

on 23 healthy participants aged 27 to 69 years. In this study, 14 women and 9 men were randomly assigned to an intervention group (n=11) or a control group (n=12). Exclusion criteria were a history of known vertebral artery anomalies; hypoplasia or previous injury; undiagnosed dizziness; hypertension ($\geq 140/90$ mm Hg); head or neck trauma within the past 6 weeks; known upper or midcervical instability; recent cervical spine high-velocity, low-amplitude therapy; previous cervical spine surgery or cerebrovascular events of any kind; pregnancy; use of systemic steroids or anticoagulants; cancer; Down syndrome; Klippel-Feil syndrome; Erlos-Danlos syndrome; or if the atlantoaxial section of the vertebral artery could not be visualized on ultrasound.

The outcome measures were assessed with color flow Doppler ultrasound. The measures were hemodynamic markers of peak systolic velocity and end diastolic velocity (EDV). Secondary measures were mean velocity and a resistance index. The ultrasound transducer was held in place over the C1-C2 area throughout the procedure on all participants at 60° or less to ensure accurate measures.

The manipulation for the intervention group was to the atlantoaxial joint. The operator placed a finger over the posterior-superior aspect of the transverse process of C1 and thrust in an anterior-inferior-medial direction to the left and then returned the head to neutral. In the control group, the same setup was followed except that no thrust was applied and with the starting position held momentarily and then the head was repositioned to neutral. This description of the intervention is similar to high-velocity, low-amplitude procedures.

The continuously measured hemodynamic markers showed no statistical difference within or between the intervention and control groups on all the measures (ie, peak systolic velocity, EDV, mean velocity, and resistance index) ($P < .01$). Two markers, EDV and resistance index, at the prethrust point were statistically significant ($P < .05$). However, this finding was not hemodynamically notable

because the change was less than 25%, the cutoff for clinical relevancy.

The authors conclude that this finding adds to the building evidence for the safety of cervical spine manipulation with regard to vertebral artery derangement. As a contributor in the past decade to the American Osteopathic Association's efforts to evaluate the safety and efficacy of cervical manipulation, I believe the safety issue is well established. (doi:10.7556/jaoa.2015.128)

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Osteopathic Manipulative Therapy Shows Promise for Improving Postdiscectomy Recovery

Kim BJ, Ahn J, Cho H, Kim D, Kim T, Yoon B. Rehabilitation with osteopathic manipulative treatment after lumbar disc surgery: a randomized, controlled pilot study. *Int J Osteopath Med*. In press. doi:10.1016/j.ijosm.2014.11.003.

Lumbar discectomy is a common treatment for patients with low back pain because it can help reduce physical disability and relieve nerve root pain compared with other nonoperative treatments.^{1,2} However, many patients report continued physical disability and low back and leg pain after surgery. An interdisciplinary team of surgeons and a British-trained osteopath in South Korea published a prospective randomized controlled pilot trial to determine the feasibility and potential benefit of using osteopathic manipulative therapy (OMTh; manipulative care provided by foreign-trained osteopaths) as an integral component of a postdiscectomy rehabilitation program.

Inclusion criteria were patients aged 20 to 65 years who underwent lumbar microdiscectomy to manage low back pain and who experienced leg pain resulting from a herniated disk. The exclusion criteria were revision or combined surgery, pregnancy, metastatic disease, or mental disorder.

Thirty-three participants were randomly allocated to either the OMTh group (n=16) or the exercise program group (n=17). Two to 3 weeks after the patients underwent lumbar microdiscectomy, they returned to the hospital for their first rehabilitation session. Both interventions consisted of eight 30-minute sessions performed twice per week for 4 weeks. All patients were prescribed anti-inflammatory medication, analgesics, and muscle relaxants by the surgeons. The OMTh intervention was performed by 2 foreign-trained osteopathic students supervised by a British-trained osteopath. This group received a standardized OMTh protocol including soft tissue, myofascial release, muscle energy, progressive inhibition of neuromuscular structures, osteopathic cranial manipulative medicine, and rib raising techniques. The exercise group also followed a protocol focused on stretching, strengthening, and Pilates exercises.

Outcome measures were assessed at baseline (2-3 weeks after surgery) and a week after the final rehabilitation session (7-8 weeks after surgery) using the Roland-Morris Disability Questionnaire and a visual analog scale. Postsurgical physical disability improvement was statistically significant in the OMTh rehabilitation group at 54% vs 26% in the exercise group ($P<.05$). Residual leg pain decreased by 53% in the OMTh group and 17% in the exercise group ($P>.05$), and residual low back pain decreased by 37% in the OMTh group and 10% in the exercise group ($P>.05$). In addition, patients required less frequent use of medications in the OMTh group ($P>.05$).

The authors concluded that OMTh as a postsurgical rehabilitation intervention after lumbar microdiscectomy is a feasible and potentially beneficial approach for improving physical function and residual back and leg pain, decreasing the frequent use of medications, and leading to overall patient satisfaction. A larger, randomized controlled trial using sham therapy is warranted. The use of OMTh as a postsurgical rehabilitation inter-

vention after knee and hip arthroplasty has been shown to be a feasible approach for improving postoperative care.^{3,4} This study further supports its utility as an adjunct therapy and a potential standardized protocol for postsurgical rehabilitation. (doi:10.7556/jaoa.2015.129)

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Bodywork Shown to Reduce the Symptoms of Chronic Constipation and Improve Quality of Life

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Turkish physical therapy researchers used a bodywork modality called connective tissue manipulation (CTM) in a randomized controlled trial on patients with chronic constipation. Researchers used Rome III criteria for chronic constipation to identify 50 patients and randomly assign them to the intervention group (n=25) or to the control group