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ORIGINAL ARTICLE

Efficacy of Discectomy by Fenestration Technique in Lumbar Radicular Pain

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ABSTRACT

Objectives: *To know the efficacy of disc excision by fenestration method for the relief of lumbar radicular pain in patients with prolapsed intervertebral disc.*

Material and Methods: *This descriptive study was conducted in the department of Neurosurgery of Hayatabad Medical Complex, Peshawar, from October 2008 to September 2010. All those patients were included in whom straight leg raising (SLR) sign was less than 60 degree and prolapsed disc at L_{4-5} or $L_5 - S_1$ levels on MRI. Patients with multiple level discs, previous history of spine surgery, central disc, evidence of lumbar stenosis and cauda equina syndrome were excluded from this study. All patients were operated in prone position under general anesthesia. Efficacy of disc excision was measured by improvement in Dennis pain scale post operatively. Findings were documented in separate semi structured proforma on the day of discharge and stored in our computer database. Statistical analysis was performed with SPSS (version 10).*

Results: *One hundred and nine patients were studied. 66 (55%) were male and 59 (45%) were female patients. Age rang was from 19 to 52 years with mean age 34.31 years. The commonest level of involvement was L_4 -L_5 in 67 (61%) followed by $L_5 - S_1$ in 42 (89%). Sixty five patients had left sided while forty four had right sided symptoms. Majority of patients presented in Dennis pain scale 4 i.e. 67% (n = 73). Twenty patients (18%) were in P_3 (Moderate pain, occasionally medications with no interruption of work or activities of daily living) and 16 patients (15%) were in Dennis pain scale 5 (Constant, severe pain; chronic pain medications) post-operatively. Complete pain relief (P_1), at the time of discharge from hospital, was achieved in 91 (83%) patients. Fourteen patients (12.26%) were in P2 and 4 (3.58%) patients in P_3 according to Dennis pain scale. No patients in this study deteriorated after surgery.*

Conclusion: *In selected patients with prolapsed intervertebral disc, surgical treatment provides quick pain relief. Fenestration with disc excision is quite a reasonable method to surgically treat the indicated cases of prolapsed disc. Fenestration offers complete visualization of nerve root and complete removal of the offending disc. This procedure does not need greater expertise, sophisticated instrumentation and techniques.*

Key words: *Prolapsed intervertebral disc, Radicular pain, Fenestration, Efficacy.*

INTRODUCTION

From adolescence to adulthood, 80 to 85% of people suffer from low back pain in the modern world. It results in tremendous loss of time and work productivity costing billions of dollars.[1] Incidence of sciatica is more than forty percent in low backache patients. However clinically significant sciatica due to prolapsed lumbar intervertebral disc is only four to six percent.[2] Lumbar disc disease forms the second most common cause for medically authorized absence from work.[3] The pain is due to the irritation of the dural covering of the nerve root by the protruded part of

intervertebral disc.[4] Pressure on the nerve root itself causes paraesthesia and numbness in the corresponding dermatome as well as weakness and depressed reflexes in the corresponding myotomes.[5] The surgical management of prolapsed lumbar disc has been practiced since Mixter and Barr1 discovered the link between sciatica and herniation of a lumbar disc in 1934. They started operating upon the patients via extensive laminectomy.[6]

Shortly afterwards Love described extradural removal of herniated disc and devised interlaminar fenestration for treatment of lumbar disc prolapse.[7] It is very safe, effective and reliable surgical technique for treating properly selected patients with herniated disc. This approach is free from spinal instability and membrane formation resulting from laminectomy.[8] The recent techniques like percutaneous lumbar disc decompression (PLDD), percutaneous endoscopic lumbar discectomy (PELD) and Young endoscopic spine system (YESS) need lots of expertise, experience and expensive equipments which are not available at every center.[9] Hence disc excision through fenestration is the procedure which can be performed by majority of neurosurgeons and orthopedic surgeons even in small peripheral centers.[4]

This study was performed to assess the results of fenestration method for disc excision through an interlaminar approach in patients in whom specific objective criteria were used to justify surgical intervention.

MATERIAL AND METHODS

This descriptive study was conducted in the department of neurosurgery of Hayatabad Medical Complex, Peshawar from October 2008 to September 2010, after prior approval from ethical committee of Hayatabad Medical Complex, Peshawar. Consent was taken from all patients.

Inclusion Criteria

One hundred and nine cases fulfilled the inclusion criteria.

All those patients were included in whom straight leg raising sign was less than 60 degree and prolapsed L_{4-5} or $L_5 - S_1$ disc on MRI.

Exclusion Criteria

Patients with multiple level discs, previous history of spine surgery, central disc, evidence of lumbar stenosis and cauda equina syndrome were excluded from this study.

Operative Procedure : Fenesteration

All patients were operated in prone position under general anesthesia. If needed, lower 3rd part of upper lamina or upper 3rd of lower lamina was cut to enlarge a fenestration for clear view.

Severity of pain was measured pre operatively by the time of admission using Dennis pain scale as is table 1.

Table 1: *Dennis Pain Scale.*

Pain Scale	Pain Description
P1:	No pain.
P2:	Occasional minimal pain; no need for medication.
P3:	Moderate pain, occasionally medications with no interruption of work or activities of daily living.
P4:	Moderate to severe pain, occasionally absent from work; significant changes in activities of daily living.
P5:	Constant, severe pain; chronic pain medications.

