

## Original Research Article

# Endoscopic lumbar decompression: a single-centre 40-case retrospective series

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## ABSTRACT

**Background:** Endoscopic lumbar decompression is a minimally invasive technique with advantages of reduced blood loss, shorter hospital stays and early mobilisation compared to conventional open procedures. This study reports outcomes of 40 patients who underwent lumbar endoscopic decompression at a single tertiary care center.

**Methods:** Retrospective review of 40 consecutive patients with lumbar disc herniation or spinal stenosis who underwent endoscopic decompression. Clinical outcomes were measured using Visual Analogue Scale (VAS) and Oswestry Disability Index (ODI) pre-operatively and at final follow-up. Operative time, blood loss, hospital stay and complications were recorded.

**Results:** The mean age was 52 years (range 30–72), with 24 males and 16 females. The most common level was L4–L5 (60%). Mean VAS for leg pain improved from 8.1 to 2.1 ( $p < 0.001$ ) and ODI improved from 62% to 18% ( $p < 0.001$ ). Complications included 2 dural tears and 1 superficial wound infection. No revision surgeries were required. Mean hospital stay was 1.8 days.

**Conclusions:** Endoscopic lumbar decompression is a safe and effective technique for carefully selected patients, providing excellent pain relief, functional recovery and reduced morbidity.

**Keywords:** Disc herniation, Endoscopic decompression, Lumbar stenosis, Minimally invasive, ODI, VAS

## INTRODUCTION

Lumbar degenerative pathology is a major cause of morbidity worldwide. Traditional open decompression, although effective, is associated with significant muscle dissection, blood loss and prolonged recovery. The foundational work of Yeung in developing percutaneous spinal endoscopy marked a revolution in lumbar surgery.<sup>1</sup> Advancements have allowed the technique to address challenging pathologies, such as highly migrated intracanal disc herniations, through refined approaches like the foraminoplasty technique.<sup>2</sup> Several studies have reported favorable results with endoscopic decompression for lumbar disc herniation and stenosis.<sup>3-6</sup> However, there is limited literature from single-center Indian experiences with larger cohorts. This study aims to evaluate outcomes of 40 patients who underwent endoscopic lumbar decompression at a tertiary care hospital.

## METHODS

### Study design

This was a retrospective case series.

### Study place

The study was conducted at the Department of Orthopaedics, FH Medical College and Hospital, Agra, Uttar Pradesh, India.

### Ethical approval

Ethical approval was obtained from the Institutional Ethics Committee of FH Medical College and Hospital (FHMC/IEC/R.Cell/2023/042).

**Patients**

40 consecutive patients underwent lumbar endoscopic decompression between 2023–2025. Inclusion criteria included single-level lumbar disc herniation or lumbar canal stenosis refractory to conservative management. Exclusion criteria were multilevel pathology, instability, infection or malignancy.

**Procedure**

All patients underwent full-endoscopic decompression using either transforaminal or interlaminar approaches depending on pathology and level. Procedures were performed under general or regional anaesthesia. Operative parameters recorded included operative time, blood loss and hospital stay.

**Clinical assessment**

Visual Analogue Scale (VAS) for leg pain and Oswestry Disability Index (ODI) were recorded preoperatively, immediately postoperatively and at 3 months and 1 year follow-up. Complications and return-to-work time were documented.

**Statistical analysis**

Paired t-test was used to compare pre- and post-operative outcomes with  $p < 0.05$  as significant.

**RESULTS**

Demographic and operative details are presented in Table 1 and Table 2.

