

Review Article

Prospect of Destandau microendoscopic lumbar discectomy in Bangladesh.

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Introduction

Now a days Endoscopic methods are increasingly becoming popular in spine surgery especially for lumbar disc herniation in developed countries and also in developing countries like India. Although endoscope is used since longtime by general surgeons & urologist in our country but use of endoscope is not a common option for spine surgeons. Most patients are reluctant to undergo disc surgery because of the fear of spine weakness, post operative pain, long immobilization etc. Endoscopic treatment for lumbar disc prolapse by Destandaus procedure need only 1.5 to 2 cm skin incision, minimum paravertebral muscle stripping, short hospital stay and early return to work. So endoscopic procedure can be a standard option for lumbar disc herniation in our country. spine surgeons can use endoscope cost effectively with good outcome because most centre has basic unit (light source, camera, monitor) which is used by other specialty. Spine surgeon needs only a endoscope & other instrument which is not so expensive.

Destandaus Endoscopic Discectomy

Backpain & sciatica is very common complain encountered by spine surgeon. Most of this patient have herniated lumbar disk. Herniated disc material can be contained or noncontained. In the case of noncontained disc herniation, relatively large amount of disc material can be displaced and even sequestered and migrated. Therefore, it is not easy to remove migrated disc fragments successfully by most of minimal invasive surgical procedure like chemonucleolysis with papain, various modifications of percutaneous discectomy, percutaneous laser discectomy, and intradiscal electrothermyl. 1. The endoscopic discectomy procedure advocated by Dr. Jean Destandau M.D., an eminent Neurosurgeon from France - the pioneer of this technique - with his own designed instruments is suitable for both contained & noncontained disk herniation. Standard surgical technique for noncontained lumbar disk is through the posterior approach discectomy^{2,3}. The use of an 1.Khan

1. Khan Asaduzzaman. Consultant .Department of Neurosurgery.Khwaja Yunus Ali Medical College Hospital. 2.Masud Anwer. Associate Professor. Department of Neurosurgery.Khwaja Yunus Ali Medical College. endoscope in Destandaus method allows the same access port and same surgical technique to be used on vertebral canal and disc while at the same time reducing the skin incision. The advantages of this technique are the same as those for open discectomy but the immediate postoperative effects are reduced allowing a more rapid rehabilitation and return to previous activities. Reduced size of incision also represents an aesthetic advantage.

Instruments And Preparation : This surgical equipment and these instruments^{4,5},are necessary to perform endoscopic lumbar discectomy.

- Digital fluoroscopy equipment (C-arm) and monitor
- Full radiolucent C-arm/fluoroscopic carbon-fiber surgical table (Optional)
- Endoscopic tower equipped with digital video monitor, DVT/VHS recorder, light source, photo printer, with digital camera system
- Destandaus endoscopic discectomy set (Karl Storz,), including 4-mm 0-degree endoscope
- Endoscopic tower equipped with digital video monitor, DVT/VHS recorder, light source, photo printer, with digital camera system.
- Determination of the point of incision: By means of a special localization device the point of incision and the direction of approach is determined under fluoroscopic control.

Skin incision and approach: Skin incision is about 15 to 20mm which is made at marked point then fascia incised with scissors. The underlying paravertebral muscles are retracted laterally and any bleeding is coagulated. A 12 mm bone chisel is inserted and paraspinal muscle detached from spine and lamina.

Dilatation of soft tissue with the endospine operating tube: The ENDOSPINE operating tube with its obturator is pushed through the incision in the direction of interlaminar space, after which the obturator is removed. Any soft tissue that bulges into the operating cone may be removed using a rongeur.



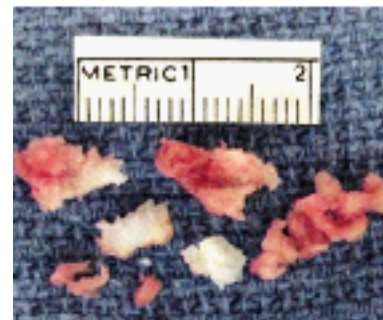
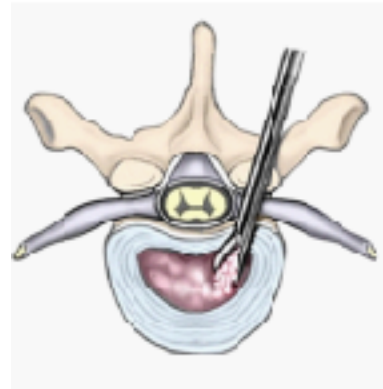
Preparing the working insert: The device ENDOSPINE has three access ports, one for the endoscope (4 mm. in dia.), another for suction cannula (4 mm. in dia.) and the largest for surgical instruments (9 mm. in dia.) The first two are parallel and the third is at an angle of 12 degrees with the tubes converging in the plane of posterior longitudinal ligament. The angulation enables the surgeon to keep the distal ends of instruments in view at all times and to use the suction cannula as second dissecting instrument. The endospine also includes a nerve root retractor that can be used to retract the nerve root medially.

