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Preoperative Predicting Factors for The Results of Lumbar Spinal Stenosis Surgery.

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Abstract: Clinical syndrome is caused by various causes, mainly the muscles of the brigades or the pain of the lower limbs, with or without lower back pain.
This study aimed to find out and evaluate Preoperative Predictive Factors for The Results of Lumbar Spinal Stenosis Surgery
A cross-sectional study was conducted on patients from Mosul teaching hospital and Tikrit teaching hospital for the period January 2017 to December 2020 who underwent lumbar spinal stenosis without spondylolysthesis.
In this study, 100 patients were collected, with ages ranging from 40 years to 800 years, and the patients were distributed according to gender (46 males and 54 women).
This study included 100 patients of them, 56 were female (56 %) while the other 44 were male (44%).
The body mass index was calculated for all patients and was less than 25 in 20 patients, between 25-30 in 40 patients, and more than 35 in the other 44 patients.
The other comorbidities observed were diabetes mellitus in 35 patients, ischemic heart disease in 20 patients, Hypertension in 40 patients and, depression in 40 patients, Smoking observed on eight patients.
Lumbar level involvement was L4-L5 in 38 patients, 18 patients in L3-L4, L4-L5, 17 patients in L4-L5, L5-S1 ,12 patients was in L3-L4,L4-L5,L5-S1, 6 patients in L5-S1 ,3 patients in L2-L3 , 4 patients in L2-L3,L3-L4,L4-L5,L5-S1
the study concluded that smoking, cancer or neurological complications, and longer duration of lower extremity pain were all negatively associated with patient satisfaction and good outcome; While the ability to walk better before surgery was positively related to satisfaction at the 6-month follow-up

Keyword: Lumbar, Spinal, Stenosis, Surgery, Associated, Complications, Patients.

Introduction

Some people are born with Spinal stenosis but most occurs when something happens to narrow the open space inside the spine and this is due to several reasons, including damage resulting from osteoporosis in the bones of the spine, to stimulating the formation of pores in the bones that can grow in the spinal canal, or Paget's disease - a bone disease that affects Usually adults- an overgrowth of bone in the spine [1,2].

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In severe wear symptoms in the vertebral joints, bony extensions (spondylolisthesis) form, which narrow the spinal canal as well as the nerve exit openings. Another reason is the increased thickness of the area between the vertebrae of the spinal stabilization ligaments (yellow ligament) significantly. And all these degenerative changes lead to a Ligamentum flavum in the area of the spinal canal of the spine in which the nerves pass until they are compressed together [3].

If we stick to this definition, 20% of people over 60 years of age should be considered to have this syndrome, and that is the percentage of pictures of lumbar stenosis that are observed. Therefore, to establish a diagnosis of lumbar stenosis, a double assumption must be satisfied: the presence of the clinical syndrome and confirmation by Pictures of a narrow lumbar canal [4,5,6]

There are a series of unknowns about lumbar spinal stenosis syndrome that favor confusion in the diagnosis and type of treatment indicated [7,8]. These ambiguities can be summarized as follows: 1) The prevalence and incidence of canal stenosis syndrome is unknown, although it may appear that there is a significant increase due to the increase in patients undergoing surgical treatment. 2) The intimate mechanisms of the pathophysiology of canal stenosis are unknown, particularly those that indicate the production and exacerbation of neurological symptoms [9,10]. The boundary between degenerative changes due to age and the presentation of canal stenosis syndrome is determined by the onset of clinical symptoms, which are subject to individual psychosocial and work variables. In addition, the dynamic component of lumbar duct stenosis is a difficult factor to determine [11]

The incidence and prevalence of canal stenosis syndrome is not known and the data considered are based primarily on diagnostic imaging and the number of patients undergoing surgery with this diagnosis. [12,13]

In some previous studies, the decision to perform surgery is not based solely on the results of imaging tests. Even if the imaging test results show increased pressure on the spinal cord and spinal nerve roots, the decision to perform surgery also depends on the severity of symptoms and the ability to perform normal daily activities. [14]

Patient and method

Collection sample

A cross-sectional study was conducted on patients from Mosul teaching hospital and Tikrit teaching hospital for the period January 2017 to December 2020 who underwent lumbar spinal stenosis without spondylolysthesis.

In this study, 100 patients were collected, with ages ranging from 40 years to 800 years, and the patients were distributed according to gender (46 males and 54 women).

