated nucleus pulposus disease diagnosis is based on a combination of factors, including the results of anamnesis, physical examination, and supporting examinations. The present case report details the case of a 44-year-old male patient who presented to K.M.R.T Wongsonegoro Semarang Hospital with a three-day history of lower back pain that radiated to

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the right leg, accompanied by difficulty walking and numbness and tingling sensations in the back and right foot. The pain was exacerbated during sitting and walking.

The patient exhibited signs of ischialgia dextra, as indicated by a pain rating of 8 on the Vas pain scale. Their nutritional status was found to be within normal parameters. A physical examination of the lower limbs on the right revealed motor movement limitations and reduced strength, with a score of 3333/555 on the modified Ashworth scale. The Lasegue test yielded results below 70°, and both the Bragard and Sikard tests were positive. Consequently, the patient was diagnosed with ischialgia dextra et herniated nucleus pulposus, as evidenced by the MRI findings, which revealed lumbar spondylosis and disc herniation at the L1-2, L2-3, L3-4, L4-5, and L5-S1 levels. It is imperative to educate patients about the risk factors and triggers for HNP, which excessive daily activities can exacerbate. HNP can adversely impact the patient's quality of life if not appropriately addressed, necessitating effective management and lifestyle modification. Furthermore, patients must be educated on compliance with pharmacological and non-pharmacological treatments, including physiotherapy, and the potential complications associated with these interventions.

Herniated nucleus pulposus (HNP) is a common spinal disorder with a prevalence of 1–3% and is responsible for up to 90% of sciatica cases globally. In this case, the patient presented with classic symptoms of ischialgia and was diagnosed with HNP at multiple lumbar levels. Early, accurate diagnosis supported by MRI and neurological assessment led to a favorable outcome within a short period of hospitalization. This clinical case supports biomechanical and neurocompression theories, which explain that physical strain and mechanical stress on the intervertebral discs can lead to annular rupture and nerve root compression (De Cicco et al., 2025; Tesio, 2025). These theories help explain the patient's symptom pattern and rapid improvement following decompression strategies. From a clinical standpoint, we believe that timely and comprehensive management of HNP is critical to prevent long-term disability. This case emphasizes the value of combining pharmacological, physical, and lifestyle interventions to address both the physical pathology and its underlying risk factors. We recommend that clinicians adopt a multidisciplinary, patient-centered approach in similar cases and raise awareness among high-risk populations about proper lifting techniques and posture to prevent recurrence.

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