

# **Association between peridural scar and persistent low back pain after lumbar discectomy**

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## FROM ABSTRACT:

The purpose of this study was to investigate the correlation between low back pain persisting six months after first surgery for herniated lumbar intervertebral disc and the extent of peridural fibrosis present at the surgical site, as defined by magnetic resonance imaging (MRI).

Clinical assessments were conducted pre-operatively and at 1, 3, and 6-month intervals post-operatively, and included MRI scar assessment and the assessment of low back pain by visual analog scales.

There were 267 patients available for low back pain assessments. The data obtained at the 6-month follow-up visit were statistically analyzed for the association between the presence of peridural scar and the persistence of low back pain.

Patients with extensive scar reported continuing and debilitating low back pain more frequently than those with no or minimal scar.

These findings demonstrate a direct correlation between persistent low back pain and extensive scar, since patients with increased amounts of scar had increased low back pain, regardless of their treatment group.

## THESE AUTHORS ALSO NOTE:

Persistent low back pain may be caused by disc fragments adhering to the dura or "dense fibrosis surrounding the dural sac."

"Several authors have shown a correlation between scar and LBP."

There is a correlation between epidural scar and poor clinical outcome after surgery.

In this study, MRI films were obtained with injection of gadolinium enhancement.

Each MRI slice was divided into 4 spatial quadrants centered on the thecal sac. Based on the quantity of fibrosis, a Scar Score was assigned to each quadrant, as follows:

- 0 No fibrosis or a trace amount of fibrosis.
- 1 Up to 25 % of the quadrant filled with fibrosis.
- 2 25% to 50% of the quadrant filled with fibrosis.
- 3 50% to 75% of the quadrant filled with fibrosis.
- 4 More than 75% of the quadrant filled with fibrosis.

Low back pain (LBP) was assessed using a visual analog pain scale.

“Patients with minimal to moderate scarring showed significant improvement in LBP compared to pre-operative baseline evaluations, whereas patients with extensive scar showed no improvement or worsening of LBP, constituting surgical failure.”

“Patients with more scar had more LBP.”

“Radiological visualization of the spine (by myelogram, discogram, and CT scan) did not always provide clear answers as to the causes of failed back surgery. Frequently, the cause of continued symptomology was discovered only upon re-operation, at which peridural fibrosis arising from the previous surgery was found to be causative in a significant number of cases.”

“Gadolinium-enhanced MRI has been found to be 96% accurate in differentiating scar tissue from disc.”

In this study, the “results demonstrated that increasing amount of scar was predictive of increased LBP.”

“This study clearly demonstrates that patients with increased peridural scarring had worsening surgical outcomes as measured by low back pain.”

Increased scar is not only correlated with increased LBP, “but also other components of failed back surgery syndrome, such as reduced straight leg raising exams, radicular pain, and reduced activities of daily living.”

“This underscores the importance of preventing or minimizing scar formation as a means of improving surgical outcome for patients.”

## KEY POINTS FROM DAN MURPHY

- 1) Persisting low back pain may be caused by adhesions between the disc and the dura or "dense fibrosis surrounding the dural sac."
  - 2) There is a correlation between scar tissue and low back pain.
  - 3) There is a correlation between epidural scar tissue and poor clinical outcome after surgery.
  - 4) Patients with extensive scarring after surgery showed no improvement or worsening of LBP, constituting surgical failure.
  - 5) Scar tissue is not well visualized by x-rays, myelogram, discogram or CT scan.
  - 6) Gadolinium-enhanced MRI is 96% accurate in differentiating scar tissue from disc herniation.
  - 7) On failed back surgery, the cause of continued symptoms is often peridural fibrosis arising from the previous surgery, as discovered only at re-operation.
  - 8) Increased amounts of scar tissue increases low back pain, worsens the surgical outcome, reduces straight leg raising, and increases radicular pain.
  - 9) It is important to prevent or minimize scar formation to improve surgical outcome for patients.
- COMMENTS FROM DAN

In the 5 years that we have been doing these article reviews, we have seen five methods of preventing or reducing scar formation:

- 1) Reduce inflammation. The resolution of inflammation is fibrosis. We have seen many studies relating inflammation to prostaglandin E2. We reduce prostaglandin E2 by reducing omega-6 fatty acids (primarily by avoiding trans fats / hydrogenated oils) and supplementing with omega-3 fish oils.
- 2) Ice.
- 3) Early, persistent, controlled motion. In the epidural spaces the motion is best accomplished with "mobilization of the nervous system," a controlled stretching procedure of the nerve roots using the extremities.
- 4) Using low-level laser therapy.
- 5) Established fibrosis can be reduced or remodeled to less adverseness with specific line-of-drive spinal adjusting.