ORIGINAL ARTICLE

Outcomes in terms of pain relief and early return to work in patients with lumbar disc excision through interlaminar endoscopic technique

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Abstract

Objective: We aim to evaluate the outcome of the patient undergoing endoscopic interlaminar disc excision in terms of pain relief and early return to work, especially in our society where labour population dominates and puts burden over the economical condition of the society.

Material and Methods: We included about 60 patients in our study period from January 2021 to December, 2021 having 42 male and 118 female patients who fulfil the inclusion and exclusion criteria. Pre op Vas pain score and post op Vas pain score was evaluated in order to see improvement in pain score and time to return to work among patients were also assessed. Data were analyzed using SPSS version 23 and chi-squre test of independence was applied taking p-value ≤.05 as statistically significant.

Results: A total of 60 patients were included in the study, out of which 70% were men and 30% were women with an average age of 35.45 years, with a standard deviation of 8.75 ranging from 20 to 57. 61.7% of patients had excellent results, 25% had good outcomes, 8.3% had fair outcomes, and 5.0% had bad outcomes based on Macnab's Score. In this investigation, the mean VAS score was 2.27±2.21. From 0 to 10, the scores were given. The patients' average level of post-operative pain was mild, according to the comparatively low mean VAS score. According to the findings, 61.7% of patients had pain alleviation, compared to 38.3% who did not. This suggests that a sizable number of patients experienced pain reduction following surgery. The findings indicated that, in terms of sexual activity, 60% of patients reported an improvement, 36.7% reported no change, 1.7% had worsening sexual activity, and 1.7% reported no sexual activity following surgery. 16 patients joined their daily routine and work place within 1 month of the surgery, 08 patients returned to work in next 3 months and 10 patients started work within 6 months and remaining started in next 6 months, rendering it highly successful mode of the surgery in term of early return to work and pain relief after lower back pain

Conclusion: In conclusion percutaneous endoscopic interlaminar disc excision is very effective not only in management of the symptoms but also early return to work post operatively. This technique can help a lot in minimizing the health-related burden on economy and minimum post-operative pain and hospital stay, significantly playing the role in population of the developing countries.

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Introduction:

Lower backache is one of the major health risk factors in our population with up to 33% having lower back pain once in their lifetime,[1] and it is the major cause of chronic disability below 45 years of age.[2] In most cases, the lumbar disc herniation pain will resolve with anti-inflammatories and analgesics within 6 weeks. However, some patients require epidural steroid injections[3] and among the total cases of lumbar disc herniation, approximately 10% are refractory to the conservative management and fulfil the cri-

Table 1: Distribution of patients according to demographics and functional outcome

Variables	N	%	Mean±SD (Range)
Gender			
Male/Female	7:3		
Age (years)			35.45±8.75 (20-57)
Macnab's Criteria			
Excellent	37	61.7	
Good	15	25.0	
Fair	5	8.3	
Poor	3	5.0	
VAS score			2.27±2.21 (0-10)
Pain Relief			
Yes/No	37/23	61.7/38.3	
Sexual Activity			
Improved	36	60.0	
Same	22	36.7	
Worse	1	1.7	
None	1	1.7	

teria for surgery, in terms of unremitting pain, neurological deficit and personal unsatisfied.[4] So, lower backache is a major burden of society causing major disability and one of the major concerns of health care authorities and a general impacton the economy. In addition, it has significantly been associated with depression, anxiety and psychological stress.[5,6]

In terms of recent advancements, spine surgery has been raised in the form of microscopic lumbar disc excision and endoscopicdisc excision.[7] The minimally invasive procedures have significance and superior outcomes in terms of minimum incision mark, improved illumination and magnification, minimum soft tissue damage, reduced Dural scaring, minimal hospital stay and early return to work.[8,9]

In this study, we aim to evaluate the outcome of the patient undergoing endoscopic interlaminar disc excision in terms of pain relief and early return to work, especially in our society where the labour population dominates and putsa burdenon the economic condition of society. Hence, effective and long-term workplace contribution is the way to go for individuals and society.

