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Assessment of the functional outcome of multiple discs prolapses treated with discectomy and surgical stabilization in tertiary care hospital in Salem district

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ABSTRACT

Background: Low back pain affect up to 80% of people in the modern world at some point in their lives, creating high rates of activity limitation, work absence, impaired quality of life, and the need for medical care. To assess the functional outcome of patients with multiple discs prolapses treated with discectomy and surgical stabilization.
Methods: A longitudinal study was conducted in the orthopedics department of Vinayaka missions Kirupananda Variyar medical college, Salem for two years between August 2019 and July 2020. A total of 30 patients presenting with lumbar disc herniation with radiculopathy and neurological deficits were included in the study. The diagnosis was confirmed by doing an X-ray and MRI of the lumbosacral spine. Patients were followed up for 6 months and the nature of the pain was assessed post-operatively using the Japanese orthopedic association system scoring for low back pain. It ranges from 0-15. Score 0 is the worst pain and 15 is normal.
Results: The mean Japanese association score for low back pain was 7.2 before the surgical procedure and it was 12 after the procedure and the difference was found to be statistically significant. Among the postoperative complications, 4 patients developed failback syndrome and 1 patient had implant failure.
Conclusios: Relief of radicular pain was associated with subjective satisfaction with the surgery among our study population, as evidenced by the decrease in radicular pain and the subjective satisfaction with the operation.

Keywords: Straight leg rise, Intervertebral disc prolapse, Extensor hallucis longus, Japanese score

INTRODUCTION

Lumbar disc herniation is a common cause of low back and radicular leg pain that tends to improve spontaneously over time. Symptomatic lumbar disc herniation occurs in up to 2% of the general population at some point in life.[1] Men are affected more than women, with a peak incidence in the fourth and fifth decade of life. The intervertebral disc (IVD) primarily serves to distribute the forces exerted during axial loading of the spinal column; yet allowing motion in the otherwise rigid column.[2] The IVD consists of the gelatinous nucleus pulposus surrounded by the fibrous annulus fibrosus and the cartilaginous plates. [3]The normal aging process results in reduced water content in the IVD, reducing its capability to cope with mechanical forces. Eventually, with repeated episodes of high stress, annular fissures occur; with resultant protrusion (contained), extrusion (non-contained), or sequestration of the nucleus pulposus.[4] Most herniations are located postero-laterally, and when this occurs, the ipsilateral nerve root is compressed at its exit from the dural sac; giving rise to radiculopathy along with the distribution of that nerve. More dramatically but rarely, when the herniation is central, the cauda-equina is compressed resulting in the cauda-equina syndrome.[5] A majority of the patients suffering from lumbar disc herniation experience a positive natural history and respond well to conservative

treatment, but a certain amount of patients are referred to surgery if conservative treatment has failed.[6] Some clinicians claim that surgical intervention in the management of lumbar disc herniation could be avoided if only continue conservative management for a longer period before considering surgery. In the contrast, it is known that a long-lasting period of pain can lead to functional restriction, anxiety, and depression.[7] Recently, outcome-based on patients' satisfaction with treatment or patients´ health-related quality of life after surgery has become popular. Surgical treatment of symptomatic lumbar disc herniation has been reported to have a high success rate (70-95%), evaluated by validated outcome scores and patient's satisfaction.[8] The outcome for surgically treated patients compared to conservative treated patients has been demonstrated to be superior at short-term follow-up (up to 1 year) but no differences have been demonstrated between treatments at long-term follow-up.[9]

METHODS

A longitudinal study was conducted in the orthopedics department of Vinayaka Missions Kirupananda Variyar medical college, Salem for two years between August 2019 and July 2020. A total of 30 patients presenting with lumbar disc herniation with radiculopathy and neurological deficits were included in the study. The diagnosis was confirmed by doing an X-ray and MRI of the lumbosacral spine. Anesthetist opinion was obtained for all the patients who were posted for surgery. Discectomy, laminectomy, and spinal fusion with posterior stabilization are the procedures done for patients with disc prolapse. Patients were followed up for 6 months and the nature of the pain was assessed post-operatively using the Japanese orthopedic association system scoring for low back pain. It ranges from 0-15. Score 0 is the worst pain and 15 is normal.

Inclusion criteria

Patients of age from 18 to 70 years. All symptomatic patients having painful radiculopathy with neurological deficits. Patients with claudication pain. Persistence of pain after 6 weeks of conservative management, spinal instability, two or more affected segments were included in the study.

Exclusion criteria

Single affected segment, infection, non-degenerative causes like (e.g., Trauma and congenital deformity), tumor, Metabolic bone disease, patients with a previous history of surgery were excluded from the study.

The study was conducted after getting clearance from the institutional ethical committee and informed consent from the patients. All the routine blood and urine investigations were done and the diagnosis was confirmed by doing an X-ray and MRI of the lumbosacral spine. Anesthetist opinion was obtained for all the patients who were posted for surgery. After a 12hour fast the patient was posted for surgery and the following steps were followed in doing the surgical procedure- After the administration of general anesthesia, the patient is placed prone on the spinal frame. This positioning works best in that the intra-abdominal pressure is decreased with the resultant decreased venous pressure and bleeding in the epidural plexus. Hypotensive anesthesia has also aided in reducing blood loss. Also, at least two units of blood are kept in hand. Levels of the disc were identified with the help of a needle and checked under the c-arm.

