MANAGEMENT OF LUMBAR SPINAL CANAL STENOSIS

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ABSTRACT

BACKGROUND

Spinal stenosis is one of the most common conditions in the elderly. It is defined as a narrowing of the spinal canal. The term stenosis is derived from the Greek word for narrow, which is "Stenos". The first description of this condition is attributed to Antoine portal in 1803. Verbiest is credited with coining the term spinal stenosis and the associated narrowing of the spinal canal as its potential cause.[1-10] Kirkaldy–Willis subsequently described the degenerative cascade in the lumbar spine as the cause for the altered anatomy and pathophysiology in spinal stenosis.[11-15] If compression does not occur, the canal should be described as narrow but not stenotic. Some studies defined lumbar spinal stenosis as a "narrowing of the osteoligamentous vertebral canal and/or the intervertebral foramina causing compression of the thecal sac and/or the caudal nerve roots; at a single vertebral level, narrowing may affect the whole canal or part of it" (Postacchini 1983). This definition distinguished between disc herniation and stenosis.[16]. The most common type of spinal stenosis is caused by degenerative arthritis of the spine. Hypertrophy and ossification of the posterior longitudinal ligament which usually are confined to the cervical spine, and diffuse idiopathic skeletal hyperostosis (DISH) syndrome also may result in an acquired form of spinal stenosis. Congenital forms caused by disorders such as achondroplasia and dysplastic spondylolisthesis are much less common. Congenital spinal stenosis usually is central and is evident or imaging studies. Idiopathic congenital narrowing usually involves the anteroposterior dimension of the canal secondary to short pedicles; the patient otherwise is normal. In contrast, in achondroplasia, the canal is narrowed in the anteroposterior plane owing to shortened pedicles and in lateral dimension because of diminished interpedicular distance. Acquired forms of spinal stenosis usually are degenerative. This process is most commonly localised to the facet joints and ligamentum flavum, with the resultant arthritic changes in the joints visible on radiographic studies. Frequently, these abnormalities are symmetrical and bilateral. The L4-L5 level is the most commonly involved, followed by L5-S1 and L3-L4 disc herniation and spondylolisthesis may exacerbate the narrowing further.

METHODS

This study was taken up to evaluate the management of lumbar spinal canal stenosis cases. The study was conducted from May 2012 to October 2014: A total of 86 patients of 55-70 age groups with degenerative LCS were followed prospectively from May 2012 to October 2014. All the treatment methods were explained to patients and treatment method was determined by patient's choice. The sample is divided into two groups 42 surgical and 44 conservative based on patient's preference.

MEASUREMENT OF OUTCOME

Outcomes were measures of bodily pain and physical function on the medical outcomes study 36-item short-Form General Health Study (SF-36) 22-25 and on the modified Oswestry Disability Index 26 measured at 6 weeks, 3 months, 6 months, and 1 year and 18 months. SF-36 scores range from 0 to 100 with higher scores indicating less severe symptoms. The Oswestry Disability Index ranges from 0 to 100, with lower scores indicating less severe symptoms.

STUDY INTERVENTION

The protocol surgery was standard posterior decompressive laminectomy operated by three surgeons. The type of nonsurgical care included physical therapy (68% of patients), epidural injections (56%), the use of anti-inflammatory drugs (55%) and use of opioid analgesics (27%). Informed consent was taken from every patient after explaining the particulars of study interventions.

In this study, 82% patients (n=70) were in age group 50-59 years with an average age of 50.2 years with a total sample size of 86 patients followed by 60-69 years age group. Both the surgical and conservative groups had similar sex distribution. Initially, the selection criteria for the study was formulated based on predetermined inclusion and exclusion criteria. All the patients are suffering from symptoms form a duration ranging from 6 months to 2 years with an average duration of 15 months. All the patients are having intermittent neurologic claudication or radiculopathy and sensory symptoms correlating with MRI study. The process of evaluation was explained to patients and informed consent was taken. For evaluating outcomes of treatment ODI, SF 36 BP, SF36 PF was used.[17,18,19] The baseline values are similar in both surgical and conservative groups for above mentioned 3 clinical assessment parameters. Treatment outcome was measured by "Change in Mean" of these parameters after periodic evaluation and statistical significance was also calculated. While evaluating outcomes the predominant difficulty faced is loss to follow-up due to non-adherence and cross over between group and these patients were excluded from study which resulted in a sample size of 86 (Surgical – 42, Conservative – 44). This study showed significantly more improvement in all outcomes such as pain and function in patients treated operatively compared with those treated non-operatively.

