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Original Research Article

An Outcome Assessment of Surgical Management in Lumber Disc Spine: An Observation Study

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Abstract

Aim: The aim of the present study was to evaluate the surgical outcome in the treatment of Lumber Disc Prolapse (LDP).

Methods: The present study was conducted in the Department of Orthopaedics, IGIMS, Patna, Bihar, India from December 2016 to November 2017 and 50 patients were selected.

Results: Mean follow-up time of our study was 36.50 ± 15.60 months (minimum 12 months). Mean preoperative VAS for radicular pain and low back pain were 9.18 ± 1.89 (standard deviation [SD]) and 6.90 ± 4.31 SD, respectively. Mean preoperative VAS for back pain was higher in women than men. The mean age of the patients were 44.18 ± 10.50 years ranging from 26-70 years. The mean age of the male patients was 38.5 ± 13.5 years and a female patient was 39.8 ± 16.2 years. Though the mean age of the female patients a little bit higher than the male, but the mean difference was not statistically significant ($p>0.05$). Data indicated that maximum number of the patients was in age group >40 years (40%) followed by 30% in the age group 21-30 years, 26% in the age group 31-40 years and 4% were in the age group <20 years. Out of 50 patients, 23 (46%) had disc prolapse at level L4-L5, 12 (24%) had at L5-S1, 5 (10%) had L1-L2, 3 (6%) patients had disc herniation at L2-L3 and 6 (12%) had at L3-L4.

Conclusion: Regarding the subjective assessment of current study patients, it was observed that most (75%) of the patients had excellent functional outcome, 15% good, 7% fair and 3% had poor functional out-come according to modified Macnab criteria.

Keywords: Lumbar Disk Herniation, Surgery, Outcome, Predictors.

Introduction

Sciatica resulting from a lumbar intervertebral disc herniation is the most common cause of radicular leg pain in adult working populations. [1] Such patients have a favorable natural history associated with resorption of extruded disc material, but surgical treatment is frequently considered and performed in those with persistent or severe symptoms. [2] In recent years, the number of lumbar spinal surgeries has been increasing, leading to increased use of medical resources, including both surgery and nonsurgical treatments such as exercise, medication, physiotherapy, and other interventions. [3,4] Lumbar disc herniation (LDH) accounts for approximately two-thirds of spinal pain diagnoses, and many studies have examined the optimal utilization of medical resources. [5,6] Many prospective studies have compared the effectiveness of surgery versus

nonsurgical interventions. Although surgery has shown better outcomes in the short- or mid-term [7,8], the effect of surgery does not always last over the long term. [9] A systematic review of accumulated evidence led to the conclusion that surgery resulted in faster relief of symptoms, but the ultimate long-term outcomes were similar between non-surgery and surgery groups. [10]

Prolapsed lumbar intervertebral disc (PLID) is an important cause of low back pain and it is one of the frequent cause of disability. Its frequency and annual tool of suffering and disability has been a constant stimulus for investigation in developed countries. Furthermore in Bangladesh a large number of people of working age are suffering from low back pain due to prolapse lumbar inter-vertebral disc. When conservative management fails, surgery is the only way to treat these patients and different surgical procedures are there. Microdiscectomy, Endoscopic discetomy, Laser discectomy is the operation of developed countries. The prolapsed intervertebral disc is usually seen in fit adults bet-ween the ages of 20 and 45, but they can also occur below the age of 20 years and elderly. Males suffer more from interverebral disc prolapse than females. Almost in 80% of cases, the protrusion is traumatic in origin and there is either a history of sudden severe strain due to heavy weight lifting or patients occupation is one in which flexion strain must be resisted, such as packer, fireman, porter, etc. [11] The standard procedure for disc removal was total laminectomy followed by a transdural approach to the disc. In 1939, Semmes presented a new procedure to remove the ruptured intervertebral disc that included subtotal laminectomy and retraction of the dural sac to expose and remove the ruptured disc with the patient under local anaesthesia. [12] Finally through the anatomic dissections and clinical observations, spinal ageing and the development of pathologic process associated with or complication the process of ageing have evolved as a primary theory in disc disease. [13] The aim of the present study is to evaluate the surgical outcome in the treatment of Lumber Disc Prolapse (LDP).

