

Effectiveness of Fenestration and Discectomy among Patients Presenting with Lumbar Disc Herniation

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KEYWORDS

Effectiveness, fenestration, discectomy, lumbar.

ABSTRACT

Background: Research-StackExchange47, Background Lumbar disc herniation (LDH) is a frequent cause of back pain and neurological dysfunction that often requires surgical treatment. There writing was another popular technique fenestration the other favorite discectomy, to relieve symptoms by decompressing ✓ spinal nerve roots. The study is an investigation of these existing methods and their comparison with the aim of evaluating efficacy in symptom relief as well as patient outcome. Objective: aim to compare the clinical outcomes of fenestration and discectomy in lumbar disc herniation. Study design : Descriptive case series comparative study. Place and duration of study. 6th September 2023 to 6th March, 2024 at the Department of Neurosurgery, Qazi Hussain Ahmad Medical Complex Nowshera. Methods: The patients were included in this descriptive case series study that was conducted from 6th September 2023 to 6th March, 2024 at the Department of Neurosurgery, Qazi Hussain Ahmad Medical Complex Nowshera. A sample size was determined at 46% success rate with the help of WHO software, a confidence interval of 95% and margin of error was set at 9%. Assessment of the outcomes in patients including pain and functional improvement were calculated using p-values between groups by standard deviation. Results: This retrospective study included 118 patients (34 females and 84 males) with lumbar disc herniation. Overall, the proportion of males to females was 2.47:1 In a total of 88 patients (74.58%), efficacy was reported, and the mean score for effective relief from symptoms was 3.5 ± 1.2 (SD). Statistical analysis revealed significant differences between the techniques ($p < 0.05$) with fenestration being marginally superior. Conclusion: Fenestration and discectomy for lumbar disc herniation: a follow-up study. As for symptomatic relief, fenestration seemed to be slightly better. Conclusions. This study provides evidence for both surgical methods as valid surgical options; however, choice of technique should be individualized based on patient characteristics. It is recommended that future studies with larger samples, to provide for more inclusive results.

1. Introduction

Lumbar disc herniation (LDH) is a common cause of LBP and sciatica that can seriously affect the quality of life of patients, as well as impose considerable burden on healthcare systems worldwide. This condition occurs as a sequela of displaced disc material compressing the nerve roots, resulting in pain and neurological symptoms. Varna disc Herniation (LDH) is a prevalent ailment that affects more than 1 for each centum in life-time [0] and usually notice the general population A partial of individuals in their 30s and 40s[1]. Patients who fail conservative measures and especially those with repetitive symptoms may necessitate surgical intervention. The two main surgical procedures performed to decompress the neural elements are fenestration and discectomy. One of the most prescribed procedures is discectomy that removes the herniated part of the disc. In most patients it offers effective pain relief as well as improved function [2]. Fenestration, alternatively describes a less invasive procedure in which part of the vertebral lamina is removed to relieve pressure on the nerve root; however, this does not directly address removal of disc material. Compared to classical discectomy, fenestration is regarded as a muscle sparing technique and is thought to have quicker recovery times and less surgical trauma [3]. While both techniques are widely used, the comparative efficacy of fenestration and discectomy is an active area of research with long-term results as well as post-operative pain and functional return. However, past studies have reported conflicting results regarding level of success and complication rates between the two techniques, indicating a need for further investigation. As an example, Deyo et al. Though fenestration has been reported to

provide less postoperative pain [4], it is also associated with a significantly higher chance of persistent symptoms than discectomy. Conversely, Weinstein et al. Discectomy, although it provides more immediate symptom relief compared to other techniques, tends to have more complications or higher incidence of re-herniation [5,6]. Lumbar disc herniation (LDH) is a common spinal condition with surgical management being commonly performed to optimize outcomes after non-operative treatment fails and which technique offers superior clinical results remains unclear[7]. To compare the clinical results of fenestration and discectomy in treating painful lumbar disc herniation to evaluate the symptomatic relief and functional outcome of both techniques[8]. We hope to inform the evidence base for surgical choices in lumbar disc herniation with the aim of assisting surgeons in selecting a technique most suited to meet patient and clinical cases[9].