For assessment of disability in this study with regard to the choice of the measure of disability, the ODI (Oswestry Disability Index) was opted as it is a simple, condition specific, preferred multidimensional tool with the advantage of easy patient comprehension and compliance. This self–assessment test takes less than 5 min. to complete and 1 min. to score with no training, equipment or cost requirements; and it covers a wide range of function, pain. The national translated version of the ODI questionnaire used in this study was easily comprehended. Studies have reported that this short, self-administered questionnaire is reproducible, reliable, internally consistent, and valid and is an adequately useful instrument for the assessment of disability in patients with lower back pain.

The other parameters i.e. SF 36 BP, SF 36 PF (Used in this study) have also been used in SPORT study, main stenosis study.[17,18]

RESULTS

This study was taken up to evaluate the management of lumbar spinal canal stenosis cases. The study was conducted from May 2012 to October 2014: A total of 86 patients of 55-70 age groups with degenerative LCS were followed prospectively from May 2012 to October 2014. All the treatment methods were explained to patients and treatment method was determined by patient's choice. The sample is divided into two groups; 42 surgical and 44 conservative based on patient's preference. Gender distribution in sample population was 75% male, 25% females. Most of the patients have more than one component. 47% patients had central canal stenosis and 48% had lateral, 32% far lateral stenosis. The mean operative time was 128 minutes. The mean operative blood loss was 293 mL. Average hospital stay was 15 days. 2% patients had dural tear, 11% patients had superficial surgical wound infection, which was treated by topical antiseptics. No complications were observed in conservative treatment. 34% patients received NSAID, 18% received ESI, 27% received PT, 15% received combined treatment. Assessment of ODI, SF 36 BP, SF 36 PF in study population and values are expressed in terms of mean and treatment effect/outcome was measured in terms of change in mean. Baseline mean values of surgical and conservative groups are similar. At periodic follow-ups, mean change is more in surgical group than conservative group. Hence, it is concluded that mean is effectively changed in surgical group than conservative groups.

CONCLUSIONS

Radiologic stenosis correlates poorly with clinical disability. As such, a thorough clinical examination of patients with lumbar spinal stenosis, including assessment of psychosocial factors, is crucial in determining the treatment outcome. The treatment effect for surgery was seen as early as 6 weeks. Appeared to reach a maximum at 6 months, and persisted for 18 months. The condition of patients in the non-surgical group improved only moderately during the 18-month period. Results in both groups were stable during every follow-up throughout the period of study i.e. from 6 weeks to 18 months. No catastrophic events arose among the patients receiving conservative treatment. De compressive surgery (Laminectomy) is more effective than conservative treatment for radicular pain due to lumbar spinal canal stenosis. The functional effectiveness of surgery for pain and disability was sustained and more on comparison with conservative treatment. Those treated surgically showed significantly greater improvement in terms of function and self-rated progress over 18 months compared to patients treated nonoperatively in terms of ODI index, SF 36 BP, SF 36 PF scores.

KEYWORDS

Spinal Stenosis C05.116.900.825, Foraminotomy E04.525.305, Spinal Fusion E04.555.100.700.

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INTRODUCTION: Lumbar Spinal stenosis due to degenerative changes is a common cause of low back ache and leg pain in individuals starting in the 5th and 6th decades of life. Rates of surgery for spinal stenosis have been increasing dramatically. A lack of clinical consensus about indications for choice of treatment options is thought to explain the variation in the management of patients with lumbar spinal stenosis.

For individuals treated in contemporary clinical practice, the only prospective outcomes comparing surgical and nonsurgical treatment are from an observational study.

