

A Prospective Study of Outcome of Endoscopic Lumbar Decompression by Destandau's Technique

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Abstract: *Background:* Low back pain is major burden of the society and needs proper consideration to provide optimal care to the patients by taking help of novel and advanced technologies. Although conservative management is the main stay of treatment, surgery is indicated for patients when nonoperative management have failed to address the symptoms. In India, the Destandau technique has been widely accepted which ensures minimal iatrogenic trauma and extreme efficiency. *Methodology:* This was a prospective study conducted at Departments Orthopaedics, Government Medical College and Hospital over a period from July 2020 to January 2023 involving 25 Patients with complains of low back pain. *Results:* Mean Preoperative VAS was found to be 7.8 and post operative VAS was found to be 2. Mean pre - operative ODI score was found to be 62.72 and post - operative ODI score was found to be 7.84. Based on modified Macnab's criteria, 40% of subjects had Excellent, 40% good, 5% fair outcome. *Conclusion:* Endoscopic discectomy using the Destandau technique for lumbar prolapsed intervertebral disc is a safe and effective procedure in appropriately selected patients. The only drawback is long learning curve.

Keywords: Back pain, DestandauTechnique, endoscopic discectomy

1. Introduction

Low back pain is one of the major causes of chronic incapacity in adults aged <45 years. Apparently 77% of the population will present with back pain and 35% with sciatica, at least, once during their lifetime, and 10% of all lumbar disc herniation cases are candidates to surgery. Although nonoperative management is the main stay of treatment, surgery is indicated for patients who have progressive neurological deterioration or when nonoperative management have failed to address the symptoms. Despite various operative procedures available for lumbar disk surgery, from total laminectomy to microdiscectomy, endoscopic discectomy has its own place for its minor cosmetic incision, negligible tissue disruption, enhanced visualization because of better magnification and illumination, shorter hospital stays, and early postoperative recovery time. Out of several spinal endoscopic systems used for disc surgery, Destandau System, Yeung percutaneous endoscopic discectomy, and METRx system are considered viable alternatives to open disk surgery and are performed using standard microsurgical techniques via a minimally invasive approach. In India, the Destandau technique has been widely accepted. It was developed by Sir Jean Destandau from Bordeaux, France in early 1990s. This technique ensures minimal iatrogenic trauma and extreme efficiency. The use of an endoscope permits the same access port and the same surgical technique to be used on the vertebral canal and disc while at the same time reduces the skin incision and minimizes the access port. The advantages of this technique are the same as those for discectomy but the immediate postoperative complications are reduced allowing a more rapid rehabilitation and return to previous activities for the patient⁸. The size of the incision is small such that the scar does not exceed 3 cm. So, the procedure is less traumatic and more cosmetic. Moreover, this endoscopic approach to lumbar disc herniation gives maximum

exposure to disc space with the goal of curtailing cutaneous incision. The purpose of this study was to evaluate the functional outcome and possible complications of Destandau Technique of Endoscopic Lumbar Decompression.

2. Materials and Methodology

Source of Data: The study was conducted at Departments Orthopaedics, Government Medical College and Hospital over a period from July 2020 to Jan.2023 which involved 25 Patients with complains of low back pain.

Inclusion Criteria: i) Age group >18 years. ii) Patients of low back pain and leg pain who have taken conservative treatment. iii) Patients having neurological claudication. iv) Prolapsed Lumbar intervertebral disc. v) MRI finding - identification of a single nerve root compression

Exclusion Criteria: i) Age group <18 years. ii) Multilevel lumbar compression. iii) Cauda equine syndrome. iv) Patient with known spinal deformity. v) Patients with concomitant neurological disorders like Parkinsonism, Alzheimer's disease.

Pre - Operative: MRI Lumbosacral spine report and Xray Lumbosacral spine along with Preoperative investigations (ECG, PT - INR, Hb CBC, LFT, KFT, Blood Group, Chest X - ray) were done.

Operative: All surgeries were performed using the Destandau System in prone positioning. The skin incision was 15–20 - mm long made at a marked point, 5 mm away from the midline. With the help of Destandau system, depending on local findings, discectomy was performed, and only the loose pieces of the disc were taken out. Appropriate antibiotics started post operatively. Dressing was done on

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day 3 and day 7. Suture removal done on 9th day onwards depending on the condition of sutures.



