



CHARACTERIZATION AND RISK FACTOR ANALYSIS FOR REOPERATION AFTER MICROENDOSCOPIC DISCECTOMY

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1 BACKGROUND

2 OBJECTIVES

3 METHODS

4 RESULTS

5 CONCLUSIONS

BACKGROUND

- Micro- and minimal- discectomy:
  - Chemonucleolysis
  - Manual, automated, and laser percutaneous discectomy
  - Microendoscopic discectomy (MED)
- MED had lasting benefits in numerous cases [1]

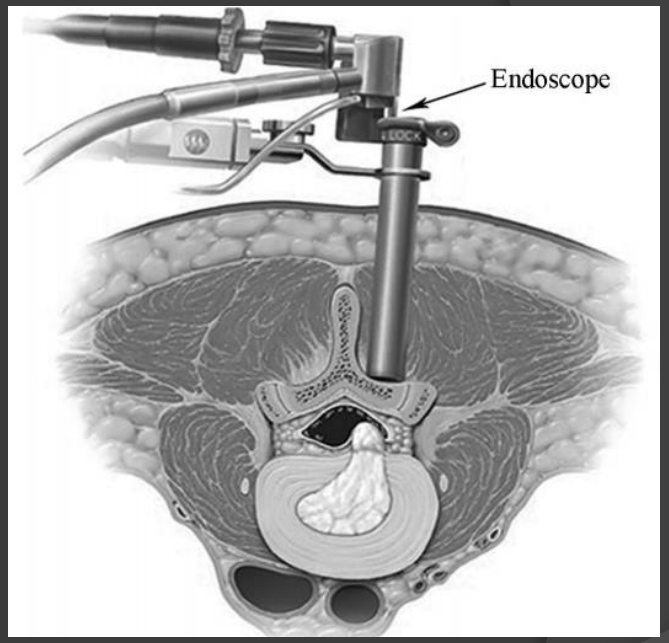


Figure 1 illustration of MED [1]

1. Wu, X., et al., *Microendoscopic discectomy for lumbar disc herniation: surgical technique and outcome in 873 consecutive cases.* Spine, 2006. **31**(23): p. 2689-2694.

BACKGROUND

- Defects:
  - Reoperation rate（2.5%-12.7%）[1-2]
- Lack of research:
  - Risk factors of reoperation after MED are not confirmed

1. Wu, X., et al., *Microendoscopic discectomy for lumbar disc herniation: surgical technique and outcome in 873 consecutive cases.* Spine, 2006. **31**(23): p. 2689-2694.
2. Casal-Moro, R., et al., *Long-term outcome after microendoscopic diskectomy for lumbar disk herniation: a prospective clinical study with a 5-year follow-up.* Neurosurgery, 2011. **68**(6): p. 1568-1575.

OBJECTIVES

Characteristics of reoperation after MED;

Risk factors



Patient selection

METHODS: patients

- Initial including：
  - January 2005 — December 2010
  - A consecutive cohort of 1,263 patients
  - Primary & Single-level MED

