Advances in Outpatient Nursing Strategies for Lumbar Disc Herniation: Postprint

Authors: Zhang Hua, Zhang Pei

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Abstract

Intervertebral discs constitute critical supporting structures of the spine, and their herniation represents a major source of low back pain and sciatica. Lumbar disc herniation is a pathological condition wherein degenerative changes of the lumbar intervertebral disc and rupture of the annulus fibrosus lead to protrusion of the nucleus pulposus, which irritates or compresses nerve roots, manifesting clinically as a common syndrome characterized by lumbocrural pain and paresthesia. As a frequent presentation in outpatient settings, this paper primarily explores the principal etiological factors of lumbar disc herniation and corresponding outpatient nursing strategies.

Full Text

Research Progress on Outpatient Nursing Strategies for Lumbar Disc Herniation

Zhang Hua, Zhang Pei
West Hospital, Dongfang Hospital, Beijing University of Chinese Medicine, Beijing

Abstract

The intervertebral disc is a crucial supporting structure of the spine, and its herniation represents a significant source of low back pain and sciatica. Lumbar disc herniation is a common syndrome caused by degenerative changes in the lumbar intervertebral discs and rupture of the annulus fibrosus, resulting in protrusion of the nucleus pulposus that stimulates or compresses nerve roots. Clinical manifestations typically include low back pain, leg pain, and numbness. As lumbar disc herniation is frequently encountered in outpatient settings, this paper primarily explores the main pathogenic factors and outpatient nursing strategies for this condition.

Keywords: lumbar disc herniation; outpatient care; nursing strategies

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Lumbar disc herniation (LDH) is a common and frequently occurring orthopedic condition that causes low back and leg pain. Its pathogenesis involves multiple factors, with intervertebral disc degeneration being a fundamental causative element. Long-term repetitive stress, improper weight-bearing, or poor sitting posture can accelerate degenerative changes in the intervertebral discs.

The intervertebral disc consists of three anatomical components: the cartilage endplate, annulus fibrosus, and nucleus pulposus. Normal lumbar intervertebral discs measure approximately 8-10 mm in thickness—greater than cervical and thoracic discs—and account for about 20-25% of the total spinal length. As the most critical component for bearing body weight, the disc' s shape adapts to the spine' s physiological curvature, enhancing spinal mobility and providing cushioning. Normal discs possess substantial elasticity and toughness to withstand significant compressive loads. In a supine position, the pressure on lumbar discs is minimal at approximately 30 kg, while sitting increases this to about 100 kg. Healthy adult lumbar discs can withstand maximum pressures of approximately 150-200 kg.

The cartilage endplate is primarily composed of hyaline cartilage and functions to supply water and nutrients to the nucleus pulposus. In normal adults, the cartilage endplate generally lacks blood vessels and nerve endings, so injuries do not produce pain-inducing inflammatory mediators. However, when the nucleus pulposus protrudes into vertebral bodies through defects in the cartilage endplate, it creates impressions visible on imaging as Schmorl' s nodes.

The annulus fibrosus consists of robust collagen fiber bundles arranged in oblique, overlapping layers. It is thicker anteriorly and thinner posteriorly, with the posterior longitudinal ligament being narrow and thin. This specialized crossed-oblique arrangement enables the lumbar region to withstand substantial torsional and bending loads while increasing spinal flexibility for lateral flexion and extension. However, this same structure also renders the nucleus pulposus more prone to posterior-lateral protrusion through weak areas.

With aging, the water content of the nucleus pulposus gradually decreases, leading to progressive disc degeneration. This results in diminished elasticity and tension, consequently reducing load-bearing capacity. Under repetitive compressive loading, long-term torsional and flexion movements create shear stresses that cause fissures to develop from inner to outer layers of the posterior annulus fibrosus. Over time, these fissures progressively enlarge, weakening the annulus fibrosus and potentially causing rupture. Under increased load, degenerated nucleus pulposus tissue can more easily bulge or herniate through weak or ruptured areas of the annulus fibrosus.

Based on this degenerative foundation, heavy trauma during daily activities, repeated minor injuries, or sudden increases in lumbar disc pressure from weight-

bearing can further aggravate annulus fibrosus rupture and accelerate degenerative changes. This allows degenerated nucleus pulposus tissue to protrude or herniate through weak or ruptured areas, compressing nerve roots or cauda equina and causing clinical manifestations of low back pain, radiating leg pain, and cauda equina functional impairment.

