



UNILATERAL APPROACH FOR BILATERAL SPINAL MICRODECOMPRESSION IN LUMBAR SPINAL STENOSIS: SHORT TERM RESULTS

LOMBER DAR KANAL HASTALARINDA UNİLATERAL YAKLAŞIM İLE BİLATERAL MİKRODEKOMPRESYON: KISA DÖNEM SONUÇLARI

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ABSTRACT:

Objective: Lumbar spinal stenosis is a frequent cause of back and leg pain in patients over 50. Stenosis can be caused by congenital lesions or degenerative changes. Degenerative spinal stenosis may be due to intervertebral disk bulging, joint facet hypertrophy, thickening of the ligamentum flavum and spondylolisthesis.

Materials and Method: We observed 28 patients retrospectively. All patients have back and/or leg pain with neurogenic claudication. The patients were scored by numerical pain scale with zero to ten that zero is no pain and ten is the worst. During the surgeries all stenosis levels treated by unilateral approach with bilateral microdecompression.

Results: At the end of 1 month follow up, all of the patients got rid of the neurogenic claudication. The pain release rate was 86%. Many literature analysis results are similar when inspected.

Conclusions: The main point of the unilateral approach bilateral microdecompression for treating lumbar spinal stenosis is minimal invasive surgery with satisfactory decompression.

Key Words: Chronic Low Back Pain, Spinal Stenosis, Unilateral Approach Bilateral Microdecompression.

Level of evidence: Retrospective clinical study, Level III

ÖZET:

Amaç: Lomber spinal dar kanal hastalığı 50 yaş üstünde sırt e bacak ağrısının en çok görülen sebeplerinden biridir. Dar kanal konjenital lezyonlar sonucu oluşabileceği gibi dejeneratif sebeplerle de oluşabilmektedir. Dejeneratif spinal dar kanal a yol açan sebepler intervertebral diskin taşması, faset eklem hipertrofisi, ligamentum flavum hipertrofisi ve spondilolistezis olarak sayılabilir.

Materyal ve Metod: 28 hastayı retrospektif olarak inceledik. Tüm hastalarda sırt veya bacak ağrısının yanında nörojenik kladikasyo bulunmaktaydı. Hastalar 0 dan 10 a kadar olan 0 ağrısız ve 10 en çok ağrı olmak üzere numaralandırılmış ağrı skorlaması ile değerlendirildi. Cerrahi uygulanan seviyelerde unilateral yaklaşım ile bilateral mikrodekompresyon uygulandı.

Sonuçlar: Hasta takiplerinin 1. ayın sonunda tüm hastaların nörojenik kladikasyonu iyileşmişti. Ağrı azalma oranı %86 olarak bulundu. Literatürdeki çoğu çalışmayı destekler sonuçlar elde edilmiştir.

Çıkarım: Unilateral yaklaşım ile bilateral mikrodekompresyon ile tedavinin dikkat çekici noktası minimal invaziv yaklaşım ile tatmin edici dekompresyon elde edilmesidir.

Anahtar kelimeler: Kronik bel ağrısı, Spinal dar kanal, Unilateral yaklaşım ile bilateral mikrodekompresyon.

Kanıt düzeyi: Retrospektif klinik çalışma, Düzey III

INTRODUCTION:

Chronic low back pain and radiating leg pain caused by various spinal degenerative diseases such as herniated nucleus pulposus, lumbar spinal stenosis, and internal disc derangement results in decreasing function and increasing physical impairment in adults¹. Lumbar spinal stenosis is a frequent cause of back and leg pain in patients over 50⁸. Stenosis can be caused by congenital lesions or degenerative changes. Degenerative spinal stenosis may be due to intervertebral disk bulging, joint facet hypertrophy, and thickening of the ligamentum flavum or spondylolisthesis⁵.

The most objective method in diagnosing spinal stenosis is magnetic resonance imaging. Symptoms of spinal stenosis can be back and leg pain with or without neurogenic claudication. The only treatment option available to patients who fail to

respond to nonoperative therapies that may include epidural steroid injections, oral steroids, nonsteroidal antiinflammatory medication, analgesics and physical therapy is decompressive surgery^{7,9,10}.