Methods

The present study was conducted in the Department of Orthopaedics, IGIMS, Patna, Bihar, India from December 2016 to November 2017 and 50 patients were selected and 40 patients were selected. Moreover, following variables were studied for clinical evaluation Level of involvement, side of involvement, X-ray of lumber spine, MRI of lumbar spine, Relief of rediculopathy, Gait, straight leg raising (SLR), muscle power, sensory deficit, Complications: Root injury, dural tear, discitis, Functional outcome variables: Pain status, relief of presenting symptoms, mobility of spine, return to work, level of activity. Data were collected, complied and tabulated according to key variables. The analysis of different variables was done according to standard statistical analysis by using SPSS. A total of 50 patients with prolapsed lumbar intervertebral disc were operated and followed up routinely. The main objective of the study was to evaluate the prognosis of management of prolapsed lumbar intervertebral disc by laminotomy and discectomy.

Inclusion criteria

- Signs of root compression-Sensory, Motor, Reflex.
- Deteriorating signs and symptoms of patients of PLID where leg pain is dominant than
- back pain
- Restricted straight leg raising test with Positive MRI findings refractory to 2-3 weeks of conservative treatment.

Exclusion criteria

- PLID associated with other spinal pathology e.g. spinal tumor, infection, inflammation etc.
- Repeat lumbar disc surgery due to recurrence of symptoms.
- PLID due to direct trauma with fracture-dislocation of vertebra.
- PLID with Cauda-equina Syndrome

Results

Table 1: Patient data

Sociodemographic characteristics	
Mean age at the time of surgery, y ± SD (range)	44.18 ± 10.50 (26–70)
Sex	
Males	30
Females	20
Age groups in years	
<20 years	2 (4)
21-30 years	15 (30)
31-40 years	13 (26)
>40 years	20 (40)
Sex distribution for different surgical methods	
Laminectomy	26
Osteotomy	14
MAPN	10
Preoperative symptoms and duration	
Duration from onset of symptoms to time of surgery (mo)	
<1	35%
1–6	30%
6–12	20%
>12	15%
Level of disk herniation	
L1-L2	5
L2-L3	3
L3-L4	6
L4-L5	23
L5-S1	12

Mean follow-up time of our study was 36.50 ± 15.60 months (minimum 12 months). Mean preoperative VAS for radicular pain and low back pain were 9.18 ± 1.89 (standard deviation [SD]) and 6.90 ± 4.31 SD, respectively. Mean preoperative VAS for back pain was higher in women than men. The mean age of the patients were 44.18 ± 10.50 years ranging from 26-70years. The mean age of the male patients was 38.5 ± 13.5 years and a female patient was 39.8 ± 16.2 years. Though the mean age of the female patients a little bit higher than the male, but the mean difference was not statistically significant ($p>0.05$). Data indicated that maximum number of the patients was in age group >40 years (40%) followed by 30% in the age group 21-30 years, 26% in the age group 31-40 years and 4% were in the age group <20 years. Out of 50 patients, 23 (46%) had disc prolapse at level L4-L5, 12 (24%) had at L5-S1, 5 (10%) had L1-L2, 3 (6%)

patients had disc herniation at L2-L3 and 6 (12%) had at L3-L4.

Table 2: Final outcome

Final outcome	N%
Excellent	35 (70)
Good	7 (14)
Fair	6 (12)
Poor	2 (4)

All the patients were examined for straight leg raising (SLR) on supine position. Preoperatively, the SLR was 42.6 ± 6.3 degree. However, following operation the SLR significantly improved from baseline 89.3 ± 2.6 at 3rd visit. Subjective assessment of patients indicated that majority (70%) had excellent function outcome followed by 14% had good functional outcome and (12%) had fair outcome. However, (4%) of patients had poor functional outcome.