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Although, surgery is an accepted and commonly performed treatment for lumbar spinal stenosis, there is little evidence to support the relative benefits of surgery compared with nonsurgical treatments. In respect to data published, it was found that the paucity and heterogeneity of evidence limited conclusion regarding surgical efficacy for spinal stenosis. The trials comparing surgical with non-surgical treatment were generally small and involved patients both with and without degenerative spondylolisthesis lacked nonoperative controls and validated outcome measures.

AIMS AND OBJECTIVES:

- The primary aim of the study is to evaluate the treatment outcome in both surgical and conservative management in patients of lumbar canal stenosis.
- To compare the effectiveness of surgical and conservative treatment in lumbar canal stenosis.

MATERIALS AND METHODS: This study was taken up to evaluate the management of lumbar spinal canal stenosis cases. The study was conducted from May 2012 to October 2014: A total of 86 patients of 55-70 age group with degenerative LCS were followed prospectively from May 2012 to October 2014. All the treatment methods were explained to patients and treatment method was determined by patient's choice. The sample is divided into two groups 42 surgical and 44 conservative based on patient's preference.

Measurement of Outcome: Outcomes were measures of bodily pain and physical function on the medical outcomes study 36-item short-Form General Health Study (SF-36) 22-25 and on the modified Oswestry Disability Index 26 measured at 6 weeks, 3 months, 6 months, and 1 year and 18 months. SF-36 scores range from 0 to 100 with higher scores indicating less severe symptoms. The Oswestry Disability Index ranges from 0 to 100, with lower scores indicating less severe symptoms.

Inclusion Criteria:

A) History of neurologic claudication or radicular leg symptoms for at least 12 weeks.
B) Confirmatory imaging showing lumbar spinal stenosis.

Exclusion Criteria:

1. Other comorbidities i.e. uncontrolled diabetes, hypertension, allergy to steroids.
2. Those with structural deformities like scoliosis, kyphosis.
3. Patients with primary bony canal stenosis, traumatic lumbar canal stenosis, stenosis due to tumours and infection.
4. Patients with degenerative spondylolisthesis.
5. Patients with lumbar instability (Which was defined as translation of more than 4 mm or 10 degrees of angular motion between flexion and extension on upright lateral radiographs).
6. Previous surgeries at the same motion segment.

RESULTS: This study was taken up to evaluate the management of lumbar spinal canal stenosis cases. The study was conducted from May 2012 to October 2014: A total of 86 patients of 55-70 age groups with degenerative LCS were followed prospectively from May 2012 to October 2014. All the treatment methods were explained to patients and treatment method was determined by patient's choice. The sample is divided into two groups; 42 surgical and 44 conservative based on patient's preference. Gender distribution in sample population was 75% male, 25% females. Most of the patients have more than one component. 47% patients had central canal stenosis and 48% had lateral, 32% far lateral stenosis (Fig. 7). The mean operative time was 128 minutes. The mean operative blood loss was 293 mL. Average hospital stay was 15 days. 2% patients had dural tear, 11% patients had superficial surgical wound infection, which was treated by topical antiseptics. No complications were observed in conservative treatment. 34% patients received NSAID, 18% received ESI, 27% received PT, and 15% received combined treatment. Assessment was done by ODI, SF 36 BP (Fig. 1&2), and SF 36 PF (Fig. 3&4) in study population. Values are expressed in terms of mean and treatment effect/outcome was measured in terms of change in mean. Baseline mean values of surgical and conservative groups are similar. At periodic follow-ups, mean change is more in surgical group than conservative group. Hence, it is concluded that mean is effectively changed in surgical group than conservative groups.

DISCUSSION: Weinstein et al (2010) showed that patients with spinal stenosis treated surgically showed substantially greater improvement in pain and function during a period of 2 years than those treated nonsurgically.[19] All patients in their study were surgical candidates with a history of at least 12 weeks of neurogenic claudication or radicular leg symptoms and spinal stenosis without spondylolisthesis (as confirmed on imaging). They were enrolled in either a randomised cohort (269 patients) or an observational cohort (365 patients) at 13 U.S. Spine clinics and were treated by either standard decompressive laminectomy (414 patients) or usual nonsurgical care (240 patients).

