Neck-Related Physical Function, Self-Efficacy, and Coping Strategies in Patients With Cervical Radiculopathy: A Randomized Clinical Trial of Postoperative Physiotherapy

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Abstract

Objective: The purpose of this study was to compare postoperative rehabilitation with structured physiotherapy to the standard approach in patients with cervical radiculopathy (CR) in a prospective randomized study at 6 months follow-up based on measures of neck-related physical function, self-efficacy, and coping strategies.

Methods: Patients with persistent CR and scheduled for surgery (N = 202) were randomly assigned to structured postoperative physiotherapy or a standard postoperative approach. Structured postoperative physiotherapy combined neck-specific exercises with a behavioral approach. Baseline, 3-month, and 6-month evaluations included questionnaires and clinical examinations. Neck muscle endurance, active cervical range of motion, self-efficacy, pain catastrophizing (CSQ-CAT), perceived control over pain, and ability to decrease pain were analyzed for between-group differences using complete case and per-protocol approaches.

Results: No between-group difference was reported at the 6-month follow-up (P = .05-.99), but all outcomes had improved from baseline (P < .001). Patients undergoing structured postoperative physiotherapy with ≥50% attendance at treatment sessions had larger improvements in CSQ-CAT (P = .04) during the rehabilitation period from 3 to 6 months after surgery compared with the patients who received standard postoperative approach.

Conclusions: No between-group difference was found at 6 months after surgery based on measures of neck-related physical function, self-efficacy, and coping strategies. However, the results confirm that neck-specific exercises are tolerated by patients with CR after surgery and may suggest a benefit from combining surgery with structured postoperative physiotherapy for patients with CR. (J Manipulative Physiol Ther 2017;xx:0-10)

Key Indexing Terms: *Cervical Radiculopathy; Postoperative Period; Physical Therapy Modalities; Randomized Clinical Trial; Coping Skills*

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Introduction

Cervical radiculopathy (CR) as a result of disc disease is characterized by radicular neck and arm pain with associated neurologic impairments.[1,2] This condition often leads to disability, reduced health, and sickness-related absence from work.[3]

Patients who experience persistent symptoms may be referred for surgical treatment,[4] which reportedly has overall good effects on arm pain and neurology.[4,5] However, the effects of surgery on neck functioning are more uncertain, with studies reporting persistent patient-reported disability as measured by the Neck Disability Index (NDI),[6,7] as well as impairments in neck muscle strength, neck muscle endurance (NME), and cervical active range of motion (cAROM) after surgery.[6,8,9]

Neck-specific exercises and cognitive behavioral treatments may be beneficial in other chronic neck pain disorders,[10,11] and structured physiotherapy has been suggested as treatment before as well as after surgery to improve clinical outcomes in patients with CR.[6-8,12,13] However, there is currently a lack of randomized clinical trials (RCTs) of postoperative physiotherapy in patients with CR to inform evidence-based clinical guidelines for the treatment of these patients.[4]

The present study aimed to compare rehabilitation with structured postoperative physiotherapy (SPT) against the standard postoperative approach (SA) in patients with CR based on measures of neck-related physical function, self-efficacy, and coping strategies at 6 months after surgery.

Methods

Design

We designed a multicenter RCT of postoperative physiotherapy in patients with CR, and the study was performed from February 2009 until December 2014. Patients were divided in a 1-to-1 ratio to parallel groups, and outcome measures were collected from independent blinded evaluators. Because of the nature of the study, the treating physiotherapist and the patient were not blinded to treatment allocation. This study was approved by the regional ethical review board in Linköping (Dnr M126-08) and performed in accordance with the Helsinki Declaration. The protocol was registered with the Clinical Trial Identifier (NCT01547611) and has been previously published.[14] Our previously reported results indicated no between-group differences at the 6-month follow-up with regard to the primary outcome NDI, neck and arm pain on the visual analog scale, or global outcome.[15] In this second report, we present the results for secondary outcome measures evaluating neck-related physical function, self-efficacy, and coping strategies. No serious harm or unintended effects were reported of the postoperative care.

Participants

We recruited patients who experienced persistent CR symptoms and were referred for surgery at 4 spinal centers in the south of Sweden between February 2009 and November 2012. Inclusion criteria were persistent CR symptoms for at least 2 months (median arm pain duration 12 months, 25th and 75th percentiles, 9 and 24 months), unsatisfactory improvements after nonsurgical treatments, and magnetic resonance imaging findings compatible with verified disc disease. Exclusion criteria were previous cervical surgery, cervical column fracture or traumatic subluxation, myelopathy, malignancy or spinal tumor, spinal infection, systematic disease implying a contraindication to an extensive rehabilitation, fibromyalgia or generalized myofascial pain, persistent or recurrent severe back pain, diagnosed mental disorder, drug or alcohol addiction, and lack of fluency in Swedish. The study included a total of 202 patients who gave their informed consent. The mean age was 50 years (standard deviation [SD] 8.4 years), and 52% were men. One patient was excluded because surgery was cancelled (n = 201) (Fig 1). The patients were preoperatively randomly assigned to receive either SPT or SA after surgery. The central project leader, who was not involved in any treatments or measurements, simply randomly assigned the patients using a random computer list developed by a statistician.

Surgery and Standard Postoperative Care at the Spinal Centers

Patients were operated on using anterior cervical decompression and fusion (n = 163) or posterior cervical foraminotomy with or without laminectomy (n = 38). The disc and osteophyte were removed and the segments were fused using a standard cage at each spinal center. The cage was filled with bone substitute or autologous bone collected during decompression. Two-level (n = 62) or 3-level fusions (n = 2) usually included the use of an anterior plate to achieve primary stability. Posterior cervical foraminotomy was performed without fusion at 1 level (n = 7), 2 levels (n = 15), or 3 or more levels (n = 16). During the first 6 weeks after surgery, all patients received the same standard postoperative care at the spinal centers, which included advice regarding good posture and ergonomics, recommendations to avoid certain activities and movements, and instructions for shoulder mobility exercises. After 6 weeks, patients returned to the spinal center for 1 routine visit to see the surgeon and the physiotherapist. On that occasion, patients were examined and given instructions to perform active exercises for cervical range of motion.