MATERIALS AND METHOD:

We observed 28 patients retrospectively. All patients have back and/or leg pain with neurogenic claudication. The patients were scored by visual analog scale with zero to ten that zero is no pain and ten is the worst. Patients diagnosed with magnetic resonance imaging and they don't have disc herniation, vertebral fractures or listesis (Figure-1.a,b).

During the surgeries all stenosis levels treated by unilateral approach with bilateral microdecompression (Figure-2.a,b).

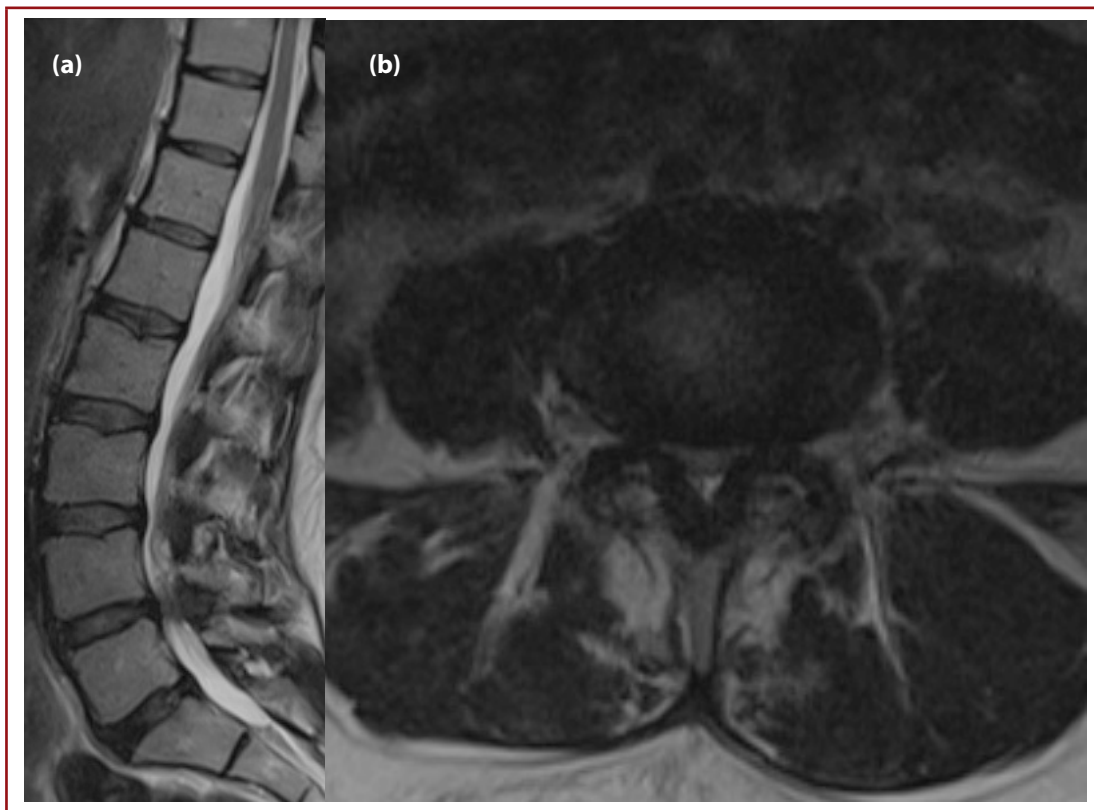


Figure-1.a,b. Preoperative magnetic resonance imaging sagittal image(left) and axial image (right).

