

Impact Of Lumbar Pedicular Screw Fixation And Postero-Lateral Fusion On Recurrence Rates In Cases Of Primary Lumbar Disc Prolapse

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Citation

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Abstract

Background: Patients suffering from a lumbar herniated disc will typically present with signs and symptoms consistent with radiculopathy. The surgical alternative of choice remains a lumbar discectomy, but fusions have been performed for both primary and recurrent disc herniations.

Aim: In our study we are providing our experience to evaluate the impact of trans-pedicular screw fixation and postero-lateral lumbar spine fusion on the recurrence rates of lumbar disc herniation.

Methods: A retrospective study on 45 patients with primary lumbar disc prolapse presented with typical radiculopathy.

Results: Out of 45 patients, 20 patients (Group A) underwent simple classic discectomy via fenestration or laminectomy. For the other 25 patients (Group B), we performed additional postero-lateral fixation and fusion with rods, screws and bone graft. In our study the rate of recurrence of disc prolapse was much reduced by posterolateral fixation and fusion with a radiological preserved disc height. Fixation does not only prevent recurrence of discectomy but it alters the degenerative process and maintains lumbar stability.

Conclusion: Simple lumbar discectomy remains the surgery of choice for lumbar disc prolapse, however, our study proves that lumbar fixation and fusion along with lumbar discectomy reduces the incidence of recurrence of disc prolapse and of lumbar instability.

INTRODUCTION

Patients suffering from a lumbar herniated disc will typically present with signs and symptoms consistent with radiculopathy. They may also have low-back pain, however, the source of this pain is less certain, as it may be from the degenerative process that led to the herniation. The surgical alternative of choice remains a lumbar discectomy, but fusions have been performed for both primary and recurrent disc herniations. In the original guidelines, the inclusion of a fusion for routine discectomies was not recommended. (1)

The therapy of a disc prolapse with accompanying degenerative changes is subject to controversial discussion (2,3,4). On the one hand, segmental fusion leads to an irreversible loss of function of the treated segment with the

resulting risks of adjacent segment degeneration and pseudarthrosis, whereas a simple nucleotomy is not able to stop the continuing segmental degeneration but can even cause an acceleration of this process (5,6,7). The reduction of the intradiscal pressure, and the surgically induced alteration of osseous and ligamentous structures after discectomy combined with the simultaneously nearly missing potential of healing of the intervertebral disc and the adjacent endplates, leads to progressive instability (8). Thus, beside the successful symptomatic treatment, the aim of the surgical treatment should be the permanent inhibition of the progression of the degeneration with extensive preservation of the function of the affected segment (9).

In our study we are providing our experience to evaluate the impact of trans-pedicular screw fixation and postero-lateral

lumbar spine fusion on the recurrence rates of lumbar disc herniation.

METHODS

A retrospective study on 45 patients with primary lumbar disc prolapse presented with typical radiculopathy.

Inclusion Criteria: Patients 20-50 years of age, clinical presentation with radiculopathy, MRI findings of 1ry lumbar disc prolapse correlating with the clinical findings, and postoperative complete resolution of presenting radicular pain.

Exclusion Criteria: Patients older than 50 years, clinically and radiologically insignificant disc prolapse, recurrent disc prolapse.

Out of our 45 patients, 20 have underwent simple lumbar discectomy via laminectomy or fenestration alone, and 25 patients have underwent discectomy with posterolateral fusion and transpedicular screw fixation.

Postoperative Clinical and radiological data are collected to evaluate the incidence of recurrence of radiculopathy or recurrence of disc herniation or development of spinal instability after the period of 3-5 years.

RESULTS

Out of 45 patients, 20 patients (Group A) underwent simple classic discectomy via fenestration or laminectomy. For the other 25 patients (Group B), we performed additional postero-lateral fixation and fusion with rods, screws and bone graft.

During 3-5 years, our patients were evaluated during routine follow up in the out patient clinic.

