

## Clinical Article

# An Unappreciated Correlation : Surgical Treatment of Lumbosacral Disc Disease and Erectile Dysfunction

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**Objective :** The aim of the present study was to assess the effect of lumbar disc herniation surgery for low back pain on the erectile functioning.

**Methods :** Thirty-eight patients, with age ranging from 22 to 56 years, who had presented with pain due to herniated lumbar discs were included in the study. International Index of Erectile Function (IIEF) Short Form questionnaire was used to evaluate the erectile functioning. Patient visits on the 1st week, 1st month and 3rd month postoperatively were analyzed. Pain scores were also noted together with side effects and the complications of the surgery.

**Results :** Of the 38 patients, 18 patients had reported erectile dysfunction; 10 patients mild and 8 patients moderate erectile dysfunction. Twenty patients did not report erectile problems. The herniation levels mostly were L5-S1 in 12 (31.6%). Overall, erectile dysfunction rates have improved in 31.7% of those previously with erectile dysfunction in a 3 month period after the surgery. Best results were obtained in those patients with mild erectile dysfunction preoperatively.

**Conclusion :** Mild erectile dysfunction together with radiculopathy tends to improve after lumbosacral disc surgery. Moderate and severe erectile dysfunction may be related to a more severe nerve injury or to vascular and/or psychiatric factors. An evaluation of erectile functioning should routinely be performed in patients with lumbosacral disc disease both for data accumulation and for medico legal causes since the documentation of the correlation between erectile dysfunction and lumbosacral disc disease is still lacking.

**KEY WORDS :** Erectile dysfunction · Lumbar disc herniation · Herniation levels · International Index of Erectile Function questionnaire.

## INTRODUCTION

Lumbar disc herniation is the most common pathologic condition that is responsible for radicular pain. In patients non-responsive to medical therapy disc surgery is indicated<sup>5</sup>. There is very limited data on the correlation of clinical, neuroradiological, and surgical management of lumbar disc herniation with erectile dysfunction. Even though the interconnected pathology of neural erectile dysfunction and lumbosacral disc disease is often described in textbooks there is little to no data on the effect of lumbosacral disc surgery and recovery of erectile functioning; with only few cases reported in the literature.

In the past decade the complex structure for the erectile

mechanism was outlined. The neuroregulation of penile erection requires the coordination of parasympathetic, sympathetic and somatosensory neural pathways<sup>4</sup>. The efferent projection relevant to penile erection refers to the thoracolumbar sympathetic (T10-L2) and sacral parasympathetic (S2-S4) divisions of the autonomic nervous system, and the sacral somatic (S2-S4) nervous system. The autonomic input is primarily represented by the cavernous nerves, arising from the inferior hypogastric plexus, and the somatic input is represented by the pudendal nerves, which course from the sacral plexus. The afferent projection relevant to penile erection involves sacral innervations (S2-S4) and is represented by the dorsal nerves of the penis, sensory branches of the pudendal nerves. Lumbosacral disc disease may interfere with the nerve transmission through these pathways. Theoretically, removal of the pressure from the protruding discs with surgery should alleviate the erectile dysfunction. However, theoretical data is not well supported with clinical data<sup>6,8</sup>.

The aim of the present study was to assess the effect of

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lumbar disc herniation surgery for low back pain on the erectile dysfunction.

## MATERIALS AND METHODS

Thirty-eight consecutive male patients who have undergone lumbosacral disc surgery presenting with pain due to radiculopathy in a period of 3 months were included in the study. All patients had severe radiculopathies and thus had surgical intervention scheduled. Magnetic resonance imaging was utilized to diagnose and localize the disc disease.

All patients had preoperative erectile function evaluation using the 5 question short form of the International Index of Erectile Function Questionnaire (IIEF-5) validated for Turkish<sup>12</sup>. Patients were excluded if they had been on oral or intracavernosal medical therapy or penile prosthesis implantation for erectile dysfunction; and if they had a major prostate or colon surgery. Rosen et al. developed a shortened version of the 15-item IIEF that contained 5 items the IIEF-5 (Table 1) The items focus on erectile function and intercourse satisfaction. This was shown to be an excellent diagnostic test for erectile dysfunction. These questions correspond to questions 15, 2, 4, 5 and 7 of the original International Index. The minimum score is (1) and the maximum score is (25). The higher the score the better the erectile function. Due to limited number of patients we have evaluated those considered mild-moderate as moderately affected patients<sup>10</sup> (Appendix 1).