METHODS: surgical technique

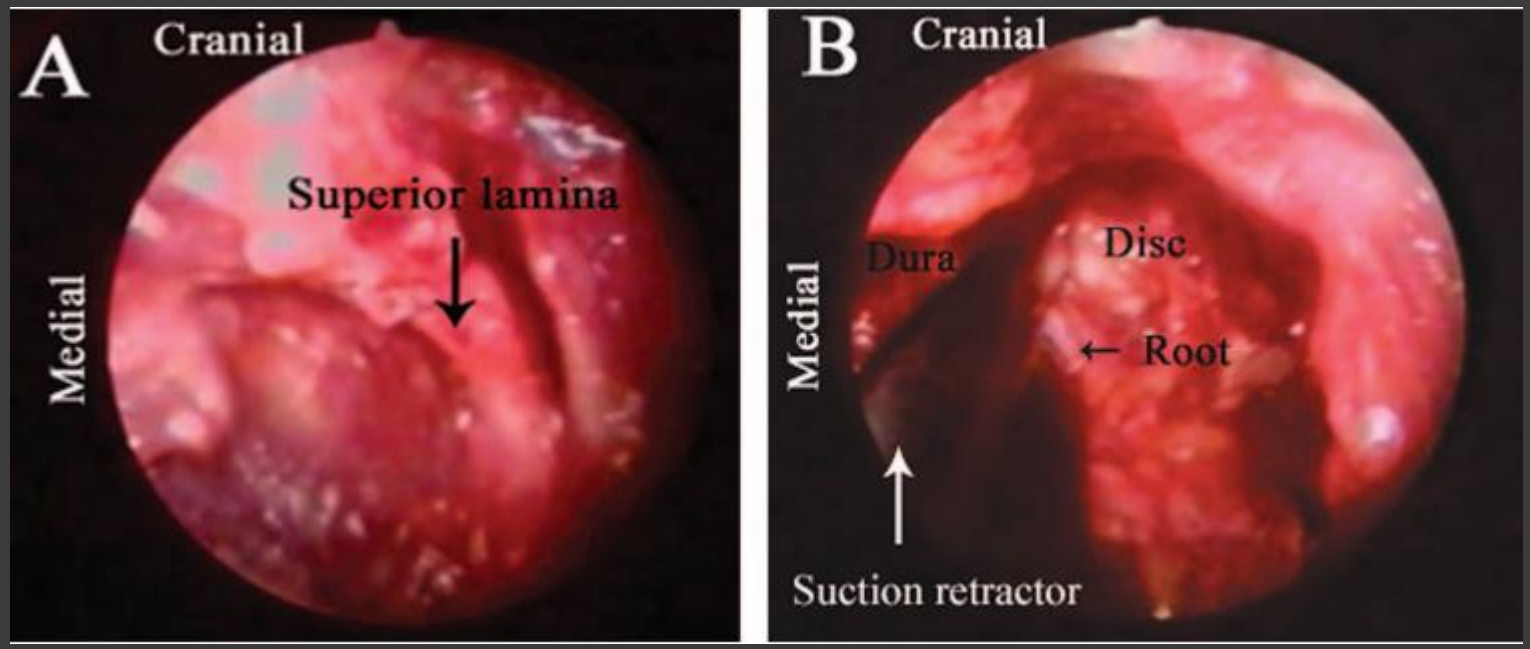


Figure 2 Screen view of MED during operating (**A**) Superior lamina was at 12 o'clock. (**B**) Nerve root was retracted medially by suction retractor to expose herniated disc.

METHODS: patients

- Exclusion criteria:
  - 1) Died before the follow-up time point
  - 2) Follow-up can’t complete
  - 3) Clinical data missed.
- Final participants: (n=952)
  - Single operation group (n=894)
  - Reoperation group (n=58)

METHODS: outcome measures

- Clinical characteristics:
  - age, sex, occupation, weight, smoking history, duration of symptom, duration of surgery, blood loss
- Preoperative imaging features:
  - level, laterality, type of LDH, and degenerative changes at or adjacent to the operative level

METHODS: outcome measures

- Causes for reoperation:
  - recurrent herniations, epidural scar or adhesive arachnoiditis, lumbar instability and other causes
- Intervals between the primary and revision operations (month)
- Revision surgery methods:
  - Open discectomy or secondary MED,
  - Open discectomy plus interspinous dynamic stabilization device implantation,
  - Posterior lumbar interbody fusion (PLIF)
  - Transforaminal lumbar interbody fusion (TLIF)

METHODS: statistical analysis

- Single factor comparison:
  - reoperation and non-reoperation group
  - unpaired student t-test, chi-square test or non-parametric Kruskal-Wallis test
- Stepwise multivariate log-binomial analysis:
  - Included confounders ($p<0.15$)
- Kaplan-Meier estimate
  - cumulative proportion of reoperation rates

RESULTS: Single factor comparison

Table 1: Sociodemographic and clinical characteristics of the patients at the time of their primary operation for LDH (only variables with significant difference were listed)