The result of this study were similar to Weinstein et al. Mean change (decrease) in ODI in surgical group was –17.8 at 6 weeks, 22.3 at 3 months, 22.5 at 6 months, 22.7 at 18 months whereas Sport Study showed -17±0.9 at 6 weeks -21.4±0.9 at 3 months -22.9±1.0 at 6 months -21.4±1.0 at 1 year, -20.5±1.0 at 18 months.

In our study in the conservative group, the mean changes in ODI mean were 7.5 at 6 weeks, 6.4 at 3 months, 8.9 at 6 months, 8.4 at 1 year, and 8.8 at 18 months. Whereas Sport Study showed -6.8 at 6 weeks, -7.6 at 3 months, -8.8 at 6 months, -8.9 at 1 year, 9.3 at 2 years.

The mean change (increase) of surgical group in terms of SF 36 BP are 19.8 at 6 weeks, 27.9 at 3 months, 29.5 at 6 months, 28 at 1 year, 26.9 at 18 months which were similar to Sport Study which showed 19.8±1.1 at 6 weeks 27.9±1.1 at 3 months 29.5±1.3 at 6 months 28.0±1.2 at 1 year, -26.9±1.2 at 2 years. In conservative group, SF 36 BP data showed mean changes of 11.7 at 6 weeks, 12.4 at 3 months, 13.5 at 6 months, 13.8 at 1 year, 13.3 at 18 months, resembling 8.7 at 6 weeks, 11.8 at 3 months, 18.1 at 6 months, 17.5 at 1 year, 15.6 at 2 years with SPORT STUDY.

SF 36 PF in surgical groups 17.3 at 6 weeks, 24.3 at 3 months, 26.4 at 6 months, 26.7 at 1 year, 27.2 at 18 months and conservative showed 9.06 at 6 weeks, 9.7 at 3 months, 10.9 at 6 months, 11.3 at 18 months SPORT STUDY showed surgical 17.8±1.1 conservatively 8.7±1.1 at 6 weeks. Surgically 24.8±1.2, conservatively 10.0±1.2 at 3 months; at 6 months surgically 26.9±1.3, conservatively 10.6±1.3; at 1 year surgically 26.5±1.2, conservatively

10.5±1.4; at 2 years surgically showed 23.0±1.3 conservatively 11.8±1.4.

The treatment effect for surgery was seen as early as 6 weeks, appeared to reach a maximum at 6 months, and persisted for 18 months; it is notable that the condition of patients in the nonsurgical group improved only moderately during the 18 months period. The characteristics of the patients were similar to those in previous studies. In this study, the functional status of the patients of baseline was similar to that of patients in the Maine Lumbar Spine Study(SF -36 score, 34.8 and 35.0, respectively) but worse than that in the study by Malmivaara et al (Oswestry Disability Index, 42.4 and 35.0, respectively).[17,20,21] Functional improvement in the nonsurgical group was greater in our study than in the previous studies, with a change of 10.5 in the SF – 36 physical function score at 1 year, as compared with 1.0 in Maine Lumbar Spine Study, and a change of 9.3 in the Oswestry Disability Index at 2 years, as compared with 4.5 in the study by Malmivaara et al. The greater improvements in our study, compared with those in the study by Malmivaara et al may be related to differences in the selection of patients.[21] The estimated 1-year treatment effects for surgery were smaller in our study in the Maine Lumbar Spine Study (changes in bodily pain of 14.6 and 30.4 respectively and in physical function of 15.9 and 25.5 respectively). However, in the Maine Lumbar spine study, treatment effects for baseline differences between the study groups were not adjusted, which probably explains these discrepancies. At 1 year, the estimated treatment effects were similar in our study and the study by Malmivaara et al; Oswestry Disability Index, -12.6 and -11.3 respectively. According to JBJS 2007, ODI scores improved more in patients who received surgery than in patients who received nonoperative treatment.[22] The effect was seen as early as 6 weeks, appeared maximal by 3 to 12 months and has persisted over 18 months. The nonoperative treatment group demonstrated only modest improvement over time.(Fig. 5)