Study design

An aging society makes lumbar spinal stenosis (LSS) the most common spinal surgery disease among the elderly. Safe, effective, and minimally invasive surgical treatment of LSS in elderly patients has long been a goal pursued by clinicians and patients. Elderly patients often have more comorbidities and decreased physiological function, which increases the risk of surgery. On the other hand, the degree of surgical trauma is also a high-risk factor for postoperative complications [5–6].

For elderly patients without lumbar instability, it is reasonable to simply decompress to relieve the main symptoms (pain in the lower extremities, difficulty walking). With the development of surgical techniques

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Inclusion criteria

- This retrospective study in Mosul teaching hospital and Tikrit teaching hospital for the period January 2017 to December 2020
- All patients with clinical and radiological feature
  lumbar spinal stenosis without spondylolysthesis.
- All patients' body mass index had calculated
- All patients' comorbidities had recorded
- Smoking habit had included
- All patients should be treated surgically
- Postoperative follow-up for at least six months for all patients

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• The improvement was evaluated using a digital pain score and clinical examination of deficiencies, and this was signed as a good improvement
• All patients with risk factors had observed and evaluated for their outcome in comparison with those who had no these factors

SPSS24.0 statistical software was used for analysis. Continuous and normally distributed data were expressed as mean ± standard deviation, and abnormal continuous data were expressed as IQR. Comparison between each time point was performed by one-way analysis of variance, and pairwise comparison was performed by LSD test; Intraclass correlation coefficient (Intraclass Correlation Coefficients, ICC) for the intra-observer reliability test (comparison of the results of 3 prints for the same observer) and the internal observer (comparison of the evaluation results of 3 observers). Assay level $\alpha = 0.05$.

Aim of study

This study aimed to find out and evaluate Preoperative Predictive Factors for The Results of Lumbar Spinal Stenosis Surgery

Results

Table 1- Demographic results of patients, N=100

Variable	Value
Age Mean (Sd)	60.9 (6.9)
BMI	29 (3.8)
comorbidities	
Hypertension, N	40
Diabetes. N	35
Heart disease, N	15
Others, N	10
ASA score >2, N	40
Sex	
Male , N	46
Female , N	54
PHQ-8 moderate to severe, N	33
Complaint duration	
<1 year	38

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1–2 year	33
>2 year	29
Comorbid depression VAS	
0-2	35
3-4	50
5-6	15
Previous spine surgery	
Yes	29
No	71
Smoking	
Yes	8
No	92

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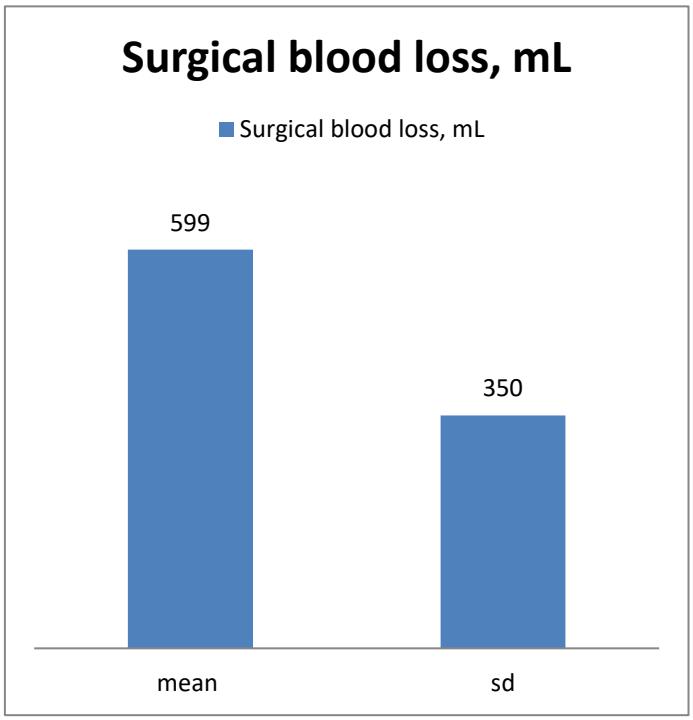
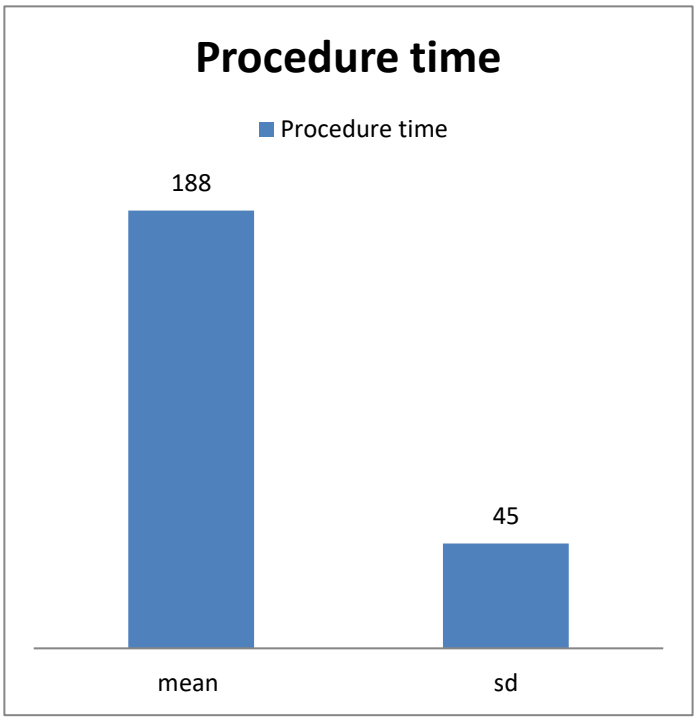
Figure 1- Describe the Surgical Details of the patient according to Procedure time, min, Surgical blood loss, mL, Surgery wait time, d





