EFFECTIVENESS OF ENDOSCOPIC AND MICROSCOPIC TECHNIQUES IN THE TREATMENT OF LUMBAR DISC HERNIATION: A LITERATURE REVIEW

Okilkhon Shukhratmizra ugli Alikhonov
Neurosurgeon, Namangan Regional Multidisciplinary Medical Center
https://orcid.org/0009-0002-2829-2183
Abdurakhmon Ubaydullaevich Norov
Professor, DSc, Republican Specialized Scientific and Practical Medical Center of Neurosurgery
https://orcid.org/0000-0003-4956-9567
Shavkatbek Kholiqov
Associate Professor, PhD, Department of Medical Biology and Histology, Andijan State Medical Institute
https://orcid.org/0009-0003-9502-5453

Relevance of the Topic. Lumbar disc herniation remains one of the most common spinal disorders, leading to neurological deficits, chronic pain, and reduced work capacity. Although conventional open and microscopic discectomy are effective, they are limited by significant tissue damage, severe postoperative pain, and prolonged rehabilitation.

In recent years, minimally invasive approaches such as endoscopic interlaminar and transforaminal discectomy have been increasingly adopted. Ruetten et al. (2008) demonstrated that endoscopic techniques reduce tissue trauma and facilitate faster recovery compared to microscopic discectomy. Ahn (2019) confirmed their effectiveness, especially in L5–S1 herniations. Kim et al. (2018) introduced a novel modification of transforaminal endoscopic discectomy, achieving favorable outcomes even in complex cases.

Righesso (2007) and Yeung (2002) highlighted key advantages of endoscopic approaches, including lower blood loss, reduced postoperative pain, and shorter recovery time. However, Teli (2010) emphasized potential risks such as recurrent herniation and dural tears. Systematic reviews and meta-analyses (Cong 2016; Kim 2018; Chen 2018) suggest that while endoscopic discectomy improves short-term pain relief and recovery, microscopic discectomy may provide superior long-term outcomes in selected patients.

Conclusion. The literature review confirms that endoscopic discectomy is an effective, safe, and minimally invasive technique. Its main advantages include reduced tissue damage, decreased postoperative pain, and faster rehabilitation.

Nevertheless, surgeon expertise, patient selection, and anatomical variations remain crucial determinants of success. Emerging techniques—such as the Suprapedicular Circumferential Opening Technique, endoscopic TLIF, and interlaminar modifications—are expanding the possibilities for managing complex herniations and spinal stenosis.

References

1. Ruetten S., Komp M., Merk H., Godolias G. Full-endoscopic interlaminar and transforaminal lumbar discectomy versus conventional microsurgical technique: a prospective, randomized, controlled study. Spine (Phila Pa 1976). 2008;33(9):931-939.

2. Ahn Y. Endoscopic spine discectomy: indications and outcomes. Int Orthop. 2019;43(4):909-916.

3. Kim H.S., et al. Suprapedicular Circumferential Opening Technique of Percutaneous Endoscopic Transforaminal Lumbar Discectomy for High Grade Inferiorly Migrated Lumbar Disc Herniation. Biomed Res Int. 2018;2018:5349680.

4. Yeung A.T., Tsou P.M. Posterolateral endoscopic excision for lumbar disc herniation: Surgical technique, outcome, and complications in 307 consecutive cases. Spine (Phila Pa 1976). 2002;27(7):722-731.

5. Righesso O., Falavigna A., Avanzi O. Comparison of open discectomy with microendoscopic discectomy in lumbar disc herniations: results of a randomized controlled trial. Neurosurgery. 2007;61(3):545-549.

6. Teli M., et al. Higher risk of dural tears and recurrent herniation with lumbar micro-endoscopic discectomy. Eur Spine J. 2010;19(3):443-450.

7. Cong L., Zhu Y., Tu G. A meta-analysis of endoscopic discectomy versus open discectomy for symptomatic lumbar disk herniation. Eur Spine J. 2016;25(1):134-143.

8. Gibson J.N., Waddell G. Surgical interventions for lumbar disc prolapse: updated Cochrane Review. Spine (Phila Pa 1976). 2007;32(16):1735-1747.