The Spine Journal (2008) 336-340 summarises that after decompression, mental aspects improve earlier than physical aspects of HRQOL, and higher mental scores in LCS patients, when compared with the Italian and Japanese general populations, probably are due to the improvement of pain relief after surgery.[23]

Randomisation was done by Amundsen 2005, Malmivaara et al, Weinstein et al, Zucherman et al and treatment allocation was not concealed in Amundsen study.[19,21,24,25,26]Zucherman et al and Malmivaara et al used central randomisation. Weinstein followed automated randomisation in both studies. Individual groups of all the studies are with similar baseline characters. Current study is a prospective study, similar baseline value (Mean) of ODI, SF 36 BP, SF 36 PF in individual groups.

In Amundsen study and our study, the evaluation protocol "after discharge from the hospital after 1 month, and further treatment in both groups were identical.[24] Weinstein et al study was a pragmatic trial. The control group consisted of a variety of interventions at the physician's discretion or patient's preference. Moreover, patients in the surgery group could also receive conservative treatments.[25] In Zucherman et al, details on the co-interventions in the surgery group are not provided. In this study, conservative group received the same treatment throughout the study period. Where as in surgical group, some patients (n=22) received trial of conservative treatment such as physiotherapy and epidural steroids. Rest of the patients (n=20) received only surgical treatment.[26] These patients had severe clinical presentations and symptom duration is relatively shorter on comparing with patients who received preoperative conservative treatment. Postoperatively, patients were prescribed NSAID for a short duration of time (12 days) and lumbar corset was used for 4 weeks followed by back exercises and continued using the same occasionally. In our study, no postoperative conservative treatment was given in surgery group (except short duration of NSAID). Whether the patient received trial of conservative treatment before surgery or not it is unlikely that this will cause bias.[27]

Even though the compliance rate was acceptable in Malmivaara et al, Amundsen et al studies, compliance with assigned treatment was low with Weinstein et al and, Zucherman et al studies.[21,24,25,26] A significant proportion of patients in both groups crossed over to the treatment assigned for the other group in trail by Weinstein et al. However, results were analysed according to the "intention to treat" principle in order to avoid bias.[25] In Malmivaara et al study of the 50 patients who were randomised into the surgical group, 4 patients were not subjected to surgery while 4 of the 44 patients randomised into the no-surgery group were operated upon during the 2-yr. follow-up.[21] In Amundsen study of the 18 patients who were randomised into the control group, 10 patients crossed over to the surgery group.[24] In our study, initially a total of 114 patients were enrolled in study and treatment method was determined by patient preference. 14 patients had cross over from conservative to surgery, 9 patients received physiotherapy postoperatively. 5 patients skipped the follow-up. So as to avoid interference of these factors in assessment of treatment outcome, 28 patients were excluded from study which finally formed a total sample size of 86 patients. These patients' compliance was adequate and on par with above-mentioned studies.

Care providers and patients were not blinded in Amundsen 2005, Malmivaara et al, Weinstein et al, Zucherman et al.[24,21,25,19,26] Blinding of outcome assessor was not known in Amundsen 2005, and Malmivaara et al studies.[24,21] All patients were seen by the same physician (not a surgeon) in Amundsen 2005.[24] Most outcomes consisted of patients reported outcomes in other randomised controlled studies. In this study, care provider and outcome assessor were same and were not blinded; even patients were also not blinded and outcome reports consists of patients' reported outcome.