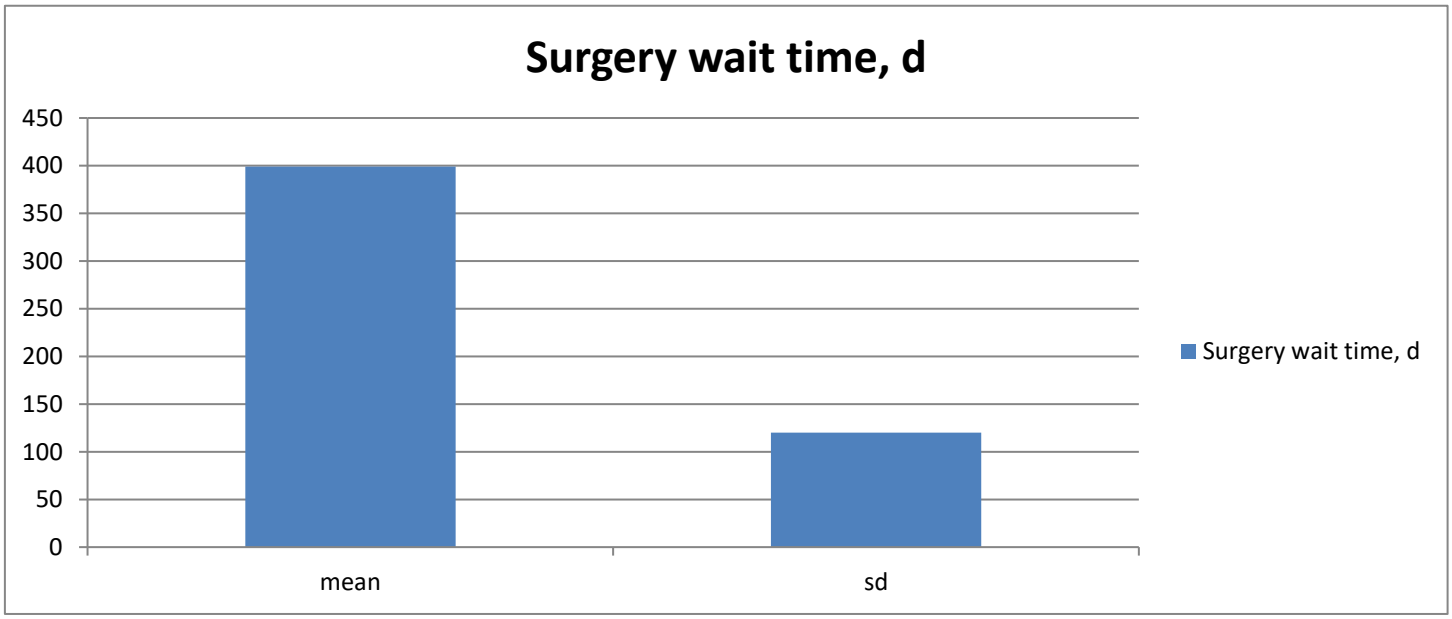


Figure 2- Outcomes of the patient according to Lumbar level involvement

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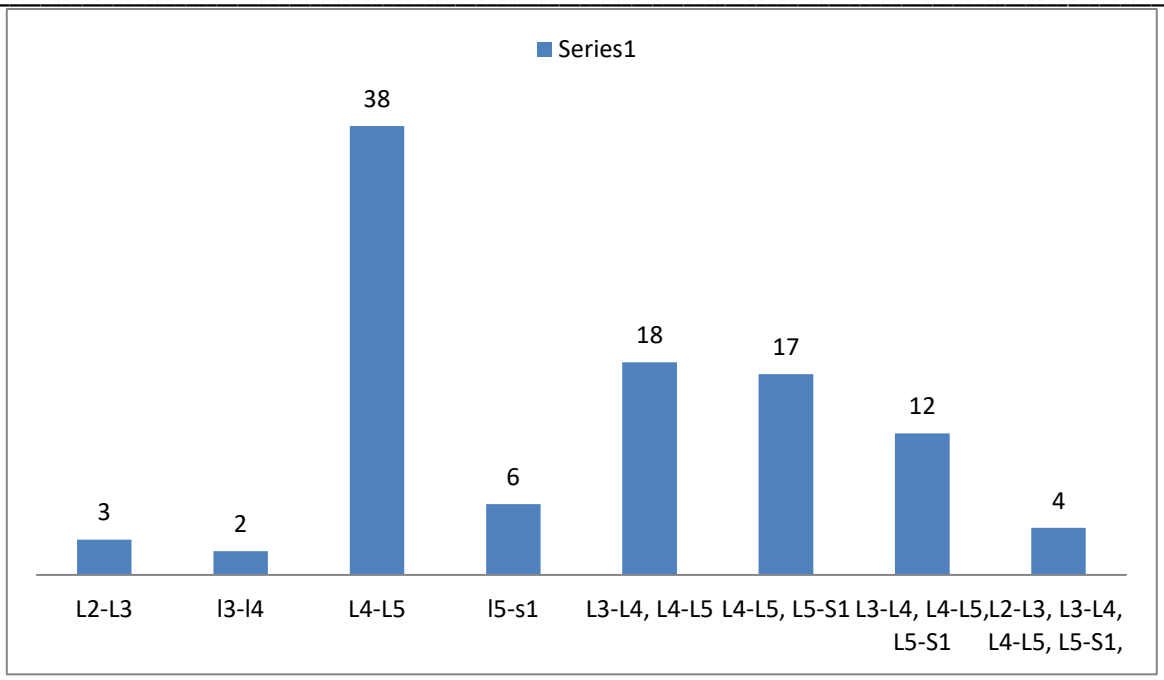

