

Management of Lumbar Spinal Stenosis by Laminectomy Experience with 80 Patients

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ABSTRACT:

Objectives: To study the clinical results and complications of patients with lumbar spinal stenosis managed surgically by single or two level laminectomy.

Study design: Retrospective study.

Materials and methods: This study was conducted in Neurosurgery Department of Lady Reading Hospital and Hayatabad Medical Complex Hospital, Peshawar from Jan, 2005 to December, 2007 with 06 months follow up. Total number of patients were 80. Data was collected with the help of performa containing name, age, sex of patients along-with signs symptoms, investigations, complications and follow up findings. Patients of both gender operated for the first time for lumbar spinal stenosis were included in the study Patients below 50 years, patients with spinal stenosis of more than 2 level, patients with spondylolisthesis and patients above 75 years were excluded from the study.

Results: Out of 80 patients 46 (57.5%) were male and 34 (42.5%) were female. 49 patients had single level laminectomy and 31 patients with two level laminectomies. 85% patients showed clinical improvement in pain and claudication, 6 patients had dural tear during surgery, one patient had CSF leak, 3 patients had superficial wound infection and 4 patients had urinary retention.

Conclusion: Laminectomy for lumbar spinal stenosis appears to be effective procedure in which better overall outcome and improvement in claudication, lower limbs pain and low backache can be achieved, improving health related quality of life.

Keywords: Lumber Spinal Stenosis, Decompression Laminectomy.

INTRODUCTION

Spinal stenosis was described as early as 1899 by Sachs and Frankel et al¹. Spinal stenosis is caused by narrowing of the spinal canal or the various tunnels through which nerves and other structures communicate with that canal². The chief complaint of patients with symptomatic spinal stenosis is claudication, an intense pain brought on by walking and usually felt in one or both lower extremities. The pain is often sufficiently intense to force patients to stop walking and to sit in order to seek relief. Claudication may be either vascular or neurogenic. Vascular claudication is brought on by ischemia. Neurogenic claudication is the pain associated with impingement of neural structures caused by lumbar spinal stenosis.

Spinal stenosis is classified as either primary or secondary. In primary stenosis, the spinal canal is constricted due to a congenital abnormality or a disorder in postnatal development³. In secondary stenosis, there is compression of neural elements due to one or more acquired conditions such as degenerative changes of the vertebral bodies, facet joints, and discs secondary stenosis may also occur in the late stages of an infection or following a fracture. Iatrogenic stenosis may occur post-surgically.

Initially patients are treated conservatively. However, low back pain and leg pain in patients with lumbar spinal stenosis sometimes show only temporary relief with conservative treatment⁴.

MATERIAL AND METHODS

This study was conducted in Neurosurgery Department of Lady Reading Hospital and Hayatabad Medical Complex, Peshawar from Jan, 2005 to Dec, 2008 with 06 months follow up. 80 patients of lumbar spinal stenosis including 46 (57.5%) male and 34 (42.5%) female with male to female ratio 1.35:1 were included in the study. These patients did not responded to conservative measures. Age ranged from 50 to 75 years with average age 62.5 years. Symptoms ranged from 6 months to 4 years. All patients had claudication distance ranging from 50 meters to 700 meters with mean claudication distance of 375 meters.

These patients were thoroughly examined with documentation of Neurologic status. MRI and CT scans were performed for confirmation for Lumbar Spinal Stenosis. Patients were admitted. Routine blood and urine tests were performed, X-ray chest, ECG, Blood Sugar, HBS, HCV, HIV and serum electrolytes were performed in all patients. After explanation of prognosis and consent, laminectomies were performed in all patients under General Anesthesia by performing single level laminectomy in 49 (61.25%) patients and two level laminectomy in 31 (38.75%) patients. All patients made uncomplicated recovery from General Anesthesia. They remain admitted for 4 - 5 days post operatively. After discharge they were followed at 1, 3 and 6 months. After 6 months comparison to initial assessment before surgery was made.

Operative procedure

Patients were put in prone position after General Anesthesia with chest and pelvis supported with pillows. After full preparation of skin and draping, mid-line skin incision were given over the selected level after muscle dissection single or double level laminectomies were performed according to investigations. Exit canal were decompressed after removing yellow ligament. Haemostasis was secured and wound was irrigated with normal saline after which it was closed in 4 layers and Antiseptic Dressing applied.

RESULTS

The outcome of surgery could not be predicted reliably from psychological, functional or pain measures⁵ but patients with more severe pre-operative symptoms and more physical function restrictions had better success results then those patients with more mild symptoms and less restrictive physical functions⁶.

Gender Distribution

In our study 46 (57.5%) patients were male and 34 (42.5%) female with male to female ratio 1.35:1 (Table 1).

Table 1: *Gender Distribution.*

Gender	Number of Patients	% age
Male	46	57.5
Female	34	42.5

Age range

The ages ranged from 50 to 75 years with mean age 62.5 years.

Symptoms

All cases had low Backache with radicular pain to the legs and numbness of feet upon walking

Level of Stenosis

49 patients had single level stenosis and 31 had two level stenosis with L₄₋₅ in 68 patients and L_{5-S1} in 12 patients (Table 2).

Table 2: *Level of Stenosis.*

Level of Stenosis	Number of Patients	% age
L ₄₋₅ Stenosis	68	85
L ₅ S ₁ Stenosis	12	15

Table 3: *Number of Levels.*

Level	Number of Patients	% age
Single Level	49	61.25
Two Level	31	38.75

Claudication Distance

Claudication distance ranged from 50 to 700 meters with mean claudication distance 375 meters.

