

MINIMALLY INVASIVE ENDOSCOPIC DISCECTOMY FOR LUMBAR DISC HERNIATION: A RETROSPECTIVE EVALUATION OF PAIN OUTCOMES AND SURGICAL EFFICACY AT A NIGERIAN TERTIARY HOSPITAL

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ABSTRACT

Background: Lumbar disc herniation (LDH), a significant cause of lower back pain and radiculopathy, significantly impairs quality of life. Endoscopic discectomy has emerged as a minimally invasive alternative to conventional open discectomy, with potential benefits such as reduced complications and shorter recovery time. However, its outcomes have not been systematically assessed in our setting.

Objective: To evaluate the pain outcome and complication rates of endoscopic lumbar discectomy among patients with symptomatic lumbar disc herniation at an Orthopedic referral Hospital in Kano, Nigeria.

Materials and Methods: A retrospective study was conducted on 26 adults aged 18–65 years with lumbar disc herniation who underwent single-level endoscopic discectomy between June 2022 and May 2023. Pain outcomes were assessed using the Visual Analogue Scale (VAS) at 24 hours, 3 months, and 6 months postoperatively. Endoscopic discectomy procedure associated complication rate was also documented. Statistical analysis was performed using SPSS version 26, with a significance threshold of $p < 0.05$. **Results:** A total of 26 patients met the inclusion criteria. The mean operative time was 83.5 ± 13.38 minutes. The most affected levels were L4/L5 and L5/S1 (88.5%). There was a statistically significant reduction in VAS scores for both low back pain and radicular pain at 24 hours, 3 months, and 6 months ($p < 0.001$). The overall complication rate was 7.6%, with no major adverse events reported.

Conclusion: Endoscopic lumbar discectomy is a safe and effective alternative to traditional discectomy, offering significant pain relief with minimal complications. Proper patient selection and precise surgical techniques are key to optimizing outcomes.

Keywords: Endoscopic Discectomy, Lumbar disc herniation, Pain Outcome, Visual Analogue Scale

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INTRODUCTION

Lumbar disc herniation (LDH) is a common spinal disorder resulting from protrusion of the intervertebral disc, leading to nerve root compression and associated pain syndromes¹. The lifetime prevalence of LDH is approximately 2-3% in the general population². Conventional management includes conservative treatment modalities such as physiotherapy, analgesics, and epidural steroid injections.³ However, in cases where symptoms persist despite conservative therapy, surgical intervention becomes necessary.³

Endoscopic discectomy is a minimally invasive alternative to open microdiscectomy, offering advantages such as reduced tissue trauma, shorter hospital stays, and faster recovery.⁴ This technique has gained popularity globally, yet there is a paucity of data on its outcomes in Nigeria.

The present study aims to evaluate the pain outcomes and complications of endoscopic lumbar discectomy among patients with symptomatic lumbar disc herniation at an orthopedic referral center in Kano.

MATERIALS AND METHODS

This retrospective, hospital-based study was conducted at the National Orthopedic Hospital, Dala-Kano, a major referral center for spine surgery in Northern Nigeria. The study included all adult patients (18–65 years) who underwent single-level endoscopic discectomy for symptomatic LDH between June 2022 and May 2023.

Inclusion criteria included patients with symptomatic LDH diagnosed via MRI, those that underwent single-level endoscopic discectomy and completed at least a six-month follow-up. Patients with multilevel degenerative lumbar spine disease, tandem

stenosis and those that underwent pedicle screw fixation and those with incomplete follow-up data were excluded from the study. All procedures were performed using the transforaminal endoscopic discectomy (TELD) technique under local anesthesia and mild sedation. The surgical approach was guided by fluoroscopy, and decompression was achieved by fragment removal with endoscopic forceps.⁵

Pain outcomes were assessed using the Visual Analogue Scale (VAS) at 24 hours, 3 months, and 6 months postoperatively. Complications such as dural tears, infections, and recurrence were documented.

Data were analyzed using SPSS version 26. Continuous variables were expressed as mean \pm standard deviation (SD), and paired t-tests were used to compare preoperative and postoperative VAS scores. Statistical significance was set at $p < 0.05$.

RESULTS

Demographic and Clinical Characteristics

The study included patients with a mean age of 45.6 ± 11.9 years, with a slightly higher proportion of females (53.8%) compared to males (46.2%). The most commonly affected spinal levels were L4/L5 and L5/S1, accounting for 88.5% of cases.

