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CLINICAL CASE REPORT



Effects of Acupuncture, Core-stability Exercises, and Treadmill Walking Exercises in Treating a Patient with Postsurgical Lumbar Disc Herniation: A Clinical Case Report

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Abstract

The objective of this study is to investigate the effects of acupuncture, core-stability exercises, and treadmill 12-minute walking exercises in treating patients with postsurgical lumbar disc herniation. A 34-year-old woman with a history lumbar disc prolapse who had undergone lumbar disc surgery on two different occasions was treated using acupuncture, core-stability exercises, and treadmill walking exercises three times per week for 12 weeks. The outcome measures used in this study were pain intensity, spinal range of movement, and general health. After 12 weeks of treatment, the patient had made improvement in terms of pain, which was reduced from 9/10 to 1/10. In a similar vein, the patient's general health showed improvement of >100% after 12 weeks of treatment. Pre-treatment scores of spinal flexion and left-side flexion, which measured 20 cm and 12 cm, respectively, increased to 25 cm and 16 cm after 12 weeks of treatment. This study showed that acupuncture, core-stability exercises, and treadmill walking exercises were useful in relieving pain, increasing spinal range of movement, and improving the health of a patient with postsurgical lumbar disc herniation.

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1. Introduction

The lifetime prevalence of disc herniation has been estimated at 1–3% [1,2]. Although anatomic evidence of disc herniation is said to be present in 20–40% of imaging tests among asymptomatic individuals [3,4]. Most clinically relevant herniation occurs between the ages of 30 years and 50 years, but can also occur in adolescent and older people [5]. From 2% to 5% of patients seeking help are thought to suffer disc herniation while, in about 40% of patients with low back pain seeking help, the cause is disc herniation [6,7]. Although the literature contains several reports of spontaneous regression of herniated intervertebral discs, the exact mechanism of spontaneous disc regression remains unknown [8]. Many patients with extruded lumbar disc herniation require surgical intervention. However, current surgical techniques, even though less invasive than in the past, have significant problems in terms of effectiveness, safety, and cost [9]. Similarly, studies have reported a complication rate of 24% associated with surgical interventions, with almost half of the complications being serious and 8% of patients who underwent surgery had complications [9]. These findings emphasize the importance of conservative care, which will be beneficial to most patients and have a very low complication rates [7].

Rehabilitation guidelines for postoperative management of patients undergoing spinal surgeries emphasize effective pain relief via adequate analgesia and suitable positioning coupled with patient education and advice on sitting related to patient's function, on reinforcing self-management, and on building activities appropriately. Other areas of emphasis include awareness of the importance of good posture especially in sitting including going up and down stairs. In a similar vein, exercises in the form of core-stability exercises to include leg slides, gym ball exercises, balance work, proprioceptive training, general fitness exercises, and cardiorespiratory exercises are advocated [10].

Both acupuncture and exercise have been reported to have significant effects on reducing pain and improving quality of life among back-pain sufferers. Positive reinforcement effects might coexist in the use of acupuncture, core-stability exercises, and treadmill walking exercises in the management of low back pain [7]. Acupuncture analgesia improved the noxious descending inhibitory controls and pain gate mechanism and, therefore, helped the patients' pain levels. The overall result was reduced pain, reduced functional disability due to pain, and improved well-being. Exercises remain the most frequently prescribed treatment in the management of low back disorders. Exercises for low back disorders are typically designed with the goal of relieving pain, strengthening the back, increasing back flexibility, and improving functional activities, cardiovascular endurance, and general wellness [10].

A recent focus in physiotherapy management of chronic low back pain has been to identify specific muscles that are able to stabilize the back and to enhance the activity of those muscles whose primary function is considered to be dynamic stability and segmental control of the spine. By contrast, general endurance exercises in the form of treadmill

exercises may offer greater long-term benefit than specific exercises whose effects are aimed at the lumbar spine.

In the present study, the authors theorized that global pain relief associated with acupuncture combined with improved spinal segmental movement control associated with core-stability exercises and enhanced cardiovascular endurance and general wellness associated with treadmill walking exercises might be useful in alleviating the symptoms of low-back disorders. However, the effects of various physiotherapy modalities for treating patients after lumbar disc surgery have not been widely reported. The present case study involved the use acupuncture, core-stability exercises, and 12-minute treadmill walking exercises in the treatment of a patient with postsurgical lumbar disc herniation.

2. Case report

2.1. Case presentation

Approval to carry out this study was obtained from the Research and Ethics Committee of the University of Maiduguri Teaching Hospital. Written informed consent was obtained from the patient prior to assessments and treatment.

A 34-year-old woman, who is a nurse, with a more than 2-year history of lower back and left leg pain was referred for physiotherapy treatment in June 2013. She had previously consulted an orthopedic surgeon and had been diagnosed as having a disk herniation in the right L4–5 region based on a computed tomography scan and magnetic resonance imaging results. She had undergone two surgical treatments (decompressive laminectomy), the first in 2012 and the second in 2013, with little or no changes to her symptoms.

The patient reported no red flags, such as abdominal pain, night pain, rectal bleeding, or bowel or bladder irregularities. The patient's chief complaint was low back pain that had started more than 2 years earlier. The initial back pain and leg pain on her first visit were each rated as 9/10. Pain was exacerbated by prolonged sitting and standing and was eased by moving about. Magnetic resonance imaging of the lumbar spine obtained prior to the first surgery showed a 4-mm extruded disc fragment on the left side of the spinal canal at the L4–5 level. She had no complaints of cardiac, respiratory, and/or skin sensation dysfunction.

On physical examination, the patient weighed 62 kg and was 1.65 m in height (body mass index = 22.8 kg/m²). On the 1st day of visit to our department, she walked slowly with reduced weight bearing on the left lower extremity. Pain intensity was assessed and graded using a numeric pain rating scale [11]. A modified Schober's test was used to assess spinal range of movement [12]. Active flexion and left-side flexion of the lumbar spine were limited by pain. All other active spinal ranges of motion were within normal limits and were without pain. The straight leg raise test was positive only on the left side, within a 40–70° angle raise. A prone instability test was carried out to assess segmental spinal instability; it showed a positive result indicative of spinal segmental instability in this patient [12]. The knee-jerk and the ankle-jerk tendon reflexes were intact.

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