In Amundsen 2005, cases of one patient assigned to surgery and one patient assigned to the control group were lost to follow-up at 4 yrs. because of death.[24] At 10 yrs., cases of 2 patients and one patient, from the respective groups, were lost to follow-up for the same reason. In Malmivaara et al, there were three patients in the surgery group and four in the no-surgery group, the cases of whom were lost to follow-up.[21] In Weinstein et al, in each group, 17% of the patients were not available at the last visit (2 yrs.) for similar reasons.[25] Moreover, the high rate of cross over (42% overall) might create a bias towards the null hypothesis. In the study of Zucherman et al, out of 100, 9 patients assigned to control group withdrew from the study before receiving their initial epidural injections, they entered the study hoping to be randomised to surgery. Moreover, at 2-yr. follow-up of the case, 7 patients in the surgery group and 10 additional patients in the control group were not available for analysis.[26] This could eventually bias the results against surgery. In this study, patients who had completed follow-up of 18 months were included in study, rest of patients were strategically excluded in order to avoid bias. Out of 114 patients, 5 patients lost to follow-up and these patients were not included in any group, as withdrawal/dropout rate unlikely to causes bias.

The timing of the outcome assessment in both groups was comparable in Amundsen 2005. Malmivaara et al, Weinstein et al, Zucherman et al i.e. 6 weeks, 3 months, 6 months, 1 yr., 2 yrs., 4 yrs. Whereas the timing of assessment in present study was 6 weeks, 3 months, 6 months, 1 yr., 18 months.[24,21,25,19,26]

Regarding surgical and postoperative care, the decision on the kind of surgery or conservative treatment applied to each patient was left up to the therapists and no explicit criteria was used in Amundsen study.[24] Decompression (Laminectomy, facetectomy, discectomy, removal of osteophytes, and hypertrophic ligamentum flavum, with or without fusion and stabilising orthosis for 3 months., "back school", rehabilitation for one month, and subsequent stabilising exercises all were used. In Malmivaara et al study, segmental decompression and undercutting facetectomy, with or without fusion (with or without transpedicular instrumentation) along with brochure on spinal stenosis and the principles of activation and physical training, education on pain relieving body postures, ergonomics, and individualised exercises were used.[21]Weinstein et al used posterior decompressive laminectomy with or without bilateral single level fusion (with or without posterior pedicle screw instrumentation).[19] In Zucherman et al study, interspinous process distraction system (X-STOP) was used.[26] In this study, the surgical and postoperative care is in identical lines with Amundsen et al, but posterior instrumentation was not done in this study.

In conservative treatment in Amundsen study, a stabilising orthosis was used (for all activities during the day) for three months, "back school", rehabilitation for one month and subsequent stabilising exercises were also employed, whereas Malmivaara et al used NSAIDs, physiotherapy (ultrasound and transcutaneous nerve stimulation and exercises) for 24% of the patients and brochure on spinal stenosis and the principles of activation and physical training, education on pain relieving body postures, ergonomics, and individualised exercises.[24,21] Conservative treatment by Weinstein et al consisted of active physical therapy, education, or counselling including instructions for exercising at home, and NSAID if tolerated.[25] In Zucherman et al study, patients randomised to the control group received at least one epidural steroid injection after enrolment were prescribed additional epidural steroid injections, along with non-steroidal anti-inflammatory medication, analgesics and physical therapy as necessary. Physical therapy consisted of back school and methods such as icepacks, heat packs, massage, stabilisation exercises, and pool therapy.[26] In this study, out of 86 patients 44 were included in conservative group. For which NSAID/opioids were given in 15 patients, epidural steroids in 8 patients, physiotherapy in 12 patients combined in 7 patients. In all the studies included above including current study, each care provider decided at the form of conservative or surgical treatment applied to a given patient without following any predefined indication criteria. This approach was probably the only feasible one, but it led to treatments within the conservative and surgical groups being as heterogeneous as they are in routine practice both across studies and across patients in the same study. This precludes any conclusion on the comparative effectiveness of any particular form of surgery or conservative treatment. However, surgery was more effective than conservative treatment across all the studies and results of surgery were roughly consisted among different trails.