Discussion

A disc herniation is the term given to any uneven out-pouching or bulging of the posterior region (back region) of the intervertebral disc as seen on MRI. The bigger the lumbar/sacral disc herniation, the more likely it is to cause back and/or leg pain--the later of which is called sciatica. [14] Though low back pain and sciatica had affected the human race since time immemorial, until the first quarter of previous century, little knowledge had been acquired about the ways in which the intervertebral disc might cause compression on intra-spinal neural structures.

Mean follow-up time of our study was 36.50 ± 15.60 months (minimum 12 months). Mean preoperative VAS for radicular pain and low back pain were 9.18 ± 1.89 (standard deviation [SD]) and 6.90 ± 4.31 SD, respectively. Mean preoperative VAS for back pain was higher in women than men. The mean age of the patients were 44.18 ± 10.50 years ranging from 26-70 years. The mean age of the male patients was 38.5 ± 13.5 years and a female patient was 39.8 ± 16.2 years. Though the mean age of the female patients a little bit higher than the male, but the mean difference was not statistically significant ($p>0.05$). Data indicated that maximum number of the patients was in age group >40 years (40%) followed by 30% in the age group 21-30 years, 26% in the age group 31-40 years and 4% were in the age group <20 years. Out of 50 patients, 23 (46%) had disc prolapse at level L4-L5, 12 (24%) had at L5-S1, 5 (10%) had L1-L2, 3 (6%) patient had disc herniation at L2-L3 and 6 (12%) had at L3-L4. Low back pain commonly afflicts the adult population all over the world. It is of prime importance that the cause of low back pain is diagnosed in its early stage since not all cases are innocent. [15] The syndrome where the diagnosis is not in doubt is when root pain extends below the knee (radiculopathy) [16] The commonest cause of radicular pain is lumbar disc prolapse. Prior to embarking on surgery for a lumbar disc prolapse it should be recalled that the long-term natural history for such a patient is likely to be good and that many radiologically proven discs may become or remain asymptomatic. [17,18] Moreover, the outcome of surgical therapy for lumbar disc prolapse was compared to conservative therapy, at six months there was no statistical difference between the two groups. [19]

By seven years follow up the surgically treated group had fair better, only in that they had had less episodes of low back pain and had lost less time from work. In a similar study, it was found that at one year

the surgical group had much better with 92% good results as compared with 60% in the non-surgical group. [20] Although there is no such comparative study in our country, it can be safely assumed that with the improvement of imaging and surgical techniques, the diagnosis and treatment of lumbar disc prolapses around the world has become more uniform. The key to good results in disc surgery is appropriate patient selection. In 35% of cases there was narrow disc space at L4/5 level in X-ray but prolapse was found in only 14% of cases. Nabi et al (1982) observed narrow disc space 38.57% in their study. [21]

Various retrospective studies and some prospective studies showed good results range from 46% to 97%. Several points considered in the analysis of the results of lumbar disc surgery. [22] All the patients were examined for straight leg raising (SLR) on supine position. Preoperatively, the SLR was 42.6 ± 6.3 degree. However, following operation the SLR significantly improved from baseline 89.3 ± 2.6 at 3rd visit. Subjective assessment of patients indicated that majority (70%) had excellent function outcome followed by 14% had good functional outcome and (12%) had fair outcome. However, (4%) of patients had poor functional outcome.

Conclusion

From this study it revealed that management of prolapsed lumbar intervertebral disc by laminotomy and discectomy is an effective method of treatment and it reduces the complications and increases the chances of successful outcome. This study was done on 50 patients; follow up period was 6-12 months. So, further study with larger sample size, longer follow up period required to delineate the outcome.

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