Structured Abstract

Background Context:

Minimally invasive lumbar decompression techniques continue to evolve, but approaches vary in visualization, access, instrumentation, and tissue-removal capability. Endoscopic LESS Invasive Decompression (ELID) is a microendoscopic tubular technique for targeted decompression.

Purpose:

To describe the technique and evaluate cadaveric feasibility across lumbar decompression trajectories, with preliminary clinical application in lumbar central stenosis.

Study Design:

Cadaveric technical feasibility study with preliminary consecutive clinical case experience.

Patient Sample:

Cadaveric evaluation included 51 lumbar target sites from L3-S1 across central, lateral recess/foraminal, and extraforaminal trajectories. Three patients with symptomatic lumbar central stenosis underwent interlaminar decompression.

Outcome Measures:

Cadaveric access/tissue removal; clinical operative metrics, complications, neurological status, and 4-week Visual Analog Scale scores.

Methods:

ELID uses tubular access with guidewire assistance, sequential dilation, working-cannula placement, and direct visualization. Cadaveric testing assessed trajectory access and ligamentum flavum/lamina removal. Clinical application was limited to three interlaminar decompression cases in an outpatient setting.

Results:

Access and tissue removal were achieved at all 51 cadaveric target sites. In three clinical cases, operative time was 45.3 ± 15.0 minutes, fluoroscopy time was 4.9 ± 3.1 minutes, and estimated blood loss was less than 5 mL in all cases. No complications or neurological worsening were observed through 4-week follow-up. VAS improved from 7.7 ± 0.6 preoperatively to 3.3 ± 0.6.

Conclusion:

ELID demonstrated cadaveric feasibility across multiple lumbar decompression trajectories. The limited interlaminar clinical experience was technically successful and supports further prospective evaluation of safety, durability, functional outcomes, radiographic decompression, and comparative effectiveness.

Keywords: ELID; lumbar decompression; microendoscopic tubular decompression; minimally invasive spine surgery; LESS; spinal stenosis; foraminal stenosis; interlaminar decompression; interventional spine