1 Pathogenesis and Common Treatment Methods

Lumbar disc herniation is a prevalent condition that frequently causes low back and leg pain, with over 80% of patients experiencing low back pain. Additional symptoms may include lower extremity radiating pain, intermittent claudication, cauda equina syndrome, and physical signs such as lumbar scoliosis, limited spinal mobility, tenderness, positive straight leg raise test, and diminished sensory and motor function, significantly impacting patients' work and quality of life. The condition can occur at any age but most commonly affects middle-aged and elderly individuals, with higher prevalence in males.

Treatment approaches for lumbar disc herniation are broadly categorized into non-surgical and surgical interventions. Most patients experience symptom relief through non-surgical treatment, though conservative therapy proves ineffective for some cases requiring surgical intervention. Surgical treatment more effectively alleviates radiating lower extremity pain and positively impacts overall health recovery, psychological well-being, and social function. Percutaneous transforaminal endoscopic discectomy currently represents the least invasive spinal surgical approach, offering advantages of minimal trauma, reduced bleeding, and rapid recovery.

Non-surgical treatment constitutes the fundamental therapeutic approach for lumbar disc herniation, encompassing methods such as bed rest, traction, manual therapy, pharmacological treatment, and non-pharmacological interventions (including traditional Chinese medicine characteristic treatments and physical therapy). Although numerous non-surgical options exist, clinical application requires selectivity, specificity, and planning rather than simple 叠加 (superimposition) of various therapies.

Surgical treatment is indicated for patients with clear diagnosis, particularly those with severe neurological compression symptoms caused by acute trauma, bone spur formation, or cartilage detachment, especially when neurogenic bladder or bowel dysfunction has developed.

2 Clinical Nursing Care

Bed Rest and Positioning: Bed rest reduces pressure on intervertebral discs from weight-bearing and body weight, effectively relieving pain. Patients in the acute phase with sudden symptom exacerbation require absolute bed rest, while those with milder conditions should have limited activity. Responsible nurses provide relevant health education and guidance. Patients should consume

high-calorie, nutrient-rich, easily digestible foods with adequate water intake to maintain bowel regularity and prevent constipation. For positioning, when supine, nurses may instruct patients to place a thin pillow under the lumbar region with knees flexed at 60-90° to achieve lumbar relaxation. In lateral decubitus, patients should flex hips and knees with two pillows placed behind the back to maintain alignment of neck, shoulders, and waist. For patients unable to turn independently, healthcare staff should perform axial turning every 2 hours to prevent pressure ulcers and other complications.

Pain Management: Pain has become the fifth vital sign following body temperature, pulse, respiration, and blood pressure. Severe pain dominates patients' consciousness, causing cessation of all other activities. Nurses should assess pain once per shift and document findings. For patients with low back and leg pain —the most common symptoms of lumbar disc herniation that directly impact quality of life—nurses should promptly evaluate pain characteristics, intensity, duration, and location, communicate with physicians, and implement effective measures to alleviate suffering. When pain affects sleep, administer oral or intravenous analgesics as prescribed, or apply topical anti-inflammatory analgesic plasters. Instruct patients to rest on a firm mattress, as disc pressure in supine position is 50% lower than in standing position. Lumbar support braces enhance spinal stability and protect the lumbar region. Acute-phase patients may ambulate with brace support after three weeks of bed rest, typically wearing the brace for one month.

Psychological Care: Patients with lumbar disc herniation often experience prolonged disease courses, present with severe symptoms, carry heavy psychological burdens, and have high expectations for hospital treatment, making them prone to anxiety. Psychological factors correlate significantly with the occurrence, progression, and prognosis of lumbar disc herniation. Therefore, nurses should carefully assess patients' psychological characteristics, understand their anxiety origins and psychological needs, distribute educational brochures, and explain disease-related knowledge, advantages of transforaminal endoscopic surgery, and potential complications in accessible language. Facilitating communication with patients who had successful surgical outcomes helps alleviate anxiety and fear while building confidence in treatment and prognosis. Additionally, educating family members about surgical procedures and related precautions creates a supportive environment that promotes patient cooperation and recovery.

Health Education: Nurses should instruct patients on proper sitting, standing, walking, and lying postures, avoiding prolonged maintenance of any single position, and utilizing ergonomic principles. Emphasize adequate nutrition, work-rest balance, and lumbar region warmth. Explain disease-related knowledge, surgical approaches, and advantages using successful case examples to enhance patient confidence and reduce anxiety. Patients may drink water and consume light, easily digestible diets when free from nausea and vomiting.

Timely identification of primary causative factors, appropriate treatment, and

corresponding nursing interventions are crucial when patients present for outpatient care. Effective treatment and proper nursing methods achieve optimal therapeutic outcomes. Research on clinical nursing practice can improve care quality and enhance nurses' professional skills and comprehensive capabilities.

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Note: Figure translations are in progress. See original paper for figures.