

Endoscopic Lumbar Discectomy By Destandau Technique - A Keyhole Approach For P. I. D.

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Introduction

Lumbar Discectomy for Prolapsed Intervertebral Disc (P.I.D.) associated with radicular symptoms in lower limb (*i.e.*, Sciatica) is probably the most widely performed spinal intervention.¹ Conventional open laminectomy and discectomy entails a lot of trauma to posterior elements, causing prolonged morbidity and even instability. Different endoscopic discectomy techniques^{2,3,4} have been developed recently to reduce the patient's sufferings and here, I want to present my early experience with Dr. Destandau's Technique of Micro-Endoscopic Discectomy.⁵

Aims and Objectives

To study the advantages and possible complications of this minimally invasive technique of endoscopic discectomy by Destandau technique.

Materials and Methods

26 cases of P.I.D. with severe unilateral radicular symptoms were treated by this technique since June, 2004. After thorough clinical examination to especially record the neurological findings in the affected lower limb and plain radiographs of lumbo-sacral spine, further investigation in the form of either M.R.I. or Contrast C.T.scan (Photos 1 & 2) was performed to ascertain the diagnosis and also to know the involved level.

There were ten cases of L5-S1 disc prolapse, thirteen cases of L4-L5 disc prolapse, one L3-L4 disc prolapse and two cases of two level discs (L4-L5 + L5-S1) operated through a single incision. There

were nineteen males and seven females. Lt. side was predominantly involved – twenty out of twenty-six .

Prone position on special spinal table was used. The prone position and approach are the same as used for usual posterior laminectomy . The paraposterior endoscopic technique developed by Dr. Jean Destandau from France was used. (Photo 3 & 3A).



Photo : 3

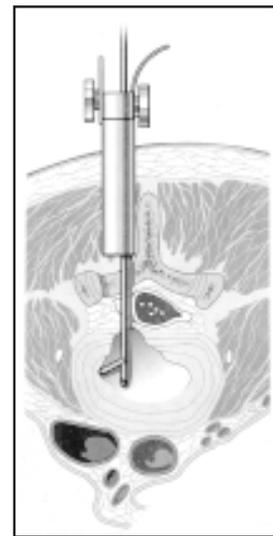


Photo : 3A

Instrumentation : There is a conical outer tube with an obturator (Photo 4), which facilitates its passage in the paraposterior space after incision. The operating insert (Photo 4A), which goes within this outer tube (Photo 4B), has four portals (Photo 4C) – one for standard 0 degree telescope (Storz) (Photo 4D) , the second one for suction cannula , the third largest one (7 mm.diameter) at 20 degrees