Figure 3- Clinical outcome trajectory Diagnostic to the final evaluation

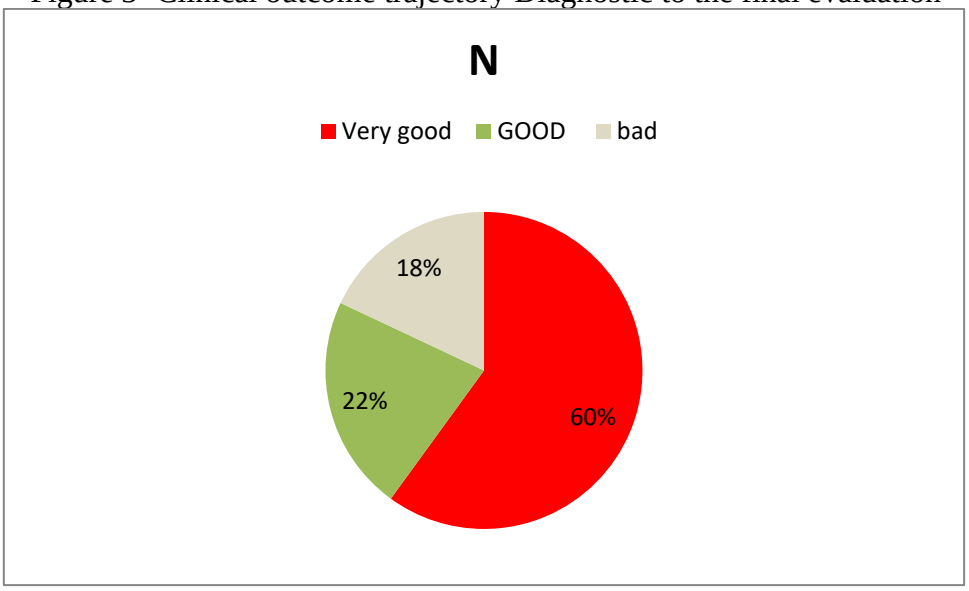

Table 2- Assessment of the MRI and VAS between our study and other study (riano hor 2001,radi fori 2010)