The adverse events documented in various studies among patients treated conservatively included injection intolerance, symptom flare, leg paraesthesias, and increased back pain. Among patients who underwent decompressive surgery, between 5.4% and 14% suffered from peri operative complications (The most common being, in all studies, dural tears). Postoperative complications documented were pulmonary oedema, peridural haematoma, sepsis, and misjudgement of stenotic level. Reported reoperation rates were 1.3% to 2% at one year, 6% to 11% at 2 years, and 15% at 4 years.[21,19,25] The rate of recurrent stenosis at 4 years was 5%. In our study, no reoperation was performed.(Fig. 6)

Worsening of symptoms despite adequate conservative treatment is an indication for operative treatment. Weinstein et al. showed significantly more improvement in all primary outcomes in patients treated operatively compared with those treated nonoperatively. In patients with imaging confirmed spinal stenosis without spondylolisthesis and leg symptoms persisting for at least 12 weeks, surgery was superior to nonsurgical treatment in relieving symptoms and improving functions.

These analyses were based on treatment assignment in a prospective observational study, the results were strengthened by the use of specific inclusion and exclusion criteria, the sample size, and the adjustment for baseline values of ODI, SF 36 BP, SF 36 PF.

In all the studies including current study, surgery led to better results for pain, disability, and quality of life. Results of surgery were similar among patients with or without spondylolisthesis, and slightly better among those with neurogenic claudication than among those without it. The advantage of surgery was noticeable at 3 to 6 months and remained for up to 2 years, although at the end of that period difference tended to be smaller.

Main methodological concerns in current study is the heterogeneity of treatments within the conservative group, the fact that all patients included had unsuccessfully undergone conservative treatments, previously which may have led to differences in results and increased crossover, withdrawal and dropout rates, and the lack of blindness of care provider, patients, and outcome assessment.

For surgically treated patients, decompressive laminectomy varies in its location and extent, and there is increasing use of fusion, especially with instrumentation. For nonsurgically treated patients, a wide variety of measures are used, including invasive procedures such as epidural and facet blocks. Thus, despite evidence from this and other studies demonstrating at least short-term benefit of surgical treatment, larger randomised trials such as the spine patient outcomes research trails are clearly needed to better define the relative benefit of alternative treatments and which patients derive any benefit.

SF 36 BP	Surgical	Conservative
Before Treatment	31.4±0.6	31.8±0.6
6 weeks after treatment	51.2±1.1	43.5±1.1
3 months	59.3±1.1	44.2±1.2
6 months	60.9±2.2	45.3±2.1
1 year	59.4±2.3	45.6±2.2
18 months	58.3±2.3	45.1±2.2

Table 1: Showing SF 36 BP Mean Changes during Study Period

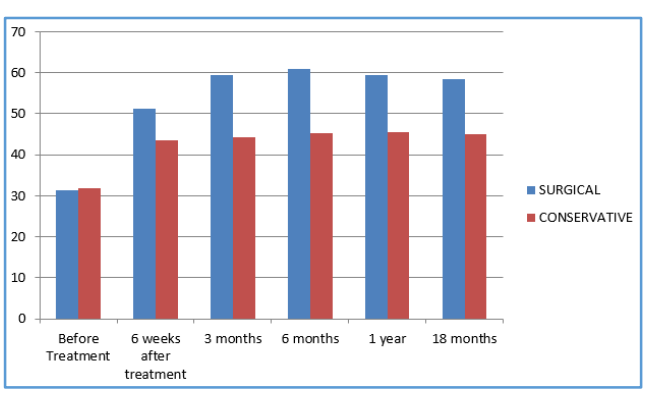

Fig. 1: Bar chart Showing SF 36 BP Mean Changes during Study Period

SF 36 PF	Surgical	Conservative
Before Treatment	35.3±0.8	35.2±0.8
6 weeks after treatment	52.7±1.1	44.3±1.1
3 months	59.7±1.2	45.0±1.2
6 months	61.8±2.3	46.1±2.2
1 year	62.1±2.4	46.2±2.3
18 months	62.4±2.4	46.6±2.3