Investigation

MRI and CT scans were performed for confirmation for Lumbar Spinal Stenosis. Patients were admitted. Routine blood and urine tests were performed, X-ray chest, ECG, Blood Sugar, HBS, HCV, HIV and serum electrolytes were performed in all patients.

Outcome

In 85% patients claudication and pain in lower limb improved in first follow up after 01 month. 4 patients deteriorated after 3 months follow up and 2 more deteriorated after 6 months of follow up inspite of initial improvement.

Complications

Overall complication rate was 28.75%. During surgery we had dural tear in 06 (7.5%) patients which were repaired during surgery. One had post-operative CSF leak that was re-explored after 10 days and the dura was repaired. Superficial wound infection was observed in 03 (3.75) patients who were treated by debridement, regular dressings and antibiotics. 06 (7.5%) patients had urinary retention which were relieved by catheterization. Catheters were removed after 48 to 72 hours. 02 patients remain catheterized for 03 weeks whose retention were not relived after giving them trial after 72 hours by removing catheter.

Two (2.5%) patients were reoperated after 04 months for second level laminectomy as their symptoms partially improved with initial single level laminectomy (Table 4).

Table 4: *Complications.*

Complication	Number of Patients	% age
Dural Tear	6	7.5
Wound infection	3	3.75
Retention	6	7.5
Revision	2	2.5
Deterioration	6	7.5

DISCUSSION

Lumbar Spinal Stenosis is common problem faced by neurosurgeons. Surgery is offered to the patients not responding to conservative medical therapy for more then 2 - 3 months. Different decompressive procedures have been adopted to relive the symptoms of patients.

In our study decompressive laminectomies were performed in 80 patients with single level laminectomy in 49 (61.25%) patients and two level in 31 (38.75%) patients. In our study 46 (57.5%) patients were male and 34 (42.5%) were female with male to female ratio 1.35:1 while in study conducted by M. Emran et al out of 61 patients 17 were male and 44

were female⁷ and in study by N. Natsuyama et al out of 40 patients male were 25 and female were 14⁸. Ages ranged from 50 to 75 years with mean age 62.5, while in study conducted by A. Karageorgos et al the mean age was 65.7 years (49 - 77 years)⁹ and in study by M. Emran et al the mean age was 72.8 years (54 – 85 years)⁷.

In our study single level stenosis was observed in 49 (61.25%) patients and two level stenosis in 31 (38.75) patients while in study conducted by M. Natsuyama et al 52.5% of patients had L₄₋₅ stenosis and 40% had stenosis at L₅S₁ level⁸. In study conducted by Efsthioiu P et al 39.28% had at L₄₋₅ stenosis while only 14.28% had stenosis at L₅S₁ level¹¹.

In our study L₄₋₅ level was the common site of stenosis which was observed in 68 patients while 12 patients had L₅-S₁ level stenosis. The same observations were made by the study of M. Natsuyama et al⁸.

Claudication distance ranged from 50 to 700 meters with mean claudication distance 375 meters. In study conducted by L. Lutchman et al the mean claudication distance was 762 meters.¹²

The clinical improvement was observed in 85% of patients with improvement of claudication distance, pain in lower limb and low backache. In study conducted by Efsthioiu P et al the clinical improvement and pain relief was achieved in 91% patients¹¹. In study by M.A El Masry et al 85% reported relief of leg pain and 96% reported increase in their walking distance and in 79% reported improvement in their back pain¹³. In study by S.A Mehdi et al 65% of patients experienced satisfactory improvement in symptoms¹⁴. In study by Fokter S.K et al 63.8% of patients had significant clinically improvement in symptoms severity⁶. Patient choice is an important factor in decision making regarding severity of signs and symptoms.

The overall complication rate was 28.75% while in study conducted by P. Guigui et al the complication rate was 26.5%¹⁵ and in study by L. Lutchman et al the complication rate was 10.20%¹². In our study dural tear was observed in 6 (7.5%) patients with one patient post-op CSF leak in which dura was repaired after re-exploration while in study by L. Lutchman et al 4 (8%) patients had dural tear¹². Superficial wound infection was observed in 3(3.75%) patients while in study conducted by A. Karageorgos et al 7.69% had superficial wound infection⁹ and in study by P. Guigui et al the infection rate was 13%¹⁵.

Two (2.5%) patients were re-explored for another level laminectomy as the symptoms partially improved

with single level laminectomy. The revision rate in study conducted by T. Sato et al is 2.7 percent¹⁶.

Six (7.5%) patients deteriorated in 06 months follow up inspite of initial improvement in pain and claudication. All these patients had symptoms for more then 03 years and they all of them were above 70 years of age which are poor prognostic factor of laminectomy for Lumbar Spinal Stenosis. In study conducted by A. Karageorgos et al 17% of patients deteriorated in 06 month follow up⁹.

In our study 06 (7.5%) patients had urinary retention, who were catheterized. Catheters were removed after 3 - 4 days while in 02 patient remain catheterized for 03 weeks. In study by C. J. M Getty et al 19.35% of patients had urinary retention after surgery¹⁷.

Two (2.5%) patients were operated for second level after 05 months of follow-up who did not showed satisfactory improvement after single level decompression. The revision rate mentioned by P. Guigui et al is 12%¹⁵.

CONCLUSION

Spinal decompression for lumbar spinal stenosis has been found to be effective, safe and providing good long term results regarding reduction in pain and claudication. Appropriate patient selection and attention to operative technique are of paramount importance.

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