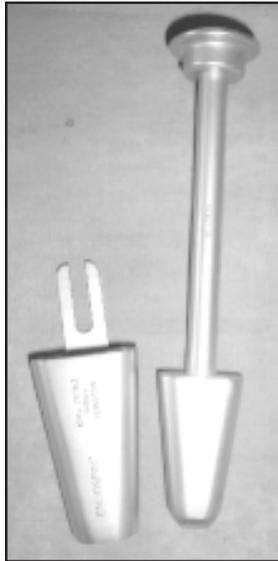


Photo : 4

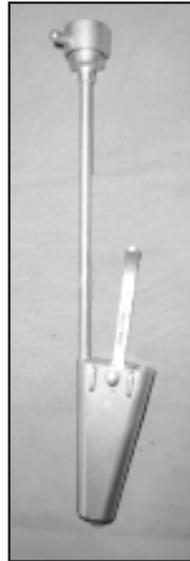


Photo : 4A

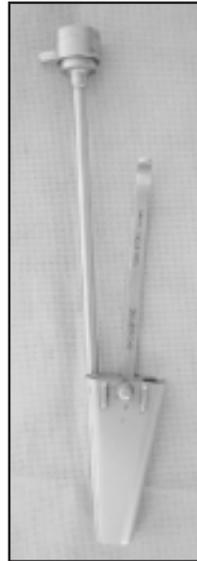


Photo : 4B

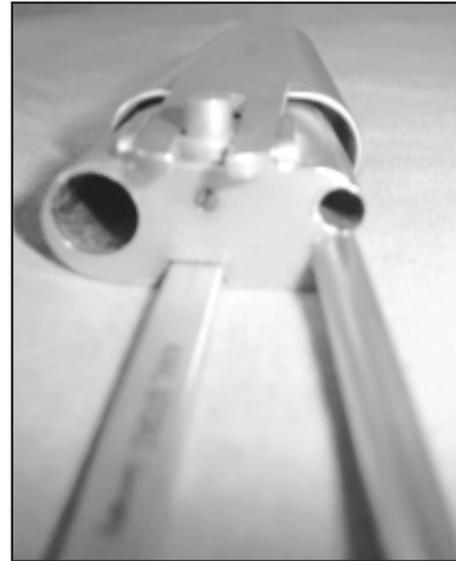


Photo : 4C

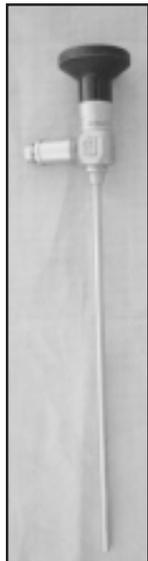


Photo : 4D



Photo : 4E



Photo : 5



Photo : 6A

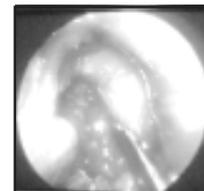


Photo : 6B

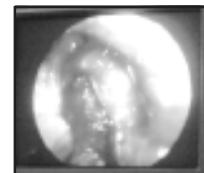


Photo : 6C

inclination to telescope portal for the working instruments and the fourth one is a fixed nerve root retractor , which can slide up and down. The 20* inclination of first two portals helps in keeping the tip of working instruments always under vision. The outer tube also has rachets for adjusting the depth of inner operating insert within the outer tube – this helps in selecting the magnification of the operating field.

The special localising device (Photo 4E) is used with IITV for exact localisation of involved

disc space and mark the incision. An artificial working space is created by introducing the operating insert within the conical outer tube, which is passed upto the lamina through a 15 to 18 mm. Incision (Intraop Photo 5) .The compressed root and underlying protruded disc are exposed by removing a small part of lower lamina and the intervening ligamentum flavum with 3 mm. Kerrison punches. (Photos 6A, 6B, 6C) After retracting the root gently with a spatula and later with the in-built nerve root retractor , sequestered disc can be removed with

the routine disc forceps. For a contained prolapsed disc, posterior longitudinal ligament is pierced with a small probe and discectomy performed under vision using the disc forceps. The magnification and proper illumination reduce the chances of neural damage (Photo 6B & 6C). Haemostasis can be achieved by special bipolar coagulating forceps and after saline wash, the wound is closed by three or four subcuticular vicryl sutures. Compression dressing is applied.

Postoperatively the patient is allowed to be out of bed the next day (Photo 8) and may be discharged in two to four days, if comfortable – as against approx. two weeks hospitalisation in a case of routine open discectomy. The patient can start his sedentary work much earlier – *i.e.*, in two to three weeks, but is refrained from heavy manual labour for at least six weeks postoperatively.



Photo : 8

Observations and Results

All patients had immediate relief from radicular symptoms. Patients were allowed to be out of bed and walk the same evening or on the next day and discharged in 2 to 4 days. Average hospital stay was 3, 4 days. They were allowed to resume sedentary work after two - three weeks. However heavy manual labour was deferred till six weeks post-op.

Conversion to open discectomy can be done easily in case of difficulty, by just extending the same incision - it was needed only in my first case due to a small dural tear. Complications included two cases

of infection – one superficial and one deep discitis, which settled eventually with rest and antibiotics and small dural tears were noted in two cases, with temporary neurodeficit only in the first case - it also recovered within two months. Blood loss was minimal and blood transfusion was required only when conversion to open was needed. The incision was closed with three to four subcuticular vicryl sutures and hence the scar was very much cosmetically appealing than the long one of routine laminectomy (Photo 7).



Photo : 7

Discussion

Conventional open discectomy entails removal of a lot of posterior bony and soft tissues - like spinous processes, supra & interspinous ligaments, lamina and ligamentum flavum – just to expose the dura and the emerging nerve root and to remove the prolapsed disc beneath. If the facet joint integrity is disturbed while extending the dissection laterally, there may even be instability at that particular level, requiring interbody fusion.

To reduce the surgical morbidity and allow early return to work, minimally invasive spine surgery evolved. Various endoscopic discectomy techniques have been developed – broadly the two subtypes of endoscopic discectomy are percutaneous procedures and minimal access endoscopic discectomy through an incision of 1.5 to 2 cm. Two main portals which are in use are para-posterior and posterolateral (foraminoscopy).



Photo : 7A



Photo : 9



Photo : 10



Photo : 11



Photo : 12

Para-posterior approach is the minimally invasive version of the well-proven posterior laminectomy approach for discectomy and deals directly with the underlying pathology in the spinal canal – ie. Prolapsed / sequestered / migrated disc.

Dr. Jean Destandau from France devised his own technique for this para-posterior minimal access endoscopy and has himself done more than 5000 cases since 1994.