Variable		our study	riano hor	radi fori
good results	MEAN	2.1	1.9	2.3
	SD	0.9	0.8	0.6
bad results	MEAN	3.9	4.4	3.9
	SD	1.2	1	0.8

Figure 4- Outcome multi-trajectory groups of Postoperative follow-ups for at least six months for all patients in our study

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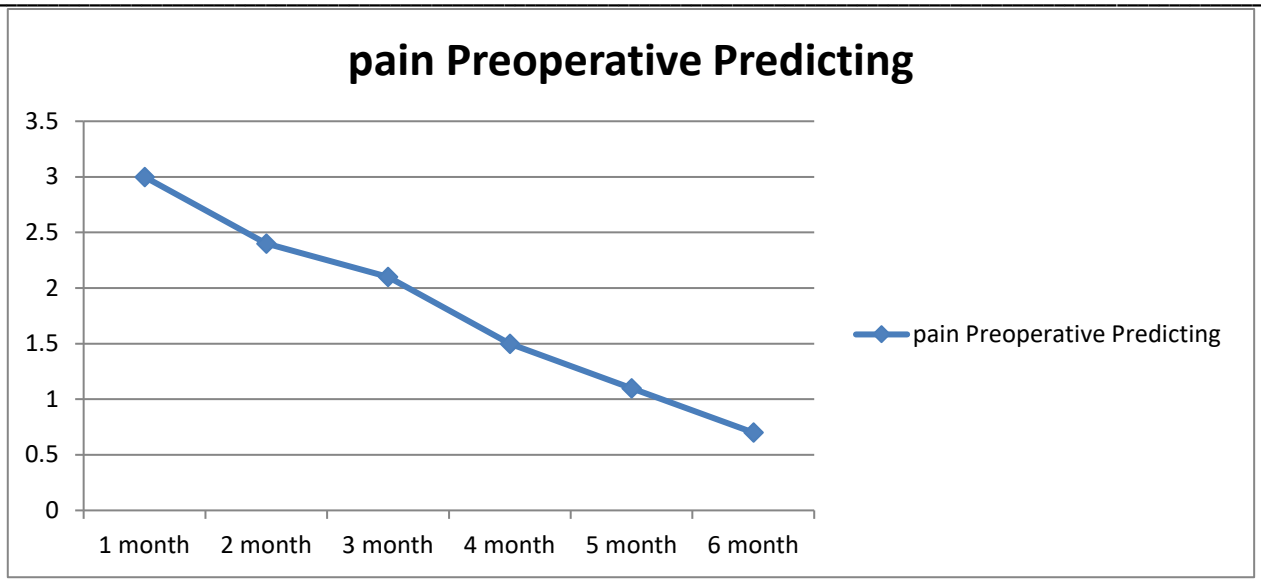