Foley and Smith[10] and Mayer and Brock[11] explained the endoscopic discectomy techniques. Of the various techniques of endoscopic discectomies, the METRX system, yeung percutaneous endoscopic system, and Destandauendospine systems are used as an alternative to open disc surgery.[9] These procedures are performed using the minimally invasive approach. The major complication associated with endoscopic intralaminar discectomy is reported to be a dural tear.[12,13]

Material and Methods:

We included about 60 patients in our study having 42 male and 118 female patients who fulfil the inclusion and exclusion criteria. In these patients, the procedure was performed with general anaesthesia, and the patient was taken to a prone position on a radiolucent table. The whole procedure was informed to the patient. An incision about 10-12mm from midline was made, the spinal needle of 18 gauge was introduced and under fluoroscopic guidance was inserted up to the medial pedicular line on AP view and posterior vertebral line on lateral view. The guide wire was passed over the spinal needle and the needle was removed, small skin incision was made, a tapered cannulated obturator was introduced, and after touching the annulus obturator was introduced in the disc and a bevel-ended oval shaded working cannula was introduced along the obturator in the disc and obturator removed. The endoscope introduced through the cannula disc was removed using a small forcepsin and out approach. All the herniated segments were removed and the endoscope removed a single suture applied to the skin and antiseptic dressing was applied. Pre-op V pain score and post-op Vas pain score were evaluated to see improvement in pain score and time to return to work among patients was also assessed.

Result:

A total of 60 patients were included in the study, out of which 70% were men and 30% were women with an average age of 35.45 years, with a standard deviation of 8.75 ranging from 20 to57. 61.7% of patients had excellent results, 25% had good outcomes, 8.3% had fair outcomes, and

Table 2: Association between demographic profile and functional outcome

	Macnab's Criteria				
	Excellent	Good	Fair	Poor	p-value
Gender					
Male	27	10	2	3	0.300
Female	10	5	3	0	
Pain Relief					
Yes	23	10	4	0	0.127
No	14	5	1	3	
Sexual activity					
None	1	0	0	0	0.342
Improved	26	7	3	0	
Same	9	8	2	3	
Worse	1	0	0	0	

5% had bad outcomes based on Macnab's Score. These ratings show that the majority of patients experienced positive outcomes, which shows that the interlaminar endoscopic procedure is successful in producing favourable clinical results In this investigation, the mean VAS score was 2.27±2.21. From 0 to 10, the scores were given. The patients' average level of post-operative pain was mild, according to the comparatively low mean VAS score. According to the findings, 61.7% of patients had pain alleviation, compared to 38.3% who did not. This suggests that a sizable number of patients experienced pain reduction following surgery. The findings indicated that, in terms of sexual activity, 60.0% of patients reported an improvement, 36.7% reported no change, 1.7% had worsening sexual activity, and 1.7% reported no sexual activity following surgery. Overall, the table shows that patients who underwent lumbar disc excision utilising the interlaminar endoscopic approach saw favourable outcomes in terms of pain alleviation, clinical ratings, and better sexual activity. There is no significant association between demographic profile and functional outcome as $p>.05$.

Discussion:

Roughly 75-85% of patients suffer from lower back pain once in their life time in capacitating the daily routine and occupation work resulting in one of the major causes of the financial burden and leaves from the workplace, significantly affecting the population of third world countries where a major portion of the population belongs to labour. Initially, lower back pain starts with pain and leads to the numbness of lower extremities and motor loss, in the presence of ineffectiveness of the conservative treatment. Lower back pain is first treated with conservative treatment and only 1-5% of patients' lower back pain requires surgical treatment owing to the failure of conservative treatment or sudden abrupt numbness and neurological deficit.

Percutaneous endoscopic interlaminar disc excision is one of the latest modalities which in a shorter period proved to be beneficial in terms of early return to work and effectively treating the pain and neurological deficit in patients of lower back pain due to prolapsed discs. Previously open disc excision technique was the only technique to effectively treat the cause but at the expense of more hospital stay, longer incisions and surgical site pain. Due to the latest technique, the effectiveness of this surgical technique in alleviating pain and neurological symptoms is obscured in the literature which needs further research and assessment. This technique is widely popular regarding minimal hospital stay, minimal soft tissue trauma particularly posterior ligament complex and other structure, in turn, minimum infection rate and post-op surgical site pain but very few surgeons have mastered the technique and even in certain regions of the world, this technique is not available altogether, particularly in third world countries where lower back pain is major burden socially, psychologically and economically. Inexperience often leads to failure of the effectiveness of the technique and can cause frequent complications like infection, nerve root damage, recurrence, Dural tears, vascular trauma, meningitis and death.