Figure 1: Destandau system



Figure 2: Level Marking using fluoroscopy



Figure 3: Skin incision of 15 - 20 mm



Figure 4: Loose disc fragment removed



Figure 5: Post operative excellent range of motion

Statistical Analysis

Data was entered in windows excel format. Frequency tables and measures of central tendency (mean) and measures of dispersion (Standard deviation) were obtained by using the statistical package SPSS software. Outcome variables with a p - value less than 0.05 were selected and cross - tabulation was done to determine the strength and direction of the association between outcome variables.

3. Result

There were 14 male (56%) and 11 female (44%) patients. Mean age of the participants was 47.40 years. Lower lumbar levels L4, L5, S1 were more commonly involved in degenerative stenosis. Mean Preoperative Visual Analogue Score was found to be 7.8 and post operative Visual Analogue Score was found to be 2. Hence, we found highly significant ($p < 0.01$) pain relief in study subject. Mean pre - operative Oswestry Disability index score was found to be 62.72 and post - operative Oswestry Disability index score was found to be 7.84. Hence, we found highly significant ($p < 0.01$) improvement in the quality of life of study subjects. Out of the 25 patients, 3 patients (12%) developed complications with 1 being an intraoperative dural tear

which was managed uneventfully. 2 patients had Transient Paraesthesia which was recovered in 3 - 4 weeks by physiotherapy. Based on modified Macnab's criteria, 40% of subjects had Excellent, 40% good, 5% fair outcome.

4. Discussion

We compared our results with studies evaluating Destandau technique of lumbar discectomy. According to modified MacNab criteria we had 40% excellent, 40% good and 20% fair outcome. Similar results were found by Kaushal et al⁷ (n=300) with 90% excellent to good results, 08% fair results. Paresh et al¹ presented excellent results in 78.01% patients & good results in 17.9 % patients. Our study results were also comparable with Saransh et al³ who found 90% excellent to good results by Destandau technique of lumbar discectomy, Mahadeo Ghuge et al (2020)¹¹ 82.85% had excellent outcome, 5.71% had good outcome Comparable with Lyson et al (2008)⁴ where good to excellent outcome was achieved in 89% of patients, with Bhisare et al (2016)⁵ where 80.95% had excellent outcome, 14.28 had good outcome. The VAS score for leg pain in present study was significantly improved from preoperative average of 7.8 to 2 at final 1 year follow - up. Dey et al¹ reported similar

improvement in VAS score from 7.8 to 2 in a year. Similarly, Ghuge et al¹¹ found the VAS score for leg pain was significantly improved from preoperative average of 8.3 to 0.8 at final 1 year follow - up. In the present study, ODI score was reduced significantly from 62.72 to 7.84 (p<0.01). Comparable results were achieved by Mahadev et al¹¹. They also found improvement in their ODI score from 69.6 to 4.5. Dey et al¹ reported improvement in ODI score from 64 to 14. Complications reported in different series were dural tear, transient paresthesia or neuralgia, recurrence, root injury and wound infection. During present study, 8% patients had transient paresthesia which was recovered in 3 - 4 weeks by physiotherapy while 4% patients developed an intra - operative dural tear which was managed uneventfully. Similar results were observed by Mahadev et al¹¹. They found 3.8% patients had dural tear, 3.8% patients had recurrence of herniation, and 7.61% patients had transient neuralgia. Incidence of dural tear reported by Kaushal et al⁷, Dey et al¹ was 5% & 0.6% respectively. M Srinivasan (2022)⁸ reported duraltear in 4% and nerve root injury in 2% subjects. Prolonged operative time and technical difficulties in initial cases were the main reasons of these complications in our study.

5. Conclusion

Endoscopic discectomy using the Destandau technique for lumbar prolapsed intervertebral disc is a safe and effective procedure in appropriately selected patients. It provides good illumination, excellent visualization and amplification for the surgeon through a smaller incision. All of which help to reduce procedure related morbidity and also prevent serious complications. The only downside is the learning curve for this technique is long and requires a great deal of practice to improve triangulation, depth perception and hand eye coordination.

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