Statistical analysis

Data entry was made in the Microsoft excel software in codes and analysis was done with an SPSS-20 computer package. Categorical variables are expressed as percentages whereas continuous variables are expressed as mean±standard deviation. Association between the categorical variable was found by the chi-square test and the relationship between the continuous variable was assessed by student's t-test.

RESULTS

Table 1 shows the age-wise distribution of the study subjects. It is seen from the table that the majority of the study subjects are in the age group between 50 and 70 years and the mean age was 53.5 years. gender-wise distribution of the study subjects. It is seen from the table that the majority of the patients are males and the male: female ratio was 1.5:1.

Table 1: Age wise distribution of the study subjects.

Age (years)	Frequency	Percentage (%)
30-40	2	6.6
41-50	4	13.3
51-60	14	46.6
61-70	10	33.3
Total	30	100

Table 2: Distribution of the study subjects based on the mode of onset of low back pain.

Mode of onset of pain	Frequency	Percentage (%)
Sudden onset	9	30
Insidious onset	21	70
Total	30	100

Table 2 shows the distribution of the study subjects based on the mode of onset of low back pain. It is seen from the table that for 70% of the patients with low back pain the onset was insidious.

Table 3 shows the distribution of the study subjects based on the presence of radicular pain. It is seen from the table

that 90% of the patients with low back pain had radicular pain.

Table 3: Distribution of the study subjects based on of the presence radicular pain.

Radicular pain	Frequency	Percentage (%)
Present	27	90
Absent	3	10
Total	30	100

Table 4: Distribution of the study subjects based on the type of gait.

Type of gait	Frequency	Percentage (%)
Antalgic gait	25	83.3
Normal	5	16.7
Total	30	100

Table 4 shows the distribution of the study subjects based on the type of gait. It is seen from the table that 83.3% of the study subjects had antalgic gain and for the remaining the gait was normal.

Table 5: Distribution of the study subjects based on the complaint of numbness.

Complaint of numbness	Frequency	Percentage (%)
Present	28	93.3
Absent	2	6.7
Total	30	100

Table 5 shows the distribution of the study subjects based on the complaint of numbness in both legs. It is inferred from the table that 93.3% of the study subjects had a complaint of numbness.

Table 6: Distribution of the study subjects based on the presence of rest pain.

Rest pain	Frequency	Percentage (%)
Present	24	80
Absent	6	20
Total	30	100

Table 6 shows the distribution of the study subjects based on the presence of rest pain. It is seen from the table that 80% of the patients with low back pain had the complaint of pain during rest and for the remaining 20% the pain was experienced only during walking.

Table 7: Distribution of the study subjects based on the people using NSAID'S for pain relief.

NSAID's	Frequency	Percentage (%)
Used	29	96.6
Not used	1	3.4
Total	30	100

Table 7 shows the distribution of the study subjects based on the people using NSAIDs for pain relief. Nearly 97% of the patients were using NSAIDs for their pain relief and most of them had the habit of taking the tablets from over the counter without consulting the doctor.

Table 8: Distribution of the study subjects based on the people used traction for pain relief.

Traction	Frequency	Percentage (%)
Used	25	83.3
Not used	5	16.7
Total	30	100

Table 8 shows the distribution of the study subjects based on the people who used traction for pain relief. It is inferred from the table that 83.3% used traction for their pain relief at a physiotherapy center.

Table 9: Distribution of the study subjects based on the presence of lumbar lordosis in clinical examination.

Lumbar lordosis	Frequency	Percentage (%)
Present	22	73.3
Absent	8	26.7
Total	30	100

Table 9 shows the distribution of the study subjects based on the presence of lumbar lordosis in clinical examination. It is seen from the table that nearly 75% of the study subjects had lumbar lordosis during their spine examination. Of the study subjects based on the presence of spine tenderness in clinical examination. It is inferred from the table that 43.3% of the study subjects experienced spine tenderness during the clinical examination of the spine.

Table 10: Distribution of the study subjects based on the Japanese orthopedic association score for low back pain before operation.

Score	Frequency	Percentage (%)	Mean±SD
6	5	16.6	7.2±0.71
7	14	46.6	
8	11	36.6	
Total	30	100	

Table 10 shows the distribution of the study subjects based on the Japanese orthopedic association score for low back pain before operation. The Japanese orthopedic Association score for low back pain includes four components namely straight leg raising test, low back pain, sensory disturbance, and motor disturbances. The total score ranges from 0-15. Lower scores indicate that patients are having pain with neurological deficits and the higher score indicates an improvement in pain and neurological deficits. It is inferred from the table that the mean score before the operation was 7.2. the distribution of the study

subjects based on postoperative complications. It is seen from the table that the most common postoperative complication was failback syndrome and only one patient had implant failure and one patient had a mild superficial infection which was cured by administering I. V. antibiotics.