As for as the literature is concerned is effective for all types of lumbar disc excisions. But the placement of the nucleus pulposus in different dimensions and the use of a suitable approach concerning the location of the nucleus pulposus can pose a serious threat to the outcome. For example, if you make the working channel in the centre of the spinal cord this can herald the

soft tissue identification in the first view of the endoscope. Similarly, a previous study reported the location of the nucleus pulposus is associated with inadequate decompression. The limited field of surgery and view associated with the inappropriate placement of a working cannula can easily damage the nerve root and can cause difficulty in surgery. To prevent nerve root damage, the Chengde Medical University, Chengde, Hebei Province, China retrospective study proposed the idea of "nerve root as the core" which states the use of a c-arm to correctly place the cannula with respect to the location of the prolapsed disc[14] Our study supports the idea of increased failure rate using this technique due to inappropriate placement of the working cannula with respect to the disc particularly central disc, which was reported in the study of unsuccessful percutaneous endoscopic lumbar discectomy which was undertaken in 10228 cases.[15]

Previously central disc protrusion was considered to be a contraindication for percutaneous endoscopic interlaminar disc excision owing to the increased failure rate which was then negated later on with the concept that the failure rate can be reduced by making the working channel close to the posterior midline.[14] Our study showed that in the case of a central prolapsed disc, the entry port closer to the posterior midline reduced the failure rate up to 78% as compared to the conventional entry points.

A total of 60 patients were included in the study, out of which 70% were men and 30% were women with an average age of 35.45 years 61.7% of patients had excellent results, 25.0% had good outcomes, 8.3% had fair outcomes, and 5.0% had bad outcomes based on Macnab's Score. The patients' average level of post-operative pain was mild, according to the comparatively low mean VAS score. According to the findings, 61.7% of patients had pain alleviation, compared to 38.3% who did not. The findings indicated that, in terms of sexual activity, 60.0% of patients reported an improvement, 36.7% reported no change, 1.7% had worsening sexual activity, and 1.7% reported no sexual activity following surgery. 16 patients joined their daily routine and workplace within 1-month of the surgery, 08 patients returned to work in the next 3 months and 10 patients started work within 6-months and the remaining started in the next 6-months, rendering it a highly successful mode of the surgery in term of early return to work and pain relief after lower back pain.

The outcome in this surgery largely depends upon the mode of work and severity of physical work, follow-up, and successful post op rehabilitation. Our study showed no case of nerve root damage, infection, post-operative fever or significant headache. All the patients were discharged on the first post-operative day with a proper rehabilitation program.

This current study had few limitations having a long learning curve rendering the junior surgeon to effectively establish the accurate working port. Many patients were excluded owing to the highly migrated and large protruded disc. Although this surgery has impressive short-term results but still needs long-term follow-up.

Conclusion:
In conclusion, percutaneous endoscopic interlaminar disc excision is very effective not only in the management of the symptoms but also in early return to work post-operatively. This technique can help a lot in minimizing the health-related burden on the economy and minimum post-operative pain and hospital stay, significantly playing a role in population of the developing countries. The need of the hour is to effectively incorporate and teach this technique and provide necessary instruments to the third world countries where this luxury is scarce in order to improve the quality of the life of common man, which is most effected.

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Role and contribution of authors:
Hanan Akbar, collected the data, references and did the initial writeup.

Ajay Kumar, helped in collecting the data and also helped in introduction writing.

Zaigum Bajwa, helped in collecting the references and also helped in abstract writing.

Zain Naseer, helped in collecting the data and also helped in discussion writing.

Farrukh Bashir, helped in collecting the data and references.

Faisal Karim, helped in collecting the data and references.

Ammar Hafeez Dogar, critically review the article and made final changes.

Shahzad Javed, collected the references and also helped in material and methods writing.

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