Efficacy of disc excision was measured by improvement in Dennis pain scale on the day of discharge from hospital. Postoperatively, follow up was treated on first postoperative day. Gradual walking was encouraged. All patients were advised a regular postoperative back exercise program after 3 weeks.

All the findings were documented in separate semi structured performa and stored in our computer database. Statistical analysis was performed with SPSS (version 10).

RESULTS

Out of 109 patients 60 were males and 59 (45%) were females (Table 2). The average age was 34.31 years ranging from 19 – 52 years.

Table 2: *Sex Incidence.*

Sex	Number	% age
Male	60	55
Female	59	45
Total	109	100

Table 3: *Level Involved.*

Level	No.	%
L_{4-5}	67	61
L_{5-S1}	42	39
Total	109	100

The most common level of involvement was $L_4 - L_5$ (n = 67) followed by $L_5 - S_1$ in 42 (39%) (Table 3). Sixty five (60%) patients had left sided while (40%) had right sided symptoms (Table 4).

Table 4: Side *Involved.*

Side	No.	%
Left	65	60
Right	44	40

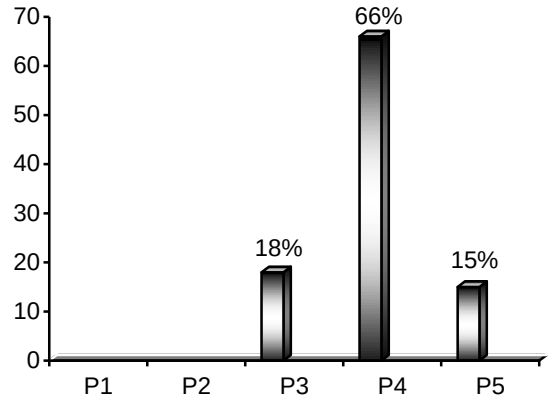

Fig. 1: *Pre-operative.*

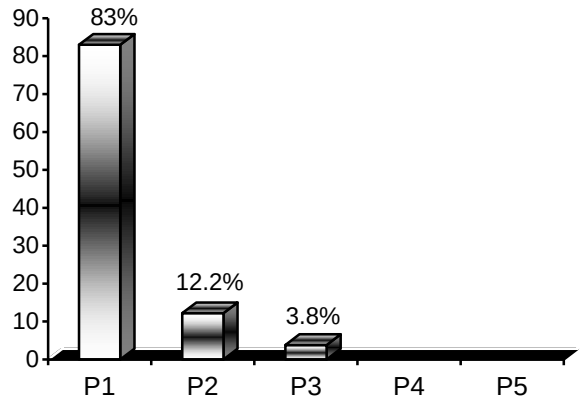

Fig. 2: *Post-operative.*

Preoperatively majority of patients presented in Dennis pain scale 4 (67%) post-operatively complete pain relief was in 9 (83%) and occasional minimal pain in 14 (12.2%) cases as shown in table and Fig. 1 and 2. No patients in this study deteriorated after surgery.

Table 5: *Pre and post operative distribution of cases according to Dennis pain scale.*

Dennis Pain Scale Pre operative			3 weeks post operative Dennis Pain Scale	
Scale	**No**	**Percentage**	**No**	**Percentage**
P1	0	0	91	83
P2	0	0	14	12.8
P3	20	18	4	8
P4	73	67	0	0
P5	16	16	0	0
Total	109	100	109	100

DISCUSSION

Recovery from sciatica makes early surgery likely to be more cost effective than prolong conservative care.[10] A Cochrain review summarized some trials evaluating surgery and chemonucheolysis for prolapsed disc, showing better results with surgery than chemonucheolysis.[11] The standard treatment of prolapsed lumber disc has been surgical excision of the disc, though the methods of discectomy vary. The traditional view has been that wide laminectomy produces increased morbidity compared to less extensive procedures like inter – laminar fenestration.[12] Hence fenestration has been done for all patients in the present study.

Dennis pain scale has been used in this study for the pain measurement. The results show that most of patients in our set up present to neurosurgeons when pain starts changing their life style (P_4).This may be because of the fact that that they don't have awareness about the nature of pain. So many of them get pain killers from Hakeems or get it from medical stores without consulting qualified doctors. Similar kind of trend can be seen in studies conducted in other parts of the country.[10]

To measure the efficacy, various parameters like Dennis pain scale, Prolo functional and economic rating scale and Visual analog scale (VAS)[4] are being

used in different studies.[4,10,13] The present study analyses the results of this surgical technique on the basis of the **Dennis pain scale**. It is a very simple method and more importantly gives the functional ability of the patient, because eventually it is the **functional outcome** that has an ultimate impact on the patient.

In our study, 83% (n = 91) patients had no pain after surgery only 3.8% (n = 4) patients had pain but that would not affect their routine life and could be relieved with simple analgesics. These findings co relate well with the data collected from other centers.[10] Fenestration is quite effective surgical technique for dissectomy, its cost effective and does not need more sophiscated instruments as composed to Microscopic or Endoscopic dissectomy which needs exclusive sophisticated instruments.[11-13]

This study, however, has got certain limitations as well. It was confined to limited number of patients with a short fallow up period. The operations were performed by different surgeons. Randomized clinical trials are needed to provide evidence based findings.

CONCLUSION

In selected patients with prolapsed intervertebral disc, surgical treatment provides quick pain relief. **Fenestration** with disc excision is quite a reasonable method to surgically treat the indicated cases of prolapsed disc. Fenestration offers complete visualization of nerve root and complete removal of the offending disc. This procedure does not need greater expertise, sophisticated instrumentation and techniques.

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