The same surgeon had performed all the interventions. Post-operative 1st week, 1st month and 3 month controls were noted. In the first control, all the complications and the side effects were recorded. First erectile function evaluation post-operatively was performed at 1 month post-operatively using the IIEF-5 form. At the 3rd month control, IIEF-5 scores and pain assessment using the visual analog scale as well as any side effects were noted.

Paired one-tail t-test was used for statistical analysis. Statistical significance was accepted as  $p < 0.05$ .

## RESULTS

Thirty-eight patients, with age ranging from 22 to 56 years (mean  $42 \pm 9.03$  years) who had presented

with pain due to herniated lumbar discs were included in the study. The average duration of the symptoms were  $14.8 \pm 9.3$  weeks. The herniation levels were L5-S1 in 12 patients (31.6%), L4-L5 in 18 (47.3%), L3-L4 in 8 (21.1%). Eighteen patients had reported erectile dysfunction using the IIEF questionnaire; 10 patients mild and 8 patients moderate erectile dysfunction. Twenty patients did not report erectile problems. All patients have undergone laminectomy and discectomy. All were discharged on day 1 postoperatively with no complications.

First week assessment revealed significant decrease in pain level and all patients have returned their daily routine. One patient reported mild back pain at the site of surgery that responded well to oral anti-inflammatory medications. No complications were noted. A visual analog scale (VAS), (0) being no pain and (10) being severe pain, was used to assess the pain status in the patients.

In the first month follow-up 10 patients who previously had erectile dysfunction (8 mild and 2 moderate patients) have reported normal erectile function after the surgery. Two patients reported an improvement in his erectile capacity and 6 patients did not show significant improvement

**Table 1.** Interpretation of IIEF-5 scores

Score	Interpretation
22 - 25	No erectile dysfunction
17 - 21	Mild erectile dysfunction
12 - 16	Mild to moderate ED
8 - 11	Moderate erectile dysfunction
5 - 7	Severe erectile dysfunction

**Table 2.** Patient results with reported ED

Patient No.	Age	Disc level*	Initial IIEF	1 mo IIEF	3 mo IIEF
2	31	1	19	22	22
3	45	2	9	10	9
6	56	1	8	9	8
7	45	1	20	22	23
9	48	1	17	20	22
11	41	1	18	23	23
12	37	1	16	22	22
13	37	1	19	23	22
18	50	2	11	9	10
22	45	2	9	10	9
25	56	1	8	9	8
26	45	1	20	22	23
28	48	1	17	20	22
30	41	1	18	23	23
31	37	1	16	22	22
32	37	1	19	23	22
37	50	2	11	9	10

\*Disc level (0) refers to L3-L4, (1) refers to L4-L5 disc and (2) to L5-S1. The mean IIEF-5 score preoperatively was  $15 \pm 4$ ; median 17. For the first and the third month controls the average and the median results were average  $17.5 \pm 5.8$ ; median 22 and  $17.6 \pm 6.1$ ; median 22; respectively

at the first month. None of those patients with normal preoperative erectile function reported sexual dysfunction postoperatively. All patients reported no sustained pain. There was statistically significant improvement on the group overall in terms of sexual dysfunction, the mean initial IIEF5 score was  $15 \pm 4$  and improved to  $17.5 \pm 5.8$  at the 1st mo control ( $p < 0.05$ ). The median score of 17 initially has improved to 22 at the first month control.

In the 3rd month control one patient from the normal preoperative erectile function group was lost to follow-up. Six patients marked (1) and 30 patients (0) for their pain on the VAS. Six patients still had moderate erectile dysfunction at 3 months. They were the same patients who did not report improvement at the first month follow-up. Two patients who had reported improvement at the first month follow-up had full recovery of erectile function at the third month. The statistical significance was maintained at the third month control as well, but was not different between the first and the third month controls ( $p = 0.32$ ) (Table 2).

Age and erectile function assessment correlations are summarized in Fig. 1 and correlation of disc herniation levels and erectile functions are shown in Table 3. Neurological examination findings and erectile dysfunction correlation was not found to be meaningful in terms of general motor deficit, hypoesthesia, deep tendon reflexes.

