



Original Article

Analysis of risk factors and postoperative predictors for recurrent lumbar disc herniation

M. Dobran, Davide Nasi, R. Paracino, M. Gladi, M. Della Costanza, A. Marini, S. Lattanzi, M. Iacoangeli

Department of Neurosurgery, Umberto I General Hospital, Università Politecnica delle Marche, Ancona, Italy.

E-mail: M. Dobran - dobran@libero.it; *Davide Nasi - davidenasi83@gmail.com; R. Paracino - r.paracino@gmail.com; M. Gladi - mauriziogladi@gmail.com; M. Della Costanza - martina.dellacostanza@gmail.com; A. Marini - marini.alessandra.am@tiscali.it; S. Lattanzi - alfierelattanzisimona@gmail.com; M. Iacoangeli - neurotra@gmail.com



***Corresponding author:**

Davide Nasi,
Department of Neurosurgery,
Università Politecnica delle
Marche - Ospedali Riuniti, Via
Conca #71, Ancona - 60020,
Italy.

davidenasi83@gmail.com

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ABSTRACT

Background: This study identified risk factors and postoperative indicators for recurrent lumbar disc herniations (rLDH) following microdiscectomy.

Methods: We retrospectively reviewed the 1-year recurrence rate for LDH in 209 consecutive patients undergoing microdiscectomy (2013–2018).

Results: Utilizing a multivariate analysis, higher body mass index (BMI) and postsurgery Oswestry disability index (ODI) were significantly associated with an increased risk of rLDH.

Conclusions: Elevated postsurgery ODI and higher BMI were significantly associated with increased risk of rLDH.

Keywords: Discectomy, lumbar disc herniation, lumbar microdiscectomy, recurrent disc herniation

INTRODUCTION

Lumbar disc herniation (LDH) is the most common reason for performing lumbar spine surgery. Today, many are managed utilizing a microdiscectomy approach. Nevertheless, these procedures correlate with a recurrence rate at 1 year that ranges from 1% to 21%.^[1,3,5] Here, we looked at potential risk factors that may contribute to recurrent LDH (rLDH) following microdiscectomy.

MATERIALS AND METHODS

We retrospectively reviewed consecutive patients who underwent standard lumbar spinal microdiscectomy for disc herniation (LDH) (2013–2018). The follow-up evaluations were performed at 1, 6, and 12 months postoperatively. Recurrence of disc herniation was defined as disc herniation at the same level and side of the previous microdiscectomy after a 3-month postoperative pain-free

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Table 1: Characteristics of patients according to 1-year outcome; relapse: $n=20$ (9.6%).

| Variable | Full cohort ($n=209$) | No relapse ($n=189$) | Relapse ($n=20$) | P |
|--------------------------|-------------------------|------------------------|--------------------|--------------------|
| Age (years) | 44.6 (11.8) | 43.9 (11.7) | 50.4 (12.0) | 0.021 ^a |
| Male sex | 125 (59.8) | 115 (60.9) | 10 (50.0) | 0.347 ^b |
| BMI (kg/m ²) | 27 (24–20) | 27 (24–28) | 29 (27.5–30.5) | 0.005 ^c |
| Smoking | 144 (68.9) | 129 (68.3) | 15 (75.0) | 0.535 ^b |
| VAS | 2.6 (1.5) | 2.5 (1.5) | 3.2 (1.7) | 0.076 ^a |
| ODI | 15 (10–20) | 15 (5–20) | 20 (15–22) | 0.002 ^c |
| Disc hernia level | - | - | 3 (8.6) | 0.973 ^b |
| L3–L4 | 35 (16.8) | 32 (91.4) | 10 (9.6) | - |
| L4–L5 | 104 (49.8) | 94 (90.4) | 7 (10.0) | - |
| L5–S1 | 70 (33.5) | 63 (90.0) | - | - |

Data are mean (SD) or median (IQR) for continuous variables and n (%) for categorical variables. ^aTwo-sample t -test. ^bChi-squared test. ^cMann–Whitney U -test. ODI: Oswestry disability index; VAS: Visual analog scale, BMI: Body mass index, SD: Standard deviation

period. Variables contributing to rLDH included age, sex, weight/body mass index (BMI), smoking status, postoperative (6 months) Oswestry disability index (ODI), and the level of the disc herniation. Radiological examination included magnetic resonance imaging before and after surgery.

Statistical analysis

Analyses include Student's t -test, Mann–Whitney U -test or Chi-squared test, logistic regression, and multivariate analysis. Results were considered significant for $P < 0.05$ (two-sided). Data analysis was performed using STATA/IC 13.1 statistical package (StataCorp LP, Texas, USA).

RESULTS

There were 209 patients included in this study; 20 of 209 (9.6%) had rLDH at 1 postoperative year. Utilizing a multivariate analysis, older age, higher BMI, and postsurgery ODI were significantly associated with increased risk of rLDH [Tables 1 and 2].

DISCUSSION

Microdiscectomy is a relatively straightforward procedure but is associated with a complication rate of up to 15–18%.^[1–6] rLDH is the most frequent complication, occurring from 5% to 15% of the time.^[6] rLDH is defined as a disc hernia at the same level of a previous microdiscectomy in patient with a pain-free interval of at least 3 months long after surgery.^[1–6] In patients treated with microdiscectomy, it is important to avoid a second surgery due to the attendant increased risks/complications associated with repeated decompression versus decompression/fusion.^[5,6] In our study, BMI was an independent predictor of recurrence both at unadjusted logistic regression analysis ($P = 0.004$) and adjusted analysis ($P = 0.024$). In our series, postoperative 6-month ODI score value correlated with rLDH. Furthermore, in this study, older age was a predictor of recurrence.^[1–6]

Table 2: Prediction of 1-year LDH.

| Independent variable | Unadjusted | | Adjusted* | |
|----------------------|------------------|-------|------------------|-------|
| | OR (95% CI) | P | OR (95% CI) | P |
| Age | 1.05 (1.01–1.09) | 0.023 | 1.04 (1.00–1.09) | 0.060 |
| Sex | 0.64 (0.26–1.62) | 0.350 | 0.50 (0.18–1.38) | 0.178 |
| BMI | 1.28 (1.08–1.51) | 0.004 | 1.23 (1.03–1.46) | 0.022 |
| Smoking | 1.40 (0.48–4.02) | 0.537 | 0.98 (0.30–3.13) | 0.968 |
| ODI | 1.10 (1.03–1.17) | 0.005 | 1.09 (1.02–1.18) | 0.017 |
| Disc hernia level | 1.08 (0.55–2.12) | 0.824 | 0.88 (0.41–1.88) | 0.740 |

ORs for every 1 year and 1-point BMI or ODI increases are obtained with logistic regression analysis. BMI: Body mass index; CI: Confidence interval; ODI: Oswestry disability index; OR: Odds ratio, LDH: Lumbar disc herniation

CONCLUSIONS

To summarize, patients with rLDH were older and had higher BMI and postsurgery ODI score after a pain-free 3-month interval.

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Conflicts of interest

There are no conflicts of interest.

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