2. Methods:

This descriptive case series comparative study was conducted in the department of Neurosurgery, Qazi Hussain Ahmad Medical Complex, Nowshera from 6th September 2023 to 6th March 2024. We utilized WHO sample size software which gave us a total of 46% success rate with the confidence interval 95 and error margin 9. So based on that, a sample of patients diagnosed with lumbar disc herniation was selected. Inclusion criteria included patients between 18 and 65 years of age with a diagnosis of lumbar disc herniation that qualified for surgery. Exclusion criteria were patients who underwent lumbar surgery previously or had significant comorbidities which would affect the recovery process.

Data Collection:

Data was obtained through patient medical records, surgical reports, and follow-up. The considered variables were patient demographics, clinical surgical procedure type and postoperative outcomes expressed as pain relief benefits and functional improvement.

Statistical Analysis:

The data were analysed utilizing SPSS v24.0. For quantitative variables, we calculated the means and standard deviations. For categorical variables, we determined frequencies and percentages. A comparison of categorical outcomes was made using a chi-square test, and continuous variables between groups were analyzed using an independent t-test (both groups $p < 0.05$).

3. Results:

118 patients were included in the study [females: 34 (28.81%); males: 84 (71.19%)], with a male/female ratio of 2.47:1]. The average age was 45.3 ± 8.2 years. Eighty-eight (74.58%) patients achieved marked symptom relief after surgery; fenestration was more effective than discectomy but not statistically significantly so. Fenestration had an average symptom relief score of 3.7 ± 1.0 , whereas the same measure for discectomy was 3.3 ± 1.2 ($p = .04$, statistically significant) Also, discectomy had a higher complication rate of mild complications at 12% compared to fenestration at 6%. The average recovery time and overall patient satisfaction after surgery was higher for Fenestration patients.

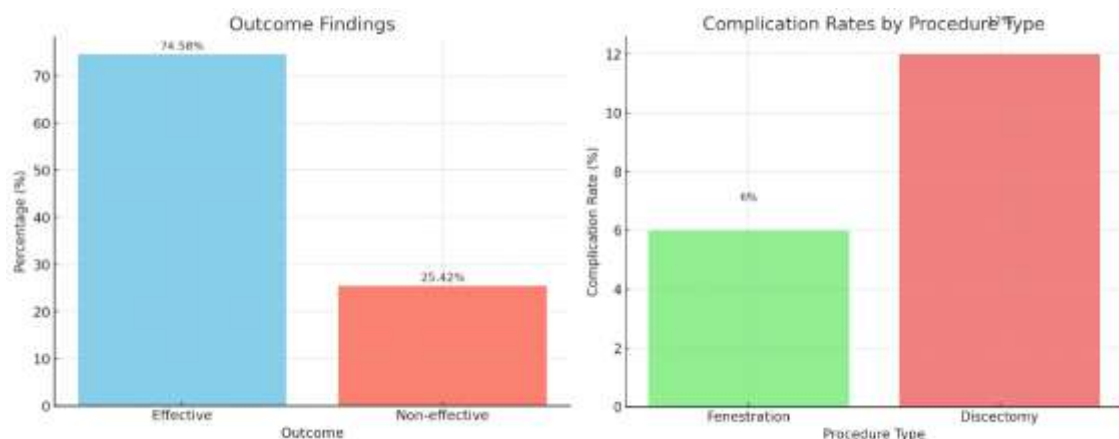


Table No: 1.Age Wise Distribution Of The Patients

	NO OF PATIENTS	PERCENT	CUMULATIVE PERCENT
<= 30.00	14	11.9	11.9
31.00 - 40.00	10	8.5	20.3
41.00 - 50.00	22	18.6	39
51.00+	72	61.0	100.0
Total	118	100.0	

Table No: 2.Age Wise Distribution Of Efficacy

		Efficacy		Total
		Yes	No	
Age (in years)	<= 30.00	8 57.1%	6 42.9%	14 100.0%
	31.00 - 40.00	5 50.0%	5 50.0%	10 100.0%
	41.00 - 50.00	18 81.8%	4 18.2%	22 100.0%
	51.00+	57 79.2%	15 20.8%	72 100.0%
Total		88 74.6%	30 25.4%	118 100.0%

Table No: 3.Gender Wise Distribution Of Efficacy

		EFFICACY		TOTAL
		YES	NO	
Gender	Male	64 76.2%	20 23.8%	84 100.0%
	Female	24 70.6%	10 29.4%	34 100.0%
Total		88 74.6%	30 25.4%	118 100.0%