Pain Outcome Assessment

Preoperatively, patients reported significant pain, with mean Visual Analog Scale (VAS) scores of 7.6 ± 1.2 for low back pain and 8.1 ± 1.3 for radicular pain. At 24 hours postoperatively, there was a notable reduction in pain intensity, with mean VAS scores of 5.5 ± 1.0 for low back pain and 5.0 ± 0.9 for radicular pain ($p < 0.001$). Further

improvements were observed at three months, with mean scores decreasing to 3.2 ± 0.8 and 2.9 ± 0.9 , respectively ($p < 0.001$). By six months, pain relief was sustained, with mean VAS scores of 2.1 ± 0.7 for low back pain and 2.5 ± 1.0 for radicular pain ($p < 0.001$).

Complications

The overall complication rate was 7.6%. Minor complications included two cases of transient dysesthesia, both of which resolved without intervention. No cases of dural tears, infections, or reoperations were recorded during the follow-up period.

DISCUSSION

This study reviewed the outcomes of patients who underwent endoscopic discectomy within the study period. The mean age of the study population was within the fourth to fifth decades of life, consistent with findings from previous studies in Nigeria and globally.^{6,7} This age range is likely due to the degenerative changes in the intervertebral disc and the increased physical activity levels observed in this demographic. However, some studies have reported a higher mean age at diagnosis.⁸

There was a slightly higher proportion of females in this study, contrary to findings from other studies that reported a male predominance.^{7,8,9} This discrepancy may be attributed to differences in health-seeking behaviour, as females tend to visit clinics more frequently. Additionally, obesity, a known risk factor for disc herniation, is more prevalent among females in this region.

The most frequently affected spinal levels were L4/L5 and L5/S1, consistent with previous studies.^{6,7,8,10} This is likely due to the increased mechanical stress and mobility at these levels, as well as the thinner annulus

fibrosus and reduced support from the posterior longitudinal ligament. Similar findings have been reported globally, reinforcing the biomechanical predisposition of these levels to disc herniation.

Most patients presented with symptoms persisting between six months and two years before seeking surgical intervention. This delayed presentation may be due to initial conservative management, including physiotherapy and transforaminal steroid injections, which provide temporary symptom relief. However, studies have shown that early surgical intervention often yields better clinical outcomes. The predominant symptoms reported were low back pain and radicular pain, similar to previous findings.⁶

Pain relief was objectively assessed using the Visual Analog Scale (VAS). The results demonstrated a significant reduction in both low back and radicular pain following surgery. The reduction in VAS scores remained significant across all postoperative follow-up periods, with a substantial improvement observed within 24 hours. These findings align with previous reports^{10,12} that have demonstrated the effectiveness of endoscopic discectomy in providing rapid and sustained pain relief. The overall success rates observed in this study are consistent with reports from other researchers, which have shown high success rates with this procedure.¹¹

The complication rate was relatively low, with only two recorded cases. One patient experienced transient hyperesthesia that resolved with conservative treatment, whereas another patient required reoperation due to a postoperative hematoma. These findings are in line with previously reported low complication rates for endoscopic discectomy.^{10,12} Some studies have even reported zero complication rates,

further highlighting the safety of the procedure.¹³

Postoperative recovery was also favourable, with most patients returning to their premorbid activities within two to four weeks. This early return to function can be attributed to the minimally invasive nature of the procedure, which involves minimal tissue disruption, reduced blood loss, and the use of local anaesthesia where possible.

This study shows the safety and efficacy of endoscopic discectomy for lumbar disc herniation, with minimum complication rates, an early functional recovery, and good pain management. The findings align with existing literature and further validate the role of this minimally invasive approach in the management of lumbar disc disease.

However, the study is limited by its retrospective nature and small sample size. Future research should focus on prospective, multi-center studies with larger sample sizes.

CONCLUSION

Endoscopic lumbar discectomy is a successful, safe, and minimally invasive surgical option for symptomatic lumbar disc herniation. It provides significant pain relief with low complication rates. Careful patient selection and precise surgical technique are key to optimizing outcomes.

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AUTHORS' CONTRIBUTIONS

AIA conceptualized and conducted the study, collected data, analyzed results, and wrote the manuscript.

CN, MI and MAA supervised the conduct of the research and approved the final version of the manuscript

ARM participated in writing the final version of the manuscript and proof read the final version to be published

CONFLICT OF INTEREST

None declared.

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ETHICAL APPROVAL

Approved by the National Orthopedic Hospital Dala Research Ethics Committee (NHREC/NOH-DALA/6th/06/2023) dated 18th July, 2024.

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