From Group A, 14 patients (70%) showed no evidence of recurrence neither clinical nor radiological while 6 patients (30%) presented with a significant recurrence of symptoms (P value 0.042), 2 of which (10%) required redo-surgery and the other 4 (20%) were satisfied with medical treatment. 3-5 years post operative radiology showed reduction in disc height in 12 patients (90%) and patients with recurrence symptoms showed radiological significant recurrence of disc prolapse (P value 0.032). 4 patients from those with recurrence of symptoms showed radiologically significant signs of instability (P value 0.038) in the form of antero- or retro-lithesis of the involved lumbar vertebrae.

From Group B, 24 patients (96%) did not show any

symptom of recurrence and their radiology showed preserved disc height, with adequate fusion. However one patient who was an obese middle-aged lady developed severe back pain and recurrence of radiculopathy due to inadequacy of fusion and failure of fixation system with the development of adjacent segment disc prolapse and required redo-surgery for the discectomy and fixation. This was found to be statistically insignificant rate of recurrence (P value 0.783)

Figure 1

A Preoperative MRI LSS of a case of L5-S1 denovo lumbar disc prolapse presented with back pain and left sciatica. The case was managed among group B.

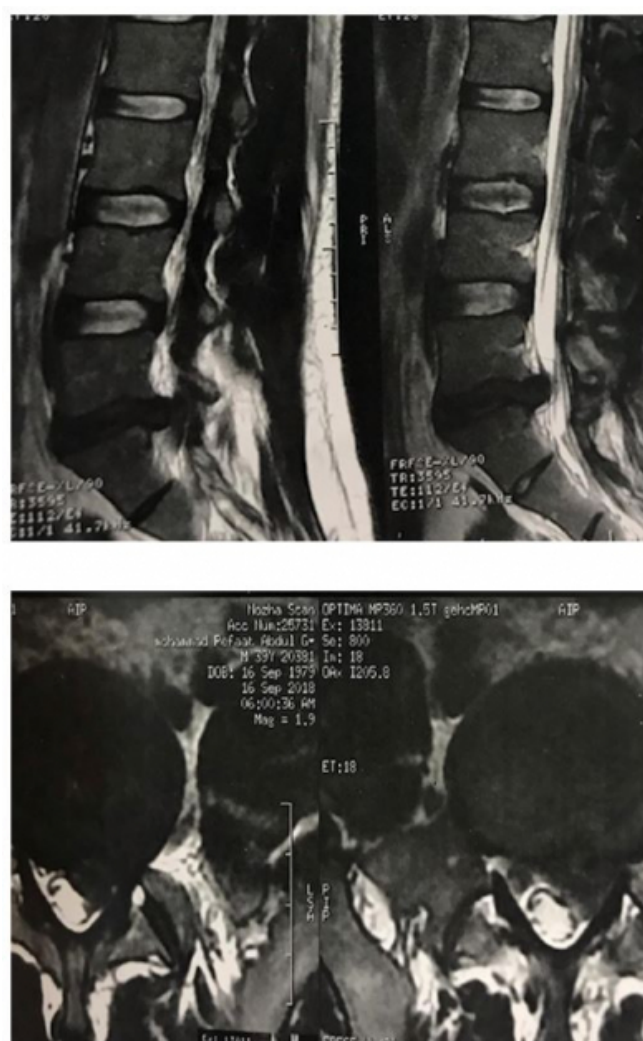
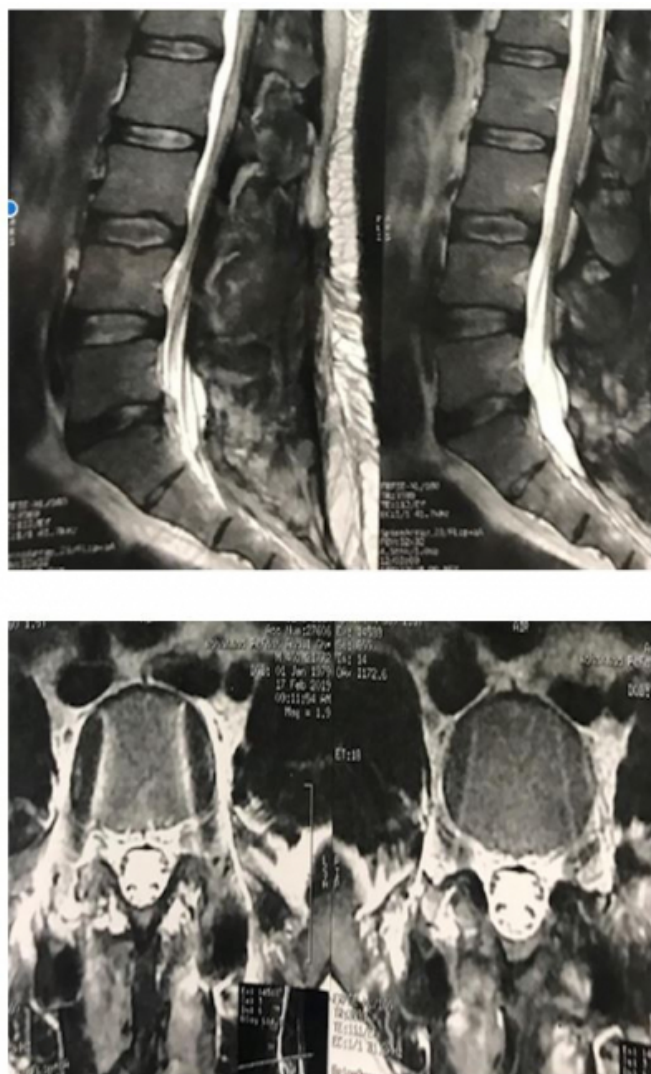