	Single operated (n=894)	Reoperated (n=58)	P value
Age (year)	40.58±12.03	44.71±11.33	0.011*
Disc degeneration (Pfirrmann grading system)			
Grade **3**	52(5.8%)	0(0%)	
Grade 4	235(26.3%)	8(13.8%)	
Grade 5	376(42.1%)	24(41.4%)	0.002*
Grade 6	213(23.8%)	22(37.9%)	
Grade 7	18(2.0%)	4(6.9%)	
Modic change(%)			
Grade 0	597(66.9%)	26(44.8%)	
Grade Ⅰ	13(1.5%)	10(17.2%)	0.000*
Grade Ⅱ	273(30.6%)	20(34.5%)	
Grade Ⅲ	10(1.1%)	2(3.4%)	
Adjacent disc degeneration(%)			
Grade **0**	464(51.9%)	11(19.0%)	
Grade **1**	393(44.0%)	40(69.0%)	0.000*
Grade **2**	37(4.1%)	7(12.1%)	

RESULTS: Single factor comparison

- Facet joint degeneration (p=0.064)
  - 35.2% in non-reoperation group VS 50% in reoperation group
- No significance:
  - sex, duration of symptom, level, laterality and type of LDH, duration of surgery, blood loss

RESULTS：Logistic regression analysis

- Involved variables (P<0.15):
  - Age
  - Duration of symptom
  - Level of LDH
  - Pfirrmann grading
  - Modic change
  - Adjacent segment degeneration
  - Facet joint degeneration

RESULTS： Logistic regression analysis

Table 2: Significant risk factors for reoperation after multivariate log-binomial analysis

	Coefficient	Standard Error	P value	Odds Ratio(95% CI)
Pfirrmann Grading	0.411	0.175	0.019	1.510(1.071-2.125
Adjacent disc degeneration	0.895	0.237	0.000	2.448(1.537-3.898

RESULTS: Characterization of reoperation

Table 3: Clinical parameters of reoperated patients

		n	Percent(%)
Causes			
	Recurrent disc herniation or epidural scar	32	55.17%
	Spondylolisthesis	3	5.17%
	Lumbar stenosis	4	6.90%
	Lumbar instability with/without disc herniation	17	29.31%
	Others	2	3.45%
Interval between primary and revision sugeries			
	< 1 year	14	24.14%
	1 -5 year	31	53.45%
	> 5 years	13	22.41%
Surgical method for reoperation			
	Secondary discectomy(Open discectomy/MED)	10	17.24%
	Open discectomy plus IPD implantation	2	3.45%

RESULTS: Cumulative reoperation rate

- Kaplan-Meier analysis
- Cumulative overall reoperation rate:
  - 1 year: 1.56%
  - 3 year: 2.74%
  - 5 year: 5.23%
  - 10 year: 8.17%。

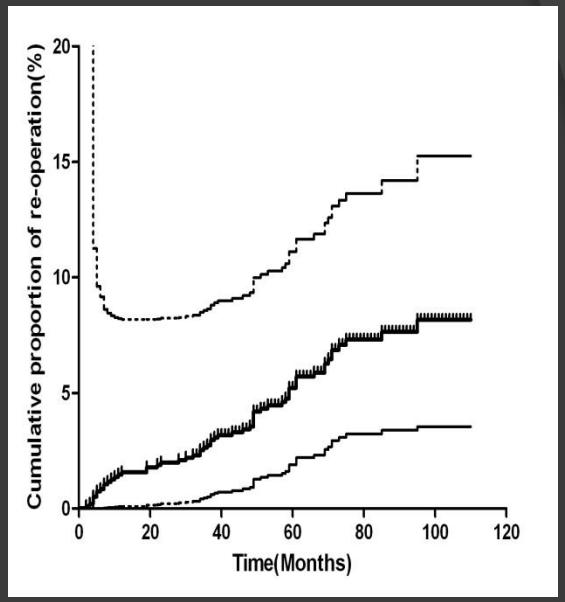


Figure 3. Cumulative proportion of re-operations for lumbar disc herniation after first MED (dotted line shows 95% confidence interval)

SUMMARY and CONCLUSIONS

- MED reoperation:
  - Low incidence
  - Older age
  - Higher grade of lumbar degeneration
  - More Modic changes
  - Higher rate of adjacent disc degeneration
- Risk factors of reoperation:
  - Adjacent disc degeneration
  - Pfirrmann grading for operated disc
- Contribute to surgical decision making for surgeons and patients


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Thank You !