

## Outcome of Back Pain in Patients with Lumbar Canal Stenosis, after Decompression without Fusion or Instrumentation

Ahmed M Koheil, Wael M Nazim

Department of Neurosurgery, Faculty of Medicine, Beni Suf University, EGYPT

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**BACKGROUND:** Surgical treatment for lower limb manifestations of lumbar disc prolapse and lumbar canal stenosis is a standard procedure. However, there is considerable debate about the proper management of associated low back pain.

**OBJECT:** We aimed to assess the outcome of back pain in patients with lumbar canal stenosis after decompression without fusion or instrumentation.

**METHODS:** Fifty patients were included in the current retrospective study. Intraoperative formal laminectomy or minimally invasive unilateral or bilateral laminotomy was done. The back pain and leg pain were evaluated preoperatively and at 6 months postoperatively using the visual analogue scale (VAS).

**RESULTS:** The baseline of low back pain was 6 or more according to the VAS. The mean age of the patients was 50.2 years, 60% of them were males. The mean body mass index (BMI) was 33.36. Single level decompression was done in 44% of the patients, while 56% had 2 or more levels of decompression. The mean preoperative and postoperative back pain according to VAS, were 6.46 and 4.74, respectively, while the mean preoperative and postoperative leg pain according to VAS was 7.48 and 3.5, respectively.

**CONCLUSION:** After a postoperative period of 6 months, low back pain improved significantly after decompression only surgery in patients with lumbar canal stenosis in the absence of spondylolisthesis, sagittal mal-alignment or scoliosis.

**KEYWORDS:** Low back pain, lumbar canal stenosis, lumbar decompression, lumbar spinal stenosis.

### INTRODUCTION

Back pain is a common health problem, affecting around 80% of population at least once a lifetime. The management of axial low back pain may be difficult, because of poor understanding of its exact pathophysiology.<sup>1,2</sup>

While surgical treatment for lower limb manifestations of lumbar disc prolapse and lumbar canal stenosis is established after failure of conservative measures, there is considerable debate for the proper management of associated low back pain.<sup>1,3,4</sup> In the presence of considerable back pain, surgical decompression alone without fusion is not supported by some surgeons. Other studies that do not favor fusion, point to the importance of excluding causes of instability and malalignment.<sup>5,6</sup>

This study was carried out to assess the outcome of back pain after decompression only surgery in cases of lumbar canal stenosis without evident instability or scoliosis.

### METHODS

Fifty patients with significant preoperative low back pain,

6 or more, according to the visual analogue scale (VAS), were included in this retrospective study. All patients were candidates for surgery after failure of improvement with conservative treatment. Conservative measures include medications, physiotherapy, activity modification and weight reduction when required. A course of 3 months without significant clinical improvement is considered indication of failure.

All patients were evaluated carefully clinically before surgery. Radiological investigations including magnetic resonance imaging (MRI), dynamic X-Ray in the standing position were obtained also for all patients. Computerized tomography (CT) of the lumbosacral spine was done when required. Presence of malalignment, scoliosis or spondylolisthesis were exclusion criteria. Recurrent cases were also excluded. The back and leg pain were evaluated preoperatively and at 6 months postoperatively in all patients using the visual analogue scale (VAS).

Intraoperative formal laminectomy or minimally invasive unilateral or bilateral laminotomy was done as judged by the surgeon. Mesial facetectomy of no more than 1/3 of each facet to avoid postoperative instability was assured. Patients who required extensive facetectomy were excluded from the study as this will cause iatrogenic instability. Patient who required additional fixation were excluded also. Discectomy was done in cases of discogenic canal

#### Correspondence:

Ahmed M Koheil  
Department of Neurosurgery, Faculty of Medicine, Beni Suf University, EGYPT  
Email: akoheil@med.bsu.edu.eg

stenosis. Foraminal decompression was also done to free the affected roots as indicated.

**RESULTS**

The age of the patients ranged from 28 to 71 years with a mean age of 50.2. Males were more common (60%), compared to females (40%). The body mass index (BMI), ranged from 23 to 48 with a mean of 33.36. Multilevel decompression (2 or more), was done more than single level (56% and 44% respectively).

Regarding back pain, all patients had significant pain before

surgery ranging from 6 to 8 according to VAS with a mean of 6.46. At six months after surgery, the mean postoperative back pain was 4.74, ranging from 2 to 8. Thirty-seven patients improved (74%), while 6 were stationery (12%), and 7 had worse back pain (14%) according to the VAS, p value <0.005. (Table 1).

The mean VAS of preoperative and postoperative leg pain was 7.48 (ranging from 6 to 9), and 3.5 (ranging from 2 to 7) respectively. Forty-nine patients (98%) improved, while only 1 (2%) had the same level of pain, p value < 0.005. (Table 2).