Fenestration of lamina: This involves resection of part of the superior lamina and part of the intervertebral articulation, with exposure of the dural sac and nerve root. Resecting the bone enables easier access to the herniated disk without any traction on the nerve root, ensuring integrity of other nerve roots that might adhere to the main root

Resecting ligamentum flavum: Resecting the bone

allows access to the superior insertion of the ligamentum flavum. This insertion is also resected using the 90° Kerrison punch.

Dissection of the nerve root and resection of the herniated disc: Once the nerve root has been accurately identified, it is dissected using a nerve retractor. The epidural veins may be coagulated if necessary with specially designed bipolar cautery. Using the integrated nerve retractor, the nerve root can be pushed medially, allowing access to the herniated disc without any danger to the neural structures. Depending on local findings, discectomy involving the extraction of the easily mobilized parts of the nucleus pulposus can be done. If necessary foraminotomy and hemilaminectomy and lumbar canal decompression also can be done by removing contralateral ligamentum flavum and undersurface of opposite lamina.



Post Operative Care

The patient is checked neurologically prior to leaving the operating room. Ambulation begins immediately after recovery, and the patient is usually discharged within 24 hours after surgery. They may shower the following day. Mild analgesics only prescribed at discharge. A progressive exercise program begins from the second post-op day. Usually patients are allowed to return to work in one to two weeks, provided heavy labor and prolonged sitting are not involved. Most patients found this procedure extremely gratifying.

Why this Destandau microendoscopic procedure ?

This endoscopic procedure allows adequate removal of lamina and if necessary medial part of facet, which allows good and adequate root decompression. For canal stenosis adequate decompression is possible. Migrated, extruded and herniated discs, old sclerotic discs are also comfortably excised with this procedure because of medial, lateral, cranial and caudal maneuverability of the endoscopic system, 8,9,10. L4-5 and L5-S1 discs can be removed through a single 15-20 mm. incision because of the angulation of sacrum.

Advantages : The advantages 11,12 of Destandaus endoscopic discectomy are numerous; in addition to those of MISS, advantages include:

- Small incision and less scarring without multiple or large incision
- Minimal blood loss
- Zero mortality
- No significant infection
- Avoiding injury to blood vessels.
- No spinal fusion or fixation needed.
- Minimum dissection of muscle, bone, ligaments, or manipulation of the dural sac, spinal cord or nerve roots
- Little or no epidural bleeding.
- Minimal use of analgesics post-operatively.
- Same-day outpatient procedure.
- Less traumatic, physically and psychologically.
- Does not promote further instability of spinal segments.
- Early return to usual activities including work.
- Costs same as conventional discectomy.
- Multiple level discectomy feasible and well tolerated 14, 15,
- Direct endoscopic visualization and confirmation of the efficacy of surgery contribute to a safe and effective outcome.

Potential Complications And Their Avoidance

A thorough knowledge of the procedure and surgical

anatomy of the th spine, careful selection of patients and pre-operative surgical planning with appropriate diagnostic evaluations facilitate the endoscopic discectomy and prevent potential complications. All potential complications of open lumder discectomy are possible but rare or much less frequent, 16, 17

Infection: Avoided by careful sterile technique, using prophylactic antibiotics I-V intraoperatively and the much smaller incisional area compared to open discectomy.

Hematoma: (subcutaneous and deep): May occur with endoscopic discectomy but is minimized by careful technique, the small incision (15 mm), not prescribing aspirin or NSAID's within a week prior to surgery, and by application of digital pressure or an I-V bag over the operative site for the first 5 minutes after surgery, and application of ice bag thereafter.

Neural injury: Extremely rare with endoscopic discectomy.; no spinal cord injuries have been reported.

Improper localization: A major complication of all disc surgeries is operating at the wrong level. Proper utilization of C-arm fluoroscopy for proper anatomical localization avoids complications caused by poor placement of instruments or operating at the wrong disc level.

Dural tears: These are same like all other approaches to the lumbar disc.

Soft tissue injuries due to prolonged forceful retraction, as occurs in many disc operations, are not at issue with endoscopic procedure.

Inadequate decompression of disc material: Minimized by using multiple modalities and instruments and also better visualization.

Discussion

Destandaus endoscopic discectomy is a minimally invasive surgical procedure for treating symptomatic herniated lumbar discs through an operating endoscope with much less tissue trauma and zero mortality. It has numerous advantages, but requires thorough knowledge of the surgical anatomy, the endoscopic discectomy procedure, specific surgical training and hands-on experience in a laboratory and working closely with an experienced endoscopic surgeon through its steep surgical learning curve, in order for a MISS surgeon to become competent and avoid possible complications.

Conclusion

Endoscope has made strides in all fields of medicine. There is no doubt that future of surgery lies in development of minimally invasive techniques and spinal surgery also does not escape this rule.

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