Recurrent lumbar disc herniation

Definition

The strict definition of recurrent lumbar disc herniation is the presence of herniated disc material at the same level, ipsi- or contralateral, in a patient who has experienced a pain-free interval of at least 6 months since surgery. The clinically more appropriate definition, however, is disc herniation at the previously operative site and side. The pain-free interval should not be restricted to the minimum of 6 months. It has been suggested that the mean interval for recurrent pain associated with recurrent herniated discs is 18 months, longer than that for de novo herniated discs or symptomatic epidural fibrosis.

It has been suggested that the mean interval for recurrent pain associated with recurrent herniated discs is 18 months, longer than that for de novo herniated discs or symptomatic epidural fibrosis.

Epidemiology

Although the recurrence of lumbar disc herniation (LDH) requiring reoperation remains a controversial question in spinal surgery, the incidence is reported to linger around 5-15% according to several previous studies.

Risk factors

see Recurrent Lumbar Disc Herniation Risk Factors.

Clinical features

A recurrent lumbar disc herniation (RLDH) is the most prevalent cause for new radicular pain after surgery for disc herniation-induced sciatica.

Differential diagnosis

Normal postdiscectomy appearances can be mistaken for recurrent or retained disc. In the early (0 to 6-month) postoperative period, MR imaging reveals an interspace high signal intensity band extending from the nucleus pulposus to the site of anular disruption (especially noticeable at 0-2 months). The anulus is typically hyperintense and the nucleus hypointense. There is loss of disc space height. The endplates and marrow can exhibit changes as well, often low signal on T1-weighted and high signal on T2-weighted images suggesting inflammation and edema. The anterior epidural space initially reveals an increase in soft-tissue mass, evidence of tissue disruption, edema, and hemorrhage, with the appearance of mass effect.

Nerve root enhancement with Gd is normal, reflecting breakdown of the blood-nerve barrier, but
should resolve by 6 months. Adhesions within the thecal sac at the operative level usually resolve within several weeks. Postoperative changes at the laminectomy site depend on the extent of surgery, ligamentum flavum removal, and whether fat graft was placed in the epidural space. Facet joint enhancement occurs as a local response to dissection and persists long (≥6 months) after surgery in more than half of the patients in whom imaging is performed 9,10,11.

### Diagnosis

Persistent/recurrent disc herniation. 48-Year-old female who underwent laminectomy and L5-S1 discectomy. Follow-up MRI was performed 20 days after surgery due to persistent lumbar pain radiating to the left lower extremity. The axial T2-weighted image (A) shows persistent-recurrent left parasagittal DH connected to the left S1 nerve root at the lateral recess level (arrow). Unenhanced and contrast-enhanced axial T1-weighted image (B and C) shows peripheral enhancement of the herniated material.

![Persistent/recurrent disc herniation](http://www.elsevier.es/imatges/419/419v55n01/grande/419v55n01-90195107fig12.jpg)

### Treatment

There is widespread variation regarding optimal surgical management for recurrent herniation, which often include revision discectomies with or without fusion via open and minimally invasive techniques 12.

While repeat discectomy is often successful in treating these patients, concern over repeat RLDH may lead surgeons to advocate instrumented fusion even in the absence of instability.

Surgical choices for disc recurrent herniations are limited by multiple factors, require longer operative time, and are associated with higher rate of complications, treatment seems to be associated with a similar chance of good outcome.

Currently, there aren't any guidelines to assist surgeons in determining which approach is most appropriate to treat rDH. A recent survey showed significant heterogeneity among surgeons regarding treatment options for rDH. It remains unclear which methods lead to better outcomes, as there are no comparative studies with a sufficient level of evidence.

In a study Drazin et al aimed to perform a systematic review to compare treatment options for rDH
and determine if one intervention provides better outcomes than the other; more specifically, whether outcome differences exist between discectomy alone and discectomy with fusion.

They applied the PICOS (participants, intervention, comparison, outcome, study design) format to develop this systematic review through PubMed. Twenty-seven papers from 1978-2014 met our inclusion criteria and were included in the analysis. Nine papers reported outcomes after discectomy and seven of them showed good or excellent outcomes (70.60%-89%). Ten papers reported on minimally invasive discectomy. The percent change in visual analog scale (VAS) ranged from -50.77% to -86.57%, indicating an overall pain reduction. Four studies out of the ten reported good or excellent outcomes (81% to 90.2%). Three studies looked at posterolateral fusion. Three studies analyzed posterior lumbar interbody fusion. For one study, we found the VAS percentage change to be -46.02%. All reported good to excellent outcomes. Six studies evaluated the transforaminal lumbar interbody fusion. All reported improvement in pain. Four used VAS, and we found the percent change to be -54% to -86.5%. The other two used the Japanese Orthopedic Association (JOA) score, and we found the percent change to be 68.3% to 93.3%. We did not find enough evidence to support any significant difference in outcomes between discectomy alone and discectomy with fusion. The limitation of the study includes the lack of standardized outcomes reporting in the literature. However, reviewing the selected articles shows that fusion may have a greater improvement in pain compared to reoperation without fusion. Nonetheless, the study shows that further and more in-depth investigation is needed on the treatment of rDH.