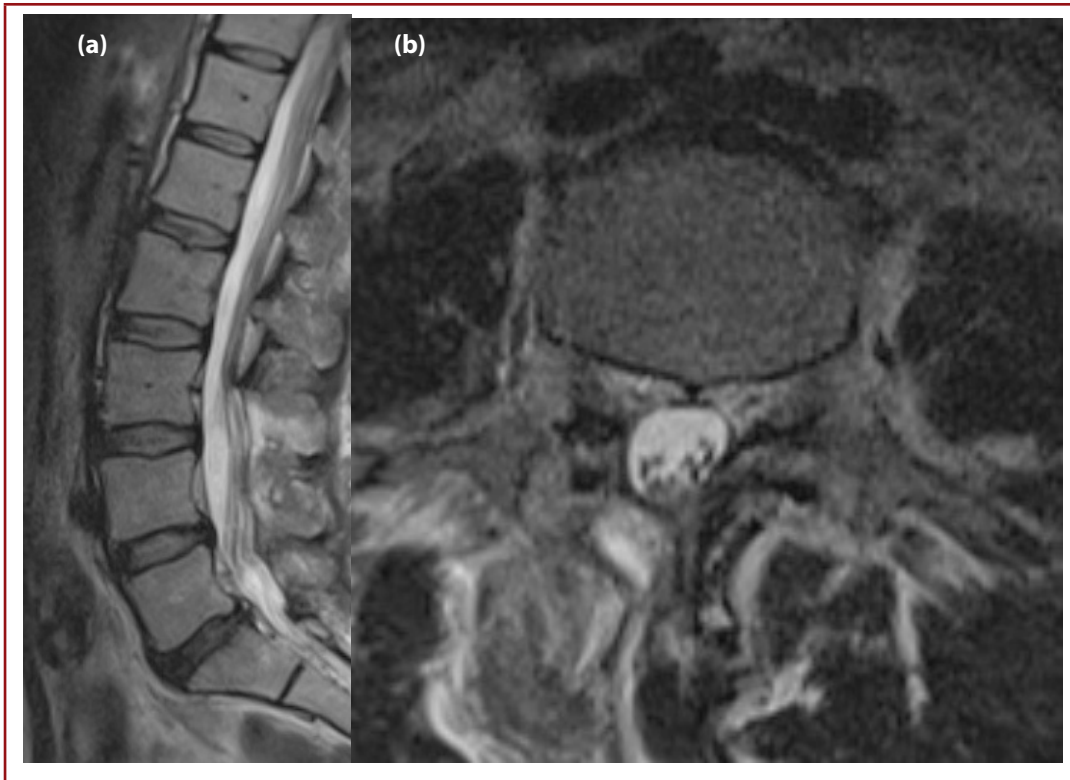


Figure-2.a,b. Postoperative magnetic resonance imaging sagittal image(left) and axial image(right)

Neither total laminectomy nor spinal instrumentation had been used. With a month of follow up the patients were scored again. The difference between the scores were calculated for pain release.

Statistical Analyses:

Descriptive data of VAS scores were presented as mean, standard deviation. The categorical variable gender was presented as frequency and percent. The comparisons between independent two groups were conducted by Mann-Whitney U test. The changes during the follow-ups were compared by using Friedman test, and when a statistically significant difference was observed, post-hoc analyses were performed by Wilcoxon test with Bonferroni correction. SPSS software version 21 (IBM Inc., USA) was used for the statistical analyses. Statistical significance level was considered as 0.05 in the analyses of this study.

RESULTS:

This study included 28 patient with a mean age of 66.4 ± 8.9 years. There were 14 patients from each gender. Mean ages of the females was 68 ± 8.8 years, and males was 64.7 ± 9.4 years.

There were no significant differences between the ages of the patients ($p=0.443$).

The mean preoperative, postoperative 1st month, and postoperative 6th month VAS values were 8.5 ± 0.6 , 1.9 ± 0.6 , and 1.6 ± 0.4 , respectively. The comparison of these were presented in Table 1. The comparisons between genders revealed that there were no significant differences between males and females ($p>0.05$ for all).

Table-1. VAS scores according to gender

	Female	Male	p
Preoperative	8.4 ± 0.9	8.5 ± 0.2	0.653
Postoperative 1 st month	1.8 ± 0.7	2.1 ± 0.4	0.222
Postoperative 6 th month	1.5 ± 0.3	1.8 ± 0.4	0.199

The VAS scores measured during the study were presented in Table-2. The overall comparisons showed that VAS scores changed during the study course ($p<0.001$). The post-hoc comparisons (Table-3) revealed that changes in postoperative 1st and 6th month scores were significant when compared with preoperative baseline values ($p=0.001$ for all). The VAS scores were significantly decreased during the follow-ups (Figure-3).

