

# Nerve Root Retraction Time During Lumbar Endoscopic Discectomy Surgery: Association with Post-Operative Neurological Complications

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# Disclosures

<b>MGC</b>	<b>Company/Institution</b>	<b>Role</b>
	Cervical Spine Research Society	Board
	Nexus Spine	Consultancy
	SurgAlign Technologies	Consultancy, Product Development/Royalties
	Integrity Spine	Product Design/Royalties
<b>ZB</b>	<b>Company/Institution</b>	<b>Role</b>
	Cerapedics (past)	Consultancy
	SeaSpine (past)	Research Support: paid to the institution
	Next Science (past)	Research Support: paid to the institution
	Medical Metrics (past)	Research Support: paid to the institution
	NIH SBIR Subaward (past)	Grant: paid to the institution
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	MiMedx	Research Support: paid to the institution
	North American Spine Society	Committee member
	Lumbar Spine Society	Co-chair Educational Committee
	AOSpine	Knowledge Forum Degenerative: Associate member; AOSNA Research committee- committee member

# Introduction

- Lumbar disc herniations are one of the most common spinal pathologies leading to low back pain and radiculopathy.
- Endoscopic discectomies reduce tissue retraction and incision size, however the procedures require scope placement within the foramen and substantial nerve root retraction.
- Nerve root retraction time has been associated with the changes in neurological outcomes in other lumbar surgeries

**Study Aim:** To evaluate the relationship between nerve root retraction time, post-operative radiculitis and patient reported outcomes (PROs).

# Materials and Methods

- Retrospective analysis of prospectively collected data of patients who underwent single or multi-level lumbar discectomy between 2020 and 2022
- Endoscopic lumbar discectomy with either an extraforaminal or a sublaminar approach.
- Demographics, intra-operative variables (type of discectomy, side, levels, surgery time, nerve retraction time, intra-op complications, estimated blood loss, length of stay), post-operative complications and PROS (VAS leg, ODI and CAT) were recorded.
- Statistical analysis included paired t-test and logistic regression

# Results

Demographics		Endoscopic Discectomy (n=157)
		n (%)
Age (AVG±STD) in years		44±10
Gender		
Male		100 (63.7%)
Female		57 (36.3%)
Smoker		
Yes (everyday)		31 (19.7%)
Yes (sometimes)		10 (6.4%)
Former Smoker		0
No		116 (73.9%)
ASA Grade		
I		1 (0.6%)
II		149 (94.9%)
III		7 (4.5%)
Side		
Left		48 (26.8%)
Right		50 (27.9%)
Bilateral		81 (45.3%)
Approach		
EF		106 (58.2%)
IL		66 (36.3%)
SL		10 (5.5%)
TL		0
EBL (average in cc)		7.05
Surgery Time (average in min)		29.4

Definition of new onset radiculitis:

- ❖ Pain that radiates down the leg in a new anatomical location not previously reported.

New onset of radiculitis at 2 weeks post-op (n=133 patients):

- 24 patients reported new onset (18%)
- 109 patients did not have radiculitis (82%)

# Results

- In patients with radiculitis who had worse VAS leg outcomes at two weeks (4.2 vs 8.3,  $p < 0.001$ ) average nerve retraction time was  $13.8 \pm 7.5$  min
  - In this population at up to 3 months and 6 months VAS leg remained higher than the baseline
- In patients with radiculitis who had improved VAS leg outcomes at two weeks (9.3 vs 7,  $p = 0.1181$ ) average nerve retraction time was  $6.7 \pm 1.2$  min
- At 6 months in patients with longer nerve retraction time there was no significant improvement in the ODI score (0.52 vs 0.46,  $p = 0.306$ )
- Similar trends were observed for CAT domains for Pain interference, Pain intensity and Physical function

# Discussion

- This is the largest study to our knowledge that has looked at the nerve root retraction time as a risk factor for neurological complications in endoscopic discectomy.
- Patients with radiculitis who had had longer nerve retraction time had worse VAS leg pain at 2 weeks than patients with shorter nerve retraction time.
- Furthermore, in patients with longer retraction time the post-operative VAS score remained increased at later time points.
- Similarly, no significant change was seen in ODI or CAT domains in those patients.

Thank you