Figure 2

Post Op MRI LSS of the case in Fig. 1, showing successful L5-S1 discectomy with posterolateral fixation and fusion.



DISCUSSION

Simple discectomy is not able to stop the continuing segmental lumbar degeneration but can even cause an acceleration of this process (6). The reduction of the intradiscal pressure, and the surgically induced alteration of osseous and ligamentous structures after discectomy combined with the simultaneously nearly missing potential of healing of the intervertebral disc and the adjacent endplates, leads to progressive instability (8). Beside the successful symptomatic treatment, the aim of the surgical treatment should be the permanent inhibition of the progression of the degeneration with extensive preservation of the function of the affected segment (9).

The results of disc excision alone versus disc excision with

fusion have been compared by several investigators. Young and Love (10), Barr (11) and Vaughan et al (12) have reported that concomitant lumbar fusion at the time of disc excision yields better results by providing adequate bony decompression with a maintained stability that reduces rates of recurrence. In contrast, Nachlas (13), Frymoyer et al (14), Eie (15), and White et al (16) have reported that fusion is rarely indicated because satisfactory results can be obtained by disc excision alone.

In our study the rate of recurrence of disc prolapse was much reduced by posterolateral fixation and fusion with a radiological preserved disc height. Fixation does not only prevent recurrence of discectomy but it alters the degenerative process and maintains lumbar stability. Younger, highly active patients with proplased lumbar discs should be offered lumbar fusion along with discectomy, it will have a significant effect on the quality of their lives by reducing the risk of recurrence and instability. Although more invasive and more expensive, however on the long term it has a better outcome than simple discectomy alone.

We can agree that a more simple procedure like discectomy or fragmentectomy alone can have a faster recovery, and more important, an immediate improved presenting symptom which makes it a good choice for a neurosurgeon, however, our study proves that a long term better quality of life comes with lower recurrence rates, as patients with recurrence symptoms will require long term unsatisfactory medical treatment or a more risky redo surgeries with higher morbidities.

CONCLUSION

Simple lumbar discectomy remains the surgery of choice for lumbar disc prolapse, however, our study proves that lumbar fixation and fusion along with lumbar discectomy reduces the incidence of recurrence of disc prolapse and of lumbar instability.

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