DISCUSSION

Degenerative disc disease and disc hernias are the most common problems in patients with low back pain and one of the most common causes of work left [10] Nevertheless, the treatment of disc hernias is very controversial and there is a multitude of studies that present contradictory conclusions. For example, the results published by Ng et al reported that prolonged conservative treatment has outcomes after four years of follow-up similar to those achieved through early surgery. After this, several observational cohort studies were conducted that presented worse results from conservative treatment as compared to early surgery. They concluded that, after two months of sciatica, outcomes from conservative treatment are worse than those from surgical intervention.[11] All of these results must be viewed with caution because the studies were not based on randomized populations and included patients who did not receive the same analgesic regimens or follow the same recommendations, making the outcomes not comparable.[12] However, we must keep in mind that it is difficult to make patients with persistent sciatica wait for 8-12 months of conservative treatment.[13] The prevalence of leg and back pain in the general population is very high. It is said that above 50% of the population has back pain during their lifetime.[14] It is the cause of considerable disability and loss of work resulting in economic hardship to the patients. The results of conservative treatment were not satisfactory and sustained. It is prolonged and costly in a proven case of intervertebral disc prolapse in the lumbar region. Removal of the disc brings about considerable relief of symptoms.[15] In this study, L4-L5 disc was maximally involved (63%) followed by L5-SI (22%), L3-L4 and L2-L3 disc were minor contributions.[16] Out of these, 80% of patients had neurogenic claudication. Regarding clinical findings and surgical corroboration, the weakness of extensor hallucis longus was found to be 90% correlating with L5 root involvement. L5 sensory deficit was found to be strong evidence of L4-L5 level prolapse. Sensory involvement in the SI dermatome was found in both L5-SI and L4-L5 prolapse. So, SI sensory changes require full interpretation.[17] The unilateral absence of ankle jerk was fully consistent with SI nerve root involvement and L5-SI disc prolapse. Knee reflexes were diminished only in high lumbar disc prolapse.[18] The most common plain X-ray findings were a reduction in disc space and obliteration of lumbar lordosis. The list of spines helped to know the type of disc prolapsed whether auxiliary or shoulder. This was 80% consistent with diagnostic study and surgery.[19] Another part of the study was to know the accuracy of diagnostic studies about per operative findings. But, most of the patients were done with MRI investigations, so a comparison between MRI CT scan and Myelogram may not be accurate. MRI is found to be 100% sensitive in demonstrating disc prolapses.[20] The nerve root involvement as revealed by imaging study was compared with surgical findings. Myelogram showing Root compression or cut-off has the highest correlation. MRI ranks second and CT could not give exact details about nerve root compression in many cases.[21] In this study, there were more patients with a duration of symptomless than 2 years. In the final assessment of pain relief and neurological deficit improvement, this was found to pose significance. With a duration of fewer than 6 months, there were 60% good results in the follow-up. This may be because there were no secondary changes in the facet joints, but in those with more than 2 years, there were 20% of poor results. This indicates that the duration of the disease should be taken into consideration in planning treatment. The quality of relief of pain was noted to get increased with time. The 5% good result within 10 days, 54% good results within 3 months, and 81% good results within 6 months. 5% of patients show no pain relief after 3 months or fresh pains after 3 months.[22] From all these results, we can conclude that early surgery (a clinical history of sciatica for 6-12 weeks) does not lead to better long-term results. The only benefits are a faster decline of radiculopathy and an earlier recovery. This, however, can be considered a valuable advantage for the part of the population that is unable to, unwilling to, or cannot wait for the natural course of the disease or the possibility of a delayed surgery if necessary.[23] The general recommendation is to wait for a period of 6 to 12 weeks after the onset of symptoms, except in cases of cauda equine or rapid loss of motor function. However, taking all the studies into account, perhaps we should rethink this indication because in our study we excluded patients who had undergone surgery after less than 6 months of progression.[24] Semirigid fixation is the most commonly used term to describe these devices, a questionable concept and one we do not share since dynamic systems do not produce fusion. Dynamic stabilization is used to eliminate lumbar pain and stabilize degenerated discs. These systems enable a more physiological transmission of forces between the anterior and posterior components of the lumbar spine while maintaining mobility and controlling abnormal movements in the lumbar segment. These semi-rigid stabilization systems restore normal spine functions and protect the adjacent segments. In our review, there was only one case of degeneration of the adjacent disk.[25]

CONCLUSION

The present study proves that there was a statistically significant improvement in the low back pain, sensory function, motor function, and straight leg raising test which was assessed using Japanese orthopedic score after discectomy and surgical stabilization. 83% of the study subjects did not have any kind of serious complications. Only one patient out of 30 had implant failure and four patients had failback syndrome. Proper selection of cases and proper procedure in expert hands bring rewarding

benefits for patients by laminectomy and discectomy with posterior stabilization in proved cases of multi-level lumbar intervertebral disc prolapses. Relief of radicular pain was associated with subjective satisfaction with the surgery among our study population, as evidenced by the decrease in radicular pain and the subjective satisfaction with the operation.

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