**Complications**

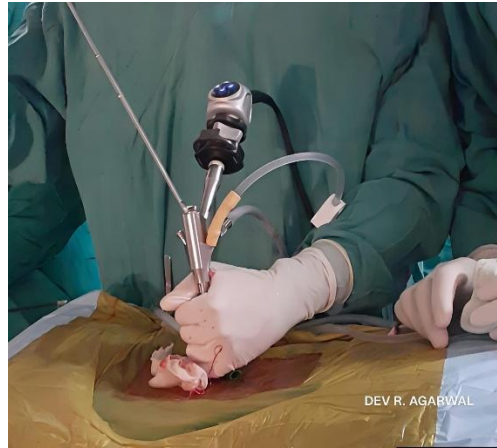
Two dural tears repaired intraoperatively and one superficial wound infection managed conservatively. No neurological deficits or revision surgeries occurred. Mean hospital stay was 1.8 days (range 1–4).

**Table 1: Demographics (age, sex, level).**

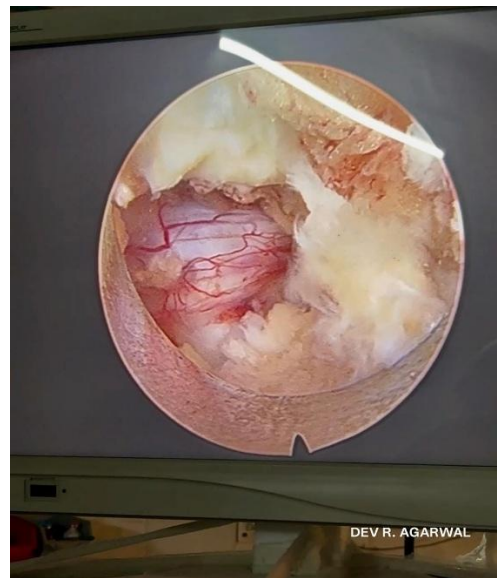
Parameter	Value	Range	%
Mean age (in years)	52	30–72	-
Sex (M/F)	24/16	-	-
Most common level (L4–L5)	24 cases	-	60

**Table 2: Clinical outcomes (VAS and ODI improvement).**

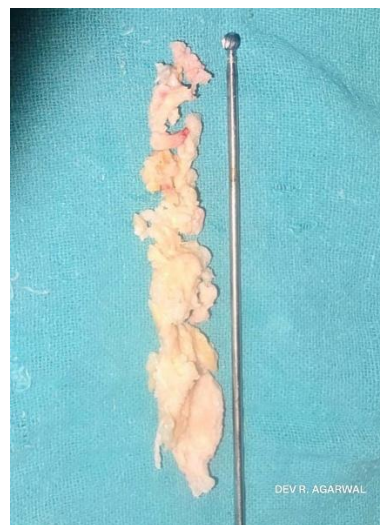
Parameter	Pre-op	Post-op	P value
VAS (leg pain)	8.1	2.1	<0.001
ODI (%)	62	18	<0.001



**Figure 1: Endoscopic spine surgery uses specialized instruments to surgically treat spinal disorders.**



**Figure 2: An intra-op picture of an endoscopic image during spine surgery after removal of herniated disc.**



**Figure 3: Removed disc fragments.**



**Figure 4: Incision is typically no larger than 8 mm.**

## DISCUSSION

The results align with literature demonstrating that endoscopic decompression provides comparable outcomes to open or microscopic techniques.<sup>1,3,4</sup> Ruetten et al reported equivalent long-term outcomes with reduced morbidity.<sup>1</sup> Ahn et al highlighted early mobilisation and shorter hospital stay.<sup>2</sup> Meta-analyses confirm that percutaneous endoscopic lumbar discectomy achieves similar results with fewer complications.<sup>5,6</sup> The technique continues to evolve for lumbar stenosis.<sup>7,8</sup> 40-case series supports these findings, showing significant pain and function improvement with minimal complications.

This study is limited by its retrospective design, relatively small sample size and single-centre setting. Larger multicentric prospective studies with longer follow-up are warranted to confirm these findings.

## CONCLUSION

Endoscopic lumbar decompression is a safe, effective and minimally invasive option in selected patients, offering

substantial pain relief, early mobilization and low complication rates.

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*Ethical approval: The study was approved by the Institutional Ethics Committee*

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