Overall, erectile dysfunction rates have improved in 31.7% of those previously with erectile dysfunction in a 3 month period after the surgery. Of those who reported normal sexual functioning post-operatively best improvement was achieved in patients with mild erectile dysfunction, two patients with moderate erectile dysfunction have

reported normal erectile functioning postoperatively.

## DISCUSSION

When a patient presents with an acute pain syndrome suggestive of a herniated lumbar disc, surgery is undertaken for intractable pain, significant or progressive neurological deficit, and abnormalities of bowel, bladder, or sexual function<sup>7</sup>. Lumbar disc surgery is highly successful and complications are extremely unusual. Recovery from disc surgery usually is uneventful, and no rehabilitation is required<sup>6,8</sup>.

Even though lumbo-sacral disc disease is frequently referred as one of the organic cause of erectile dysfunction, there is scarce evidence in the literature about the treatment outcome in terms of surgery. Braun et al.<sup>3</sup>, reported; herniated disc as one of the identifying risk factors for the development of erectile dysfunction with an incidence of 23.2%. Intradural disc herniation is a rare complication of degenerative disc disease<sup>2</sup>. A correct diagnosis of this process is frequently difficult. Vertebro-sexual correlations were studied in 120 men with low back pain. The weakness of sexual constitution in patients with radicular syndromes indicates a correlation between vertebrogenic and sexual insufficiency<sup>7</sup>.

However, there are only two papers, one being a case report, about the recovery of erectile functions post-surgery for lumbosacral disc disease<sup>2,3</sup>. This study evaluates the effect of classic disc herniation surgery on the erectile functions of sexually normal and previously dysfunctional patients, providing an insight to the importance of pre-surgical evaluation of erectile functioning.

Neural network for erectile functioning has been well documented over the last decade. Lumbosacral roots merging to form the pudendal nerves plays major role in the erection mechanism. Root compression leading to radicular pain theoretically may also impair the parasympathetic nerves that regulate the production of nerve mediated nitric oxide release and thus debilitate the erection process<sup>4</sup>.

Many of the present data come from studies performed on cauda equine syndrome. Acute cauda equina syndrome secondary to lumbar disc herniation is a rare clinical entity, but its sequelae such as bladder and sexual dysfunction are too severe to overlook<sup>1,11</sup>. There is significant sexual impairment in men with lesions of the cauda equina or conus medullaris. This is poorly correlated with neurological and EMG findings and has received insufficient medical attention<sup>9</sup>. Good surgical outcomes of early surgical intervention due to cauda equina have been reported;

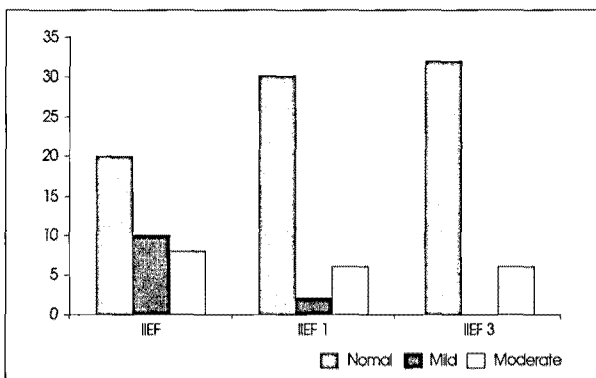


Fig. 1. Distribution of erectile functions pre- and postoperatively

Table 3. Distribution of correlation of disc herniation levels and erectile functions pre and postoperatively

	Preoperative			Month			Month		
	L3-L4	L4-L5	L5-S1	L3-L4	L4-L5	L5-S1	L3-L4	L4-L5	L5-S1
Normal	4	10	6	6	16	8	6	16	8
Mild	2	6	2	2	0	0	0	0	0
Moderate	2	2	4	0	2	4	0	2	4

however, lumbosacral disc disease only with radicular pain and erectile dysfunction have not been studied in detail.

## CONCLUSION

Mild erectile dysfunction together with radiculopathy tends to improve after lumbosacral disc surgery. Moderate erectile dysfunction may be related to a more severe nerve injury or to other factors and thus improvement after surgery may be due to other causes. Our number of patients is not sufficient to comment on the relationship of erectile recovery and the level of the disc disease, neurological deficits, pain degree or patients' age. Further studies should be planned to evaluate these interactions. An evaluation of erectile