

LITERATURE REVIEWS

Summary and Perspective of Recent Literature

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Hebert J, Fritz J, Koppenhaver S, Thackeray A, Kjaer P. (2014). Predictors of clinical outcome following lumbar disc surgery: the value of historical, physical examination, and muscle function variables. *European Spine Journal*.

Objective:

Explore the relationships between preoperative finding and clinical outcome following lumbar disc surgery and investigate the prognostic value of physical examination findings after accounting for information acquired from the clinical history.

Design:

A secondary analysis of a parallel group randomized clinical trial comparing two postoperative rehabilitation protocols following lumbar disc surgeries.

Setting:

Patients were selected from academic and private neurological and orthopaedic spine surgery practices in Salt Lake City, Utah.

Patients:

Inclusion criteria:

- Aged from 18-60 years of age.
- Imaging confirmed lumbar disc herniation.
- Identified as candidates for single-level lumbar discectomy or microdiscectomy by their spine surgeon.

Exclusion criteria:

- Previous lumbar surgery.
- Significant comorbidities or perioperative complications representing a contraindication to exercise.

At postoperative week two, all participants underwent an eight-week exercise programme comprising weekly supervised sessions and daily home exercises. Group 1 had general lumbar exercises and Group 2 had specific lumbar exercises.

At the end of the original study, no difference was found in the specific exercise group vs. general exercises.

Main Outcome Measures:

Change in disability and pain intensity from the preoperative assessment to the completion of the rehabilitation program. Low back pain related disability was assessed using the modified Oswestry Disability Questionnaire.

Main Results:

At the end of the original study, no difference was found in the specific exercise group vs. general exercises. Comparing pre-operative history and physical findings with end-of-rehabilitation findings revealed the following relationships:

Univariate analysis:

- Greater pre-operative leg pain relative to low back pain was associated with more improvement in disability and leg pain intensity, but less improvement in lower back pain intensity.
- Longer time to surgery was associated with more improvement in disability.
- More improvement in leg pain intensity was reported among participants who had received pain medication.
- The presence of preoperative deformity was associated with greater improvement in disability, leg pain intensity, and low back pain intensity.

- Greater improvement in disability was associated with the presence of a positive straight leg raise test, cross straight leg raise test, pain peripheralization, as well as diminished reflexes, sensation or strength prior to surgery.
- Having a positive straight leg raise test or strength deficit was associated with more improvement in leg pain intensity.
- No relationship was found between lumbar multifidus function and clinical outcome.

Multivariate analysis (To account for the variation in the clinical history):

- The presence of pain peripheralization at baseline was associated with greater improvement in both disability and low back pain intensity after ten postoperative weeks.

Conclusion:

The multivariate analyses indicated that the presence of preoperative pain peripheralization was associated with improved disability and low back pain intensity following surgery and exercise rehabilitation. Preoperative lumbar multifidus showed no relationship with clinical outcome following lumbar disc surgery and postoperative rehabilitation. Another predictor of outcome following lumbar disc surgery was the presence of predominant leg pain compared to low back pain.

Comments/ Implications for the MDT clinician:

The authors' preoperative mechanical assessment left a lot to be desired. They assessed the patient's response to sustained extension in prone, and single and repeated repetitions of lumbar extension, flexion and side-gliding while standing, not lying, monitoring only for centralization and peripheralization and not a mechanical response. The assessment and the definitions of centralization and peripheralization were remedial; there was no attention to Directional Preference or an attempt to exhaust the sagittal plane. One wonders how the mechanical assessment would have differed in the hands of trained individuals. However, that being said, 32.7% of the patients demonstrated centralization and 85.5% demonstrated peripheralization.

The authors pointed out that centralization was not associated with outcome following lumbar surgery. If a patient centralizes during a mechanical evaluation, the recommendation would be to pursue therapy, not to go ahead with surgery. The presence of centralization should further be explored because the lesion has demonstrated a possibility that it can be reduced. This is exactly the patient that should not have surgery, and it is no epiphany that a person who was not a good candidate for surgery in the first place, may not have an optimal outcome. So, it is no wonder that centralization did not predict good postsurgical outcome. This study does support that the presence of peripheralization preoperatively is one of the best indicators of a good outcome post-surgically. This result corresponds with what MDT clinicians see in the clinic. The presence of peripheralization is of utmost importance. It guides our decision making, when to change direction, force, or when to refer out. With regards to peripheralization, this study lets us know that one of the foundations that MDT is based upon continues to be solid.

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