Outcome

see Recurrent Lumbar Disc Herniation Outcome.

Case series

2017

Guan et al., used the National Neurosurgery Quality and Outcomes Database (N2QOD) to assess outcomes of patients who underwent repeat discectomy versus instrumented fusion at a single institution from 2012 to 2015. Primary outcomes included Oswestry Disability Index (ODI) score, visual analog scale (VAS) score, and quality-adjusted life year (QALY) measures. Secondary outcomes included hospital length of stay, discharge status, and hospital charges.

The authors identified 25 repeat discectomy and 12 instrumented fusion patients with 3- and 12-month follow-up records. The groups had similar ODI and VAS scores and QALY measurements at 3 and 12 months. Patients in the instrumented fusion group had significantly longer hospitalizations (3.7 days vs 1.0 days, p < 0.001) and operative times (229.6 minutes vs 82.7 minutes, p < 0.001). They were also more likely to be female (p = 0.020) and to be discharged to inpatient rehabilitation instead of home (p = 0.036). Hospital charges for the instrumented fusion group were also significantly higher ($54,458.29 vs $11,567.05, p < 0.001). Rates of reoperation were higher in the repeat discectomy group (12% vs 0%), but the difference was not statistically significant (p = 0.211).

Repeat discectomy and instrumented fusion result in similar clinical outcomes at short-term follow-up. Patients undergoing repeat discectomy had significantly shorter operative times and length of stay, and they incurred dramatically lower hospital charges. They were also less likely to require acute rehabilitation postoperatively. Further research is needed to compare these two management.
A total of 163 patients who underwent Microendoscopic diskectomy (MED) for LDH and could be followed for a minimum of 1 year after surgery were enrolled in this study (follow-up [FU] rate: 79.9%).

Ikuta et al., investigated the characteristics of LDH recurrence and conducted a comparative study between the patient groups with and without recurrence to identify the risk factors for the recurrence.

The recurrence of LDH was observed in 19 patients (11.7%) during a mean of 38 months FU. Although the mean length of time from MED to recurrence was 19.2 months, 36.8% of the LDH recurrence occurred in the first 3 months following MED. Eleven patients were treated successfully by conservative treatments, and the remaining eight patients had to undergo revision surgery (MED in five patients, microdiskectomy in one, and instrumented fusion in two). In the analysis of risk factors for the recurrence, the presence of diabetes mellitus (DM) was significantly correlated with the recurrence (p = 0.0027).

The recurrence rate following MED for LDH was equivalent to those of previous reports of conventional and microscopic diskectomy. However, a third of the LDH recurrences occurred in the first 3 months after MED. We should pay attention to LDH recurrence at an early phase following MED and recognize the presence of DM as a risk factor for LDH recurrence.

A study included 344 patients who underwent MED (213 males and 131 females; mean age, 39.3 years; age range, 11-82 years; mean follow-up, 3.6 years; follow-up range, 2.0-6.5 years). The clinical outcomes were evaluated using the Japanese Orthopedic Association Score for Low Back Pain (JOA score). Recurrence factors investigated by logistic regression analysis included age; sex; level, laterality, and classified type of LDH; occupation; sports activity; and learning curve of the surgeon.

LDH recurrence was observed in 37 patients (10.8%). It was observed at the same level in the ipsilateral side as the original LDH in 30 patients, in the contralateral side in three patients, and at a level adjacent to the original level in four patients. The mean time interval between MED and the recurrence was 16.6 months (range, 0.5-52 months). Twenty patients (54.1%) developed recurrence within 1 year after MED. Twenty-two patients (59.5%) were treated by revision surgery (MED in 20 patients and microdiscectomy in two patients), and 15 patients (40.5%) were treated conservatively.

The mean JOA score of all the patients was 14.7 ± 3.5 before surgery and 26.5 ± 2.2 at the final follow-up, yielding an average recovery rate of 82.3 ± 15.7%. The recovery rate was 83.1 ± 14.8% in patients without recurrence and 75.7 ± 20.4% in patients with recurrence (p = 0.006). By logistic regression analysis, we identified migration of LDH as a significant factor related to recurrence. The patients with caudal migration of LDH had recurrence more frequently (19.0%) than those with rostral migration (12.5%) or without migration (10.2%) (p = 0.04; odds ratio, 2.0; 95% confidence interval, 1.0-3.8).

The recurrence rate and reoperation rate for LDH after MED were comparable to those of conventional discectomy. More than half of the cases of recurrence occurred at an early postoperative phase, and
patients with caudally migrated LDH experienced recurrence significantly more often than those with rostrally migrated or nonmigrated LDH.  