**Table 1: Shows range, mean and standard deviation of age, BMI, back and leg pain**

	Number	Minimum	Maximum	Mean	Std. Deviation
Age	50	28	71	50.20	11.966
BMI	50	23.0	48.0	33.360	5.0292
Back pain (pre)	50	6	8	6.46	0.579
Back pain (post)	50	2	8	4.74	1.468
Leg pain (pre)	50	5	9	7.48	0.762
Leg pain (post)	50	2	7	3.50	1.074

**Table 2: Statistical analysis of pre and postoperative back and leg pain**

Mean		Paired Differences				p value
		SD	Std. Error Mean	95% Confidence Interval of the Difference		
				Upper	Lower	
Pair 1	Back pain pre – post	1.720	1.762	1.219	2.221	0.000
Pair 2	Leg pain pre – post	3.980	1.363	3.593	4.367	0.000

**DISCUSSION**

Surgical treatment of lumbar canal stenosis is established after failure of conservation measures, but the decision of best surgical option is controversial.<sup>1,4,5,7,8</sup> The existing controversy in the management regarding patients who have considerable back pain whether to be fused or not, as it has been taught that those patients would not improve.<sup>3,5,8,9</sup>

This study aimed at evaluation of surgical decompression only without fusion or fixation in cases of lumbar canal stenosis (discogenic or degenerative) with significant back pain in the absence of instability and malalignment.

This is a good point in this study, as not all studies that favor fusion or stabilization in lumbar canal stenosis exclude instability. Studies on the surgical outcome are comparing non-operative versus operative treatment, or comparing fusion versus non fusion but do not clearly exclude patients with instability thus favoring fusion over surgical decompression only.<sup>4,5,8</sup> Crawford et al., stressed on the lack of excluding patients with such causes in several studies.<sup>5,6</sup> Also in the guideline update by Resnick et al, they did not support the addition of fusion in the absence of

malalignment or instability.<sup>10</sup>

In our study, all patients had significant preoperative back pain, 6 or more according to VAS. The improvement of pain was from 6.46 to 4.74 at 6 months after surgery, (p-value <0.005). This agrees with Crawford et al; who reported improvement of back pain from 7.62 to 3.66 after 1 year in their study.<sup>5</sup>

Although significant in all of our patients, none had dominant back pain in comparison to leg pain. Some authors favor fusion over decompression alone in those patients, i.e. with dominant back pain,<sup>1,7</sup> although we found in other studies that even those patients improved with decompression alone.<sup>5,11,12</sup>

Intraoperative indications for fusion should not be ignored, such as when extensive decompression is required in cases associated with significant stenosis due to facet hypertrophy, because this will result in instability.<sup>6,13</sup> In our study, patients who required more than 1/3 mesial facetectomy on each side or showed instability were excluded. The limitation of the difference in surgical technique is eliminated in our study by the limited number of operators.

Recurrent cases were excluded also from this study. Although these cases might not require fusion, but Geiger et. al, pointed that fusion or even instrumentation should always be considered in selected cases even if not planned before surgery.<sup>6,13</sup>

An important issue also that back pain has different sources, and sometimes it can not be specified. For example, some patients with radicular pain that starts from the buttocks interpret it as back pain. Also, sacroiliac joint dysfunction is a commonly associated source of back pain that can be managed conservatively with analgesics and later with injection. Exclusion of associated instability or malalignment is important as it accounts for failure of back pain improvements after decompression only.<sup>5,11,13,14</sup>

There are some weak points in this study. The retrospective nature prevented us from discussing several points that could fortify it, like the pattern of decompression and whether less invasive techniques could make difference in the outcome.<sup>3</sup> The lack of longer time of follow up and control group comparing with fusion, are other defects. In Crawford et. al; study, even patients with significant back pain who improved with decompression only, showed worse back pain later.<sup>5</sup>

The determination of patients that might require further fusion needs long period of follow up. Longer follow up requires meticulous assessment of changes in physical activity and psychological factors, as even patients with fusion showed later worse back pain in some studies.<sup>5,12-15</sup>

Also some positive advantages of decompression only surgery over fusion were not evaluated in this study like the operative time, blood loss, and hospital stay.<sup>11,13</sup>

## CONCLUSION

The current work shows that not all patients suffering from lumbar canal stenosis with significant back pain require fusion. Proper selection of patients is a must. Further comparative studies with longer follow up are essential to verify this fact.

## List of Abbreviations

BMI: Body Mass Index.

CT: Computerized Tomography.

MRI: Magnetic Resonance Imaging.

SD: Standard Deviation.

Std: Standard.

SPSS: Statistical Package for the Social Science.

VAS: Visual Analogue Scale.

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