Case Report

The transition from microscopic to endoscopic: Spine surgery

K. Madhsuthan*

Consultant Neurosurgeon. Kauvery Hospital, Cantonment, Trichy, Tamil Nadu
*Correspondence

Abstract

Background: Spine surgery is done traditionally as an open laminectomy or microscopic surgery. Endoscopic surgery started way back in 1973 when Parviz Kambin first described Kambin's triangle. Then lot of developments were made in transforaminal spine surgery. Interlaminar endoscopic surgery was started in 1990 but became famous after 2010. Lot of developments and fine tuning in instrumentation have created a huge surge in endoscopic spine surgery from last decade. Here we discuss our experience with mono-portal endoscopic lumbar disc surgery and its outcome in patient satisfaction.

Key words: Spine surgery; Kambin's triangle; Microlumbar discectomy

1. Introduction

Microlumbar discectomy has been the gold standard of lumbar disc surgery since the invention of microscope [1] . Though endoscopic spine surgery started long ago , it didn't gain much acceptance . Transforaminal endoscopy had its limitations 1.local anesthesia 2. interference from iliac crest 3. migrated disc 4. different anatomical orientation . With the advent of interlaminar endoscopy , the acceptance increased and now any surgery including spinal tumors and fusion can be done by endoscopy. Though the learning curve is steep , for microscopic surgeons it is bit easier . It offers good magnification and 360 dec visualization . Endoscopic surgery has shown consistent and good patient satisfaction scores for all ages .

2. Materials and methods

In this paper we discuss our initial experience with endoscopy . There were 15 patients both male and female . Pure lumbar disc without severe canal stenosis was chosen. Age of patients ranged from 30-50.

Patients with severe canal stenosis and spinal instability were excluded .

Table 1 describes the patient age , side of disc protrusion, migration of disc , complications and pre surgery and post-surgery VAS score

Citation: K. Madhsuthan. The transition from microscopic to endoscopic: Spine surgery. Kauverian Med J. 2026;3(8):32—36.

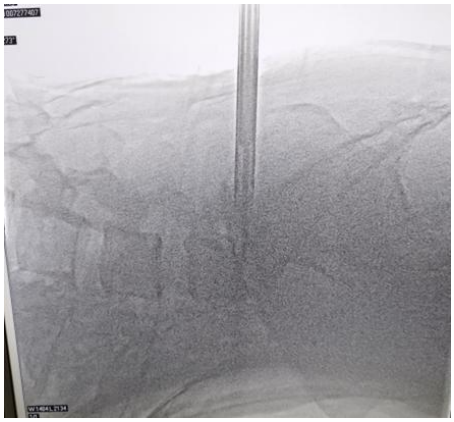
Academic Editor: Dr. Venkita S. Suresh

ISSN: 2584-1572 (Online)

S no	Age	Disc level	Rt/lt	Migration	Sur hours	Complica-tion	VAS score
1.	34	L5-s1	Rt	No	4.5	Na	8-0
2	30	L5-s1	Lt	No	4.5	Na	10-0
3.	35	L5-s1	Lt	No	4.0	Na	7-1
4.	40	L4-l5	Lt	No	4.0	Na	8-0
5.	50	L5-s1	Rt	Inferior	2.5	Na	10-0
6.	35	L4-l5	Rt	No	4.0	Numb/temp weakness	7-1
7.	50	L5-s1	Lt	No	3.0	Na	6-0
8.	32	L4-l5	Lt	No	3.0	Na	6-0
9	36	L4-l5	Rt	Superior	2.5	Na	8-0
10	43	L5-s1	Rt	No	2.5	Na	7-2
11.	41	L5-s1	Lt	Superior	4.0	Na	6-0
12	36	L4-l5	Lt	Inferior	2.0	Na	8-0
13	38	L5-s1	Rt	Inferior	1.5	Na	9-0
14	32	L5-s1	Rt	Inferior	1.0	Na	9-0
15	49	Ll5-s1	Rt	Superior	1.0	Na	8-0

3. Procedure

Patients were placed in prone position in halls frame or in normal frame with kyphotic bend to open the interlaminar window. Both AP and lateral C arm images were taken continuously. The trocar was placed in the V point (juntion of lamina and facets). Depth of trocar verified using lateral C arm picture targeting for the disc space .



Fig(1): Lateral C arm picture

Once the trocar in place ,the sheath is inserted and the bevelled edge is directed medially . The scope is inserted and soft tissue cleared with RF coagulation and grasper .Ligamentum flavum identified and opened and discectomy done.

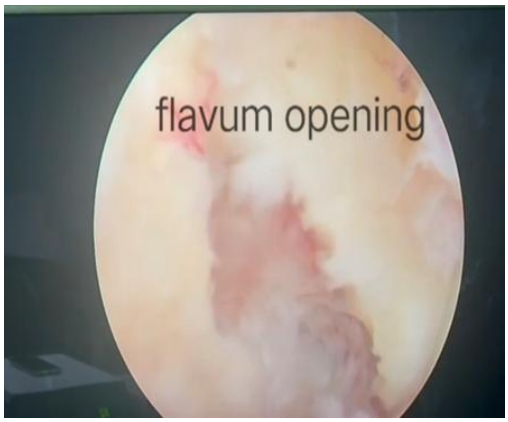


Fig (2): Sheath was rotated to protect the root and discectomy completed . The annulus defect was sealed with low current RF

4. Results

All patients had excellent post-postop recovery . One patient who had a tight canal had postop numbness and temporary weakness because of root handling. There was significant improvement in immediate and follow-up VAS score. Postop MRI was also done to assess the adequacy of disc removal . Postop MRI showed adequate disc removal and root decompression.