Table 2: Showing Mean Changes in SF 36 PF during Study Period

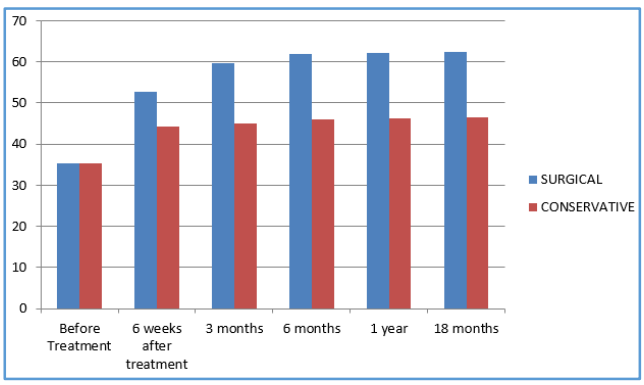

Fig. 2: Bar chart Showing Mean Changes in SF 36 PF During Study Period

Surgical	6 weeks	3 months	6 months	1 year	18 months
ODI	7.5	22.3	22.5	22.7	21.7
SF 36 BP	19.8	27.9	29.5	28	26.9
SF36PF	17.3	24.3	26.4	26.7	27.2
Conservative	**6 week**	**3 months**	**6 months**	**1 year**	**18 Months**
ODI	7.5	8.4	8.9	8.4	8.8
SF36BP	11.7	12.4	13.5	13.8	13.3
SF36PF	9.06	9.7	10.8	10.9	11.3

Table 3: Showing Mean Change in ODI, SF 36 BP, SF 36 PF in Surgical and Conservative Groups during Periodic Follow-up

COMPLICATIONS:

Intraoperative	No. of patients
Dural tear or spinal fluid leak	1
Iatrogenic nerve root injury	None
Iatrogenic facet joint excision	1
Post-operative	
Wound infection	5
Recurrent stenosis	None
Instability(Spondylolisthesis)	None
Wrong level surgery	None

Table 4: Showing Complications in Surgical Group

Stenosis Location	Sample Size
Central	47
Lateral	48
Far Lateral	32

Table 5: Location of Stenosis in Sample Population

LIMITATIONS: There are no differences at baseline in outcome variables among patients treated surgically or nonsurgically before treatment. Major limitations include the relatively small sample size. However, even with a larger sample size, the small differences in low back pain and satisfaction favouring surgical treatment would not be clinically important. Finally, since no patient underwent fusion in this study and none received instrumented fusion, it is not possible to compare fusion outcomes to those undergoing decompressive laminectomy alone or to conservative care.

Another limitation was the heterogeneity of the nonsurgical treatments. Given the limited evidence regarding efficacy of most nonsurgical treatments for spinal stenosis and individual variability in response, the creation of a limited fixed protocol for nonsurgical treatment was neither clinically feasible nor generalizable. The flexible treatment protocols allowed for individualisation of nonsurgical treatment plans reflect current practice among multidisciplinary spine practices and were consistent with published guidelines. However, this study did not assess the effect of surgery versus any specific nonsurgical treatment.

Moreover, blinding (of therapists, patients, and outcome assessors) is unfeasible in studies comparing surgical with nonsurgical procedures and the placebo effect from surgery is likely to be more powerful than the one from conservative treatment, especially among patients in whom the latter has already failed.

CONCLUSION: Radiologic stenosis correlates poorly with clinical disability. As such, a thorough clinical examination of patients with lumbar spinal stenosis, including assessment of psychosocial factors, is crucial in determining the treatment outcome. The treatment effect for surgery was seen as early as 6 weeks. Appeared to reach a maximum at 6 months, and persisted for 18 months. The condition of patients in the nonsurgical group improved only moderately during the 18 months period. Results in both groups were stable during every follow-up throughout the period of study i.e. from 6 weeks to 18 months. No catastrophic events arose among the patients receiving conservative treatment. Decompressive surgery (laminectomy) is more effective than conservative treatment for radicular pain due to lumbar spinal canal stenosis. The functional effectiveness of surgery for pain and disability was sustained and more on comparison with conservative treatment. Those treated surgically showed significantly greater improvement in terms of function and self-rated progress over 18 months compared to patients treated nonoperatively in terms of ODI index, SF 36 BP, SF 36 PF scores.

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