

Van Middelkoop M, Rubinstein SM, et al. Surgery versus conservative care for neck pain: a systematic review. Eur Spine J 2013;22:87-95.

Design: Systematic review of controlled clinical trials

PICOS:

- Patient population: Adults with neck pain with or without radiculopathy or myelopathy
 - o Radiculopathy and myelopathy were considered separately
- Interventions: Surgical interventions, including discectomy with or without fusion, foraminotomy, corpectomy, fusion alone, and laminotomy
- Comparison intervention: Conservative care of any kind
- Outcomes: patient reported outcomes (neck and arm pain, neck-specific functional status)
 - o Secondary outcomes include subjective improvement, proportion of patients recovered, work status, treatment complications
 - o Outcomes were considered short term if they were close to 3 months, and long term if they were closer to 12-24 months
- Study types: Controlled clinical trials, both randomized and non-randomized, provided that there were at least two groups with different treatments

Study selection:

- Databases included MEDLINE, EMBASE, CINAHL, the Cochrane Central Register, and PEDro up to June 2011
- Two authors independently selected citations for inclusion in the review, and assessed risk of bias using the Cochrane Back Review Criteria (randomization, allocation concealment, blinding, dropouts, etc)
- Overall strength of evidence was summarized with GRADE criteria, which consider other factors in addition to risk of bias (consistency, directness, precision, selective reporting of outcomes)

Results:

- A total of 787 patients participated in the included articles: 608 in the radiculopathy group, and 179 in the myelopathy group
 - o 3 studies were randomized; the 6 others had control groups but were not randomized
 - o All 6 of the nonrandomized trials were considered to have a high risk of bias
 - o 2 of the 3 RCTs were also considered to have a high risk of bias
- Poor reporting and a lack of clinically homogeneous studies precluded pooling of data for a meta-analysis
- The one RCT with a low risk of bias compared plasma disc decompression (n=62) with conservative care (n=58)
 - o Plasma disc decompression is a form of percutaneous discectomy which introduces a wand in the nucleus pulposus through a cannula, and is also known as nucleoplasty or Coblation®

- The device uses a radiofrequency-based electrical field to dissolve targeted nuclear tissue resulting in partial ablation of the nucleus
- Patients are discharged 24 hours after the procedure, and are assigned progressive mobilization and analgesics, but no cervical collar
- The conservative care group received an array of nonoperative interventions, depending on the patient's condition and preference; TENS, NSAIDS, postural rehabilitation, and short use of a cervical collar
- The surgical group had greater improvement in pain at 3 months than the control group, and had greater improvement in both pain and function at 12 months
- Two studies with a high risk of bias reported clinically relevant effects of plasma disc decompression
- The authors interpret the results as indicating low quality evidence that plasma disc decompression is more effective than conservative care for neck pain and function
- 3 studies comparing anterior cervical decompression with fusion (ACDF) with conservative care for cervical radiculopathy all had a high risk of bias; there was very low quality evidence of no difference between ACDF and conservative care
- 4 studies comparing ACDF with conservative care for cervical myelopathy were all at high risk of bias; no conclusions could be drawn because of the heterogeneity between the low-quality studies

Authors' conclusions:

- There is low quality evidence that plasma disc decompression is more effective than conservative care for pain and function in cervical radiculopathy
- The methodological quality of most studies was poor, failing to conceal randomization and poorly reporting some pertinent outcome data
- There is insufficient literature to draw a firm conclusion of the effectiveness of surgery compared to conservative care in neck pain patients

Comments:

- The Cesaroni 2010 study on plasma disc decompression may qualify as adequate, but it should be noted that this study excluded patients with extruded or sequestered disc herniation, history of anterior fusion at the treated level, progressive neurological deficit, motor strength in the affected myotome of less than 4/5, and disc height reduction of 50% or greater
- The authors rightly emphasize that the conduct and reporting of clinical trials of neck pain call for improvement, using the CONSORT statement to be followed in the future

Assessment: Adequate for some evidence that plasma disc decompression may result in greater pain relief and functional improvement than conservative care, but in such a narrowly defined population that it has no likely application to a workers' compensation

population, and adequate for a general statement that studies of surgical versus conservative care for cervical radiculopathy and myelopathy have been poorly conducted and reported

Reference:

Cesaroni A, Nardi P. Plasma disc decompression for contained cervical disc herniation: a randomized, controlled trial. *Eur Spine J* (2010) 19:477–486.