Table-2. VAS scores through the follow-ups

	Preoperative	Postoperative 1 st month	Postoperative 6 th month	P
VAS	8.5±0.6	1.9±0.6	1.6±0.4	<0.001

Table-3. Post-hoc comparisons of VAS scores

	P
Preoperative - Postoperative 1 st month	0.001
Preoperative - Postoperative 6 th month	0.001

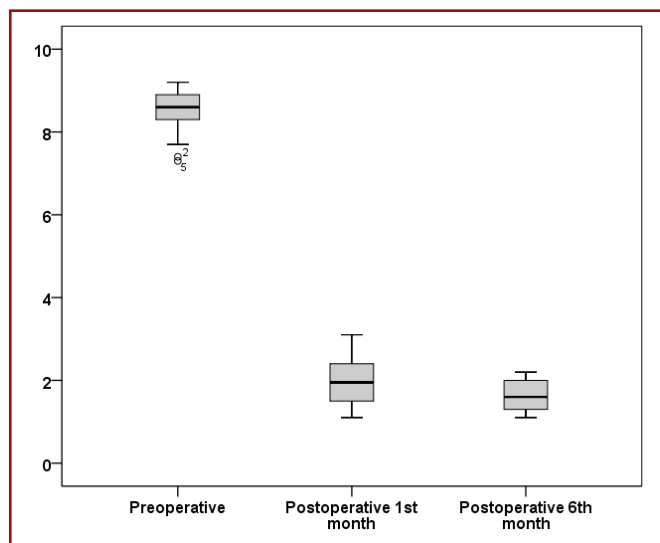


Figure-3. VAS scores through the follow-ups

DISCUSSION:

Lumbar canal stenosis is usually a disease of elderly patients. The typical clinical symptoms are chronic lower back pain radiating to the buttock, leg pain or sciatica, as well as neurogenic claudication intensifying with fatigue. Although such patients are unable to walk a long distance because of increasing numbness and leg pain, they can resume walking after squatting for a few minutes. Neuroradiological examinations including CT or MRI show reduction of the midsagittal diameter of the spinal canal to less than 12 mm and/or stenosis of the lateral recesses or the intervertebral foramen^{4,14}.

Haba et al. achieved bilateral decompression of the central and lateral lumbar spinal canal while preserving the anatomy and the biomechanical function of the posterior spinal column in a consecutive series of 450 patients. They reported a significant increase in standing time and walking distance in all patients, except for two, for up to three years postoperatively⁶.

Spetzger et al. has successfully used unilateral laminotomy and bilateral spinal canal decompression approach in the operative treatment of 29 patients with symptomatic mono or multisegmental lumbar stenosis¹². Postoperatively, 25 of the 27 patients with neurogenic claudication (93 %) demonstrated a marked improvement of the walking distance. The followup of 25 patients for 18 months demonstrated an excellent result without pain in 7 patients (28 %); a good outcome with mild residual pain, but a normal working capacity in 15 patients (60 %); and a fair outcome with unchanged postoperative lowback pain but markedly improved working capacity and walking distance in 3 patients (12 %).

Cavusoglu et al. have conducted a prospective study to evaluate the results and effectiveness of bilateral decompression via a unilateral laminectomy in 50 patients with 98 levels of degenerative lumbar spinal stenosis without instability using the Visual Analog Scale, Oswestry Disability Index, Short Form-36, and subjective Satisfaction Measurement³. Patient satisfaction rate was 94 %, and its improvement rate was 96 % with the mean followup time of 22.8 months.

Sahinoglu et al. had inspected 18 patients with spinal stenosis that treated with unilateral laminotomy bilateral decompression for 3 years¹³. They used visual analog scale and Prolo functional score for comparison. Postoperative measurements for spinal canal and scores were statistically significant for unilateral approach is useful.

Although the conventional open techniques of decompression currently remain the gold standard for treatment, problems with paraspinal musculature denervation and resultant lumbar instability have focused attention on less invasive technique². Minimally invasive surgery is crucial not only for reducing tissue trauma and patient morbidity but also for improving pain and reducing postoperative stress responses and delayed complications after otherwise uneventful procedures^{11,15}. In accordance with the current general tendency towards minimally invasive surgery, the present techniques may be

most indicated for the surgical treatment of multilevel lumbar canal stenosis in the elderly⁶.

The main point of the unilateral approach bilateral microdecompression for treating lumbar spinal stenosis is minimal invasive surgery with satisfactory decompression.

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