With experience, apart from lumbar disc

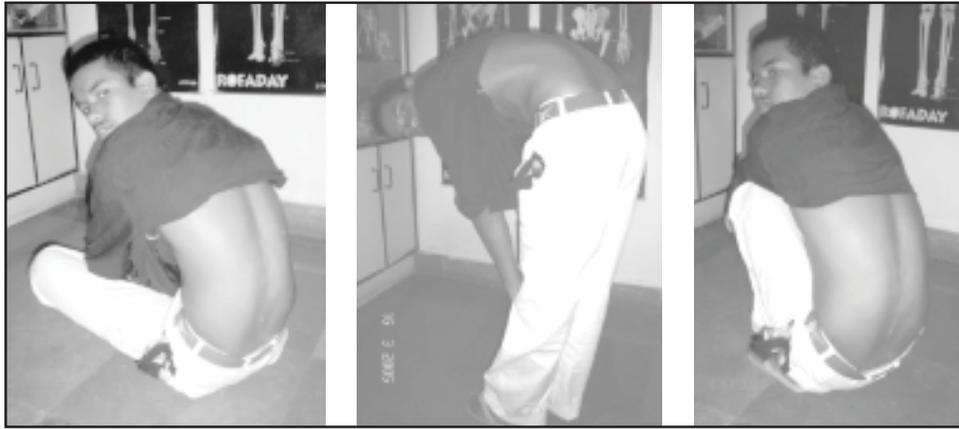


Photo : 13



Photo : 14A

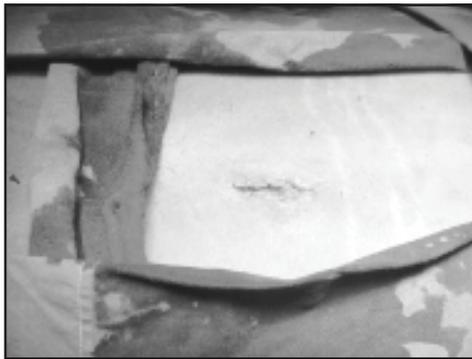


Photo : 14B

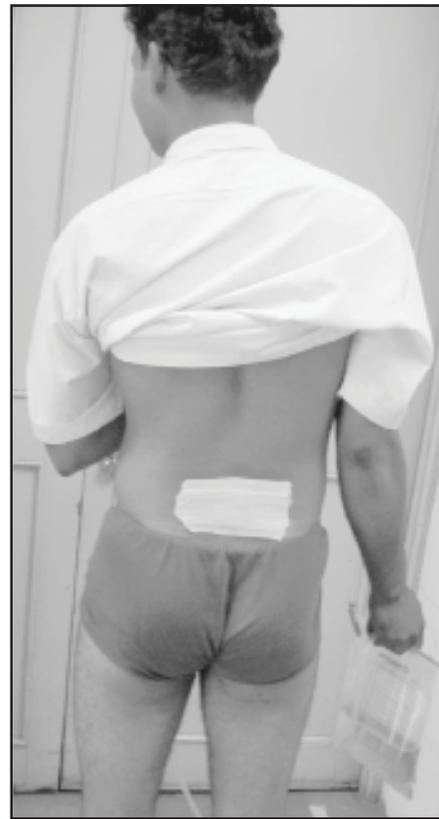


Photo : 14C

herniation, extended indications for endoscopic posterior spine surgery can be –

1. Cervical and Dorsal intervertebral disc prolapse⁵
2. Lumbar canal stenosis^{5,6}
3. Far lateral – *i.e.*, Foraminal disc prolapse
4. Other pathologies, like cysts from facetal

joints, discal cysts etc.⁷

5. Two-level disc prolapse – esp. L4-L5 & L5-S1 through single incision⁵

The advantages of any endoscopic discectomy procedure can be enumerated as follows –

1. Small incision & hence more cosmetic scar (Photo 7 & 7A)

2. Less invasive, with minimal tissue removal (Photo 6A)

3. Reduced blood loss – transfusion not usually needed

4. Less chances of neural damage due to magnification & good illumination - its like working with 'The Eye Within'

5. Less exposure to surroundings – thus low rate of infection

6. Minimal postoperative discomfort and morbidity (Photo 9, 10, 11, 12 & 13)

7. Reduced hospital stay

9. Proper data recording for future reference

In addition, Destandau technique has additional advantages like –

1. Approach and anatomy is familiar to every orthopaedic surgeon and thus easy adaption to technique

2. Easy conversion to open discectomy in difficult situations, especially in early learning curve

3. Two level discs can be tackled through the same incision by changing the inclination of operating tube (Photo 14)

4. Direct tackling of pathology in spinal canal (unlike posterolateral portal discectomy – *i.e.*, Foraminoscopy)

5. Simple and affordable instrumentation.

Prolonged operative time and technical difficulties in the initial few cases were the main reasons behind complications like dural tears, temporary neurodeficit and infections, as also noted by Nagakawa et al ⁸, Hussain et al ⁹ With further experience, the surgical time and thus the associated complications could be minimised.

Conclusion

In cases of lumbar disc herniations with radicular symptoms, Micro-Endoscopic Discectomy by Destandau technique definitely reduces morbidity, with good cosmesis as compared to conventional open laminectomy and discectomy. It can also be used in Lumbar canal stenosis and cervical disc prolapse with root symptoms in upper extremity. However proper training and experience are vital for good results.

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