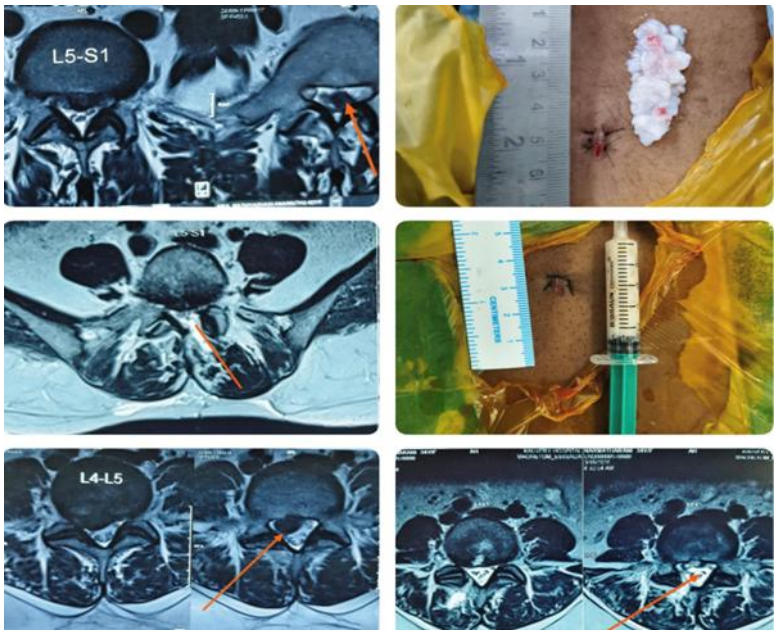


Fig (3): Patient mobilized the next day and were discharged immediately. There was no undue bleeding , wound CSF leak, infection. The back stiffness usually encountered in microsurgery was evidently absent in all cases of endoscopic discectomy

5. Discussion

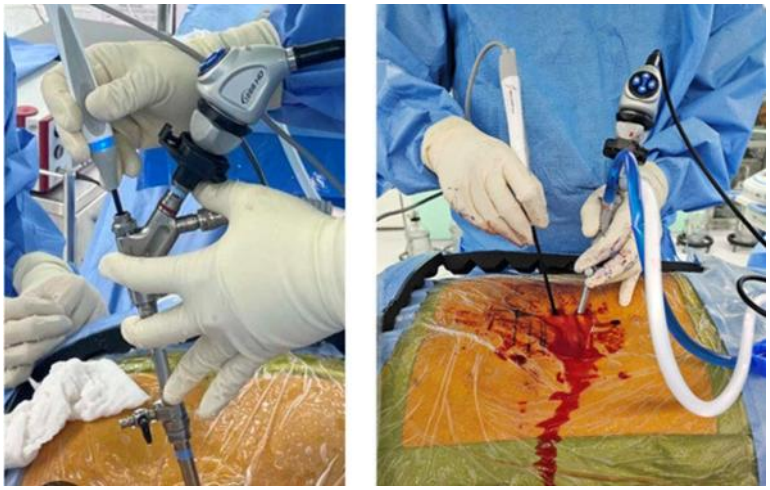
Endoscopic discectomy can be done through interlaminar approach or a transforaminal approach. Transforaminal approach have its own advantages like surgery for foraminal and extraforaminal discs . Similarly, it has also its own disadvantages. Initially the interlaminar endoscope systems were air-based systems. They employed larger sheaths and bigger incisions and a little bit of muscle dissection. Hemostasis was also difficult. Water

based systems offer smaller working sheaths and continuous irrigation and RF coagulation provides a clear operating field[1]. The newer systems have better 360-degree visualisation and can be easily angulated to higher levels. This makes it easier to perform discectomy for high or low migrated disc.

There are two endoscopic techniques

- Monoportal
- Biportal

In monoportal the camera and working instruments are inserted through some small incision. Whereas in biportal, through one incision we bring the camera and through another incision we bring the working instruments. Monoportal endoscopy has the advantage of better visualization and no blind areas but with some limitation of instrumentation[2].Biportal technique is relatively easy with better instrument maneuverability .In microscopic discectomy there is muscle dissection which causes significant postoperative back stiffness. Dural injury and csf leak can happen with all techniques and that is surgeon dependent. But in monoportal endoscopy because there is no dead space wound CSF leak is absent even with dural injury.[3]



Fig(4): Monoportal and biportal endoscopy

We use the monoportal endoscopic system with RF (radiofrequency) coagulation. We achieved very good results with excellent patient outcome . VAS score was reduced to zero in most cases, and it was immediate and during follow-up. Blood loss was very much negligible and back pain which is experienced in microscopic discectomy is almost absent . No complications like CSF leak, infection, failure back, disc recurrence encountered so far.

6. Conclusion

Though endoscopic disc surgery has a steep learning curve ,once learnt it gives immense patient and doctor satisfaction. The recovery is fast with very less complication. Endoscopic discectomy has evolved as a safe and good alternative to traditional microscopic discectomy. With new inventions in instruments and increasing surgeon efficacy , even complex procedures like endo fusion and tumours are dealt with endoscopy at ease.

Reference

[1] Muthu s, Ramakrishnan E,Chellamuthu G. is endoscopic discectomy the next gold standard in the management of lumbar disc disease? Global spine J2021;11:1104-20

[2] Carrascosa-GranadaA,Velazquez W,Wagner R,Jorquera M, et al. comparative study between uniportal full endoscopic interlaminar and tubular approach in the treatment of lumbar canal stenosis : a pilot study. Global Spine J 2020;10:70s-78s

[3] Lee CW, Yoon KJ, Jun JH. Percutaneous endoscopic laminectomy with flavectomy by uniportal, unilateral approach for lumbar canal or lateral recess stenosis. world Neurosurg 2018;113:e129-37