Figure 5- Outcome of multi-trajectory groups of Postoperative of bad results

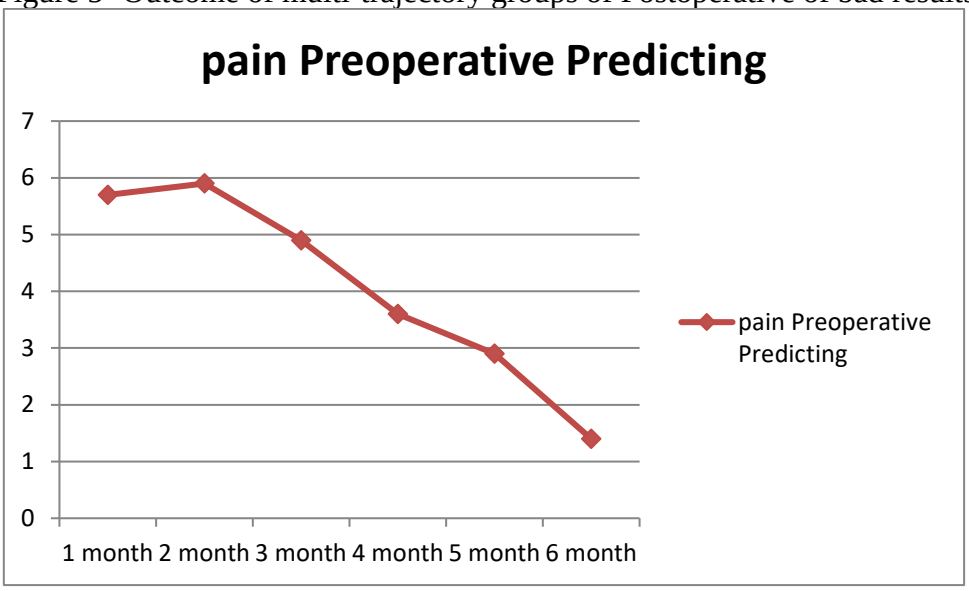

Table 3- Assessment of Multivariable Prognostic Models for risk factor

	Odds Ratio (95% CI)	P-value
Compensation	1.22 (0.87-1.44)	0.001
Age	1.7 (1.24-2.1)	0.0088
Sex, female	0.87 (0.23-1.22)	0.66
Regular preoperative exercise	1.65 (1.134-1.997)	0.022
Leg pain outcome	2.756 (1.88-3.88)	0.005
Surgery wait time	1.22 (0.88-1.49)	0.98
Pain duration >2 years	0.65 (0.24-0.89)	0.99

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Discussion

Magnetic Resonance Imaging (MRI) Scan - An MRI machine uses magnets to produce 3-D images. An MRI scan is very useful in evaluating problems with the spine because it can show nerves, soft tissues, and bones. The 3D CT images produced by MRI scans allow doctors to better understand a patient's internal structure. In this study, age was the main risk factor for spinal stenosis, with the risk of developing lumbar spinal stenosis increasing after the age of 50.

Other risk factors include previous back trauma, congenital narrowing of the lumbar spinal canal, overuse of back muscles during exercise, and metabolic bone disease.

One of the causes of lumbar spinal stenosis is spondyloarthritis, a type of osteoarthritis that affects the joints in the back of the spine. Cartilage deteriorates with age, and its smooth surface becomes rough.

As for the other reasons represented in the herniated disc - the disc can herniate without a particular reason, or it can be a cause of spinal stenosis. After the age of 30, the intervertebral discs have a chance to begin to deteriorate. Intervertebral discs become flatter and more brittle. In addition to the related causes of lumbar spinal stenosis, spinal cord tumors, trauma, Paget's disease, and achondroplasia, these are rare and will not be covered in this article. [15,16]

The purpose of the surgery is to relieve pressure on the spinal cord or nerves in order to maintain the integrity and strength of the spine. Depending on the cause of the problem, there are several types of surgery that may be performed. In general, we can divide the surgery into:

1. Posterior decompression.
2. Posterior decompression and dynamic fixation.
3. Posterior decompression and spinal fusion instrument surgery.

According to the Danish National Spine Database (Dane Spine), of the 5,807 patients who underwent lumbar spine surgery in 2015, 2,450 had lumbar spinal stenosis, accounting for 42%. According to the previous literature on LSS treatment, both surgery and conservative treatment can achieve satisfactory results. However, several recent studies have confirmed that the short- and long-term efficacy of surgical treatment is superior to non-surgical conservative treatment; [17]. However, considering the risks of surgery and some patients still hope to improve symptoms through conservative treatment, surgery is only suitable for conservative treatment, and the effect is not good for patients with severe LSS. The routine operating plan for LSS is mainly one-piece or multi-segmental laminectomy and decompression [18,19,20] and intervertebral fusion if accompanied by segmental instability. Among them, simple decompression is widely used in simple LSS due to the low incidence of perioperative complications. However, existing studies have shown that a third of patients are still not satisfied with the therapeutic effect. [21,22,23].

Conclusion

Lumbar spinal stenosis (LSS) is a clinical syndrome resulting from various causes, mainly gluteal muscle or lower extremity pain, with or without low back pain. It affects people over the age of 60, and the condition is often aggravated by prolonged walking or standing.

Finally, the study concluded that smoking, cancer or neurological complications, and longer duration of lower extremity pain were all negatively associated with patient satisfaction and good outcome; While the ability to walk better before surgery was positively related to satisfaction at the 6-month follow-up.

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