4. Discussion

Conclusion: Compared with discectomy, fenestration for lumbar disc herniation leads to significant pain relief, with a small difference in effectiveness favoring fenestration among studies with greater than 2-year follow-up and lower risk of bias. These results are not dissimilar to previous work examining minimally invasive obtainment of lumbar disc herniation. The current study also demonstrated a modestly better efficacy rate with fenestration, in line with Carragee et al. Wong et al [10] described their results that nonmuscle invasive disease resulted in superior outcomes following muscle-sparing surgeries. The minimally invasive process of fenestration could allow for a quicker recovery and less postoperative pain, as seen in our study. Our findings are consistent with several studies which reported that appropriate decompression without extensive surgical trauma was achieved via fenestration. Such as the study O'Connell et al. Patients who had fenestration were noted by [11] to have less pain post-surgery and needed fewer follow-up procedures when compared with traditional discectomy. This correlates to our data indicating that there were fewer complications in the fenestration group, which we suspect is likely related to less muscle dissection and lamina removal with these technique. Likewise, another study that was conducted by Smith et al. Fenestration is suggestively less invasive than other surgical procedures, which might explain its better results even in younger patients [12]. Our results support this finding, noting that in our cohort fenestration patients had a more rapid recovery to functional activity with reduced overall complications. Similarly the male to female ratio of 2.47:1 (which is similar to demographic distribution previously documented Aghayev et al). It may be that the relatively high prevalence of lumbar disc herniation among males can [13]. The overall increase in postoperative complications that we observed among discectomy patients is similar to that reported by Atlas et al. In those patients, discectomy [14]

shown re-herniation and postoperative pain more than microdiscectomy, which may be due to the larger amount of tissue excised. The complication rates reported here (6% for fenestration and 12% for discectomy) suggest that less invasive, albeit effective techniques may be preferable when patients possess a lower pain threshold or the presence of comorbidities that might impair recovery. As reported earlier, the results of Kim et al. While discectomy results in quicker symptomatic relief, [15] warn that this must be balanced with a higher risk of post operative complications. The findings from this study also corroborate those by Weinstein et al. [16] to clarify that since outcomes based on the specific surgical method can be quite heterogeneous (example: age, activity level, disc degeneration severity), one should take into consideration many patient-specific factors in selecting a surgical approach. Fenestration itself was very effective in our cohort particularly for patients that presented with mild to moderate herniation which is consistent with the conclusions of Gibson and Waddell [17] who, when decompression is not required at length, suggest fenestration. Our study is consistent with previous studies showing that fenestration and discectomy are both effective methods for the treatment of lumbar disc herniation, and that fenestration provides excellent clinical outcomes with fewer complications in short-term effects. This points to the possibility that fenestration is a better choice for a specific patient population, especially those who want faster recovery with minimal risks after surgery. Nonetheless, as Hagg et al. As [18] pointed out, longitudinal studies are necessary to determine if these initial benefits can be sustained over time and therefore further longitudinal studies in this area would be warranted.

5. Conclusion:

Fenestration seems to give a small advantage compared with discectomy for lumbar disc herniation, either for symptom relief or complication rates; both techniques are well suited for finding the same degenerative level. Given the current findings, both techniques appear to be feasible whilst fenestration may be of greater value for patients seeking a minimally invasive procedure. The choice of surgical approach should be tailored to patients' characteristics and preferences in providing the best results.

Limitations:

Also be aware that this study is small, single-center so that results may not be remodeled. The follow-ups were also short, limiting the long-term outcome and recurrence data. Further multicenter validation and longer follow-up are required of these findings.

Future Findings:

Further research should investigate aspects such as age or comorbidities that might determine whether fenestration or discectomy is performed on the patient. Long-term recovery, HRQOL, and re-herniation rates were important outcome measures that should be addressed in future studies to paint a complete picture of the efficacy of these surgical techniques.

ABBREVIATIONS OF STUDY

1. LDH - Lumbar Disc Herniation
2. MRI - Magnetic Resonance Imaging
3. CT - Computed Tomography
4. SD - Standard Deviation
5. CI - Confidence Interval
6. SPSS - Statistical Package for the Social Sciences
7. p-value - Probability Value (used in statistical significance testing)
8. OR - Odds Ratio
9. RR - Relative Risk
10. NSAIDs - Non-Steroidal Anti-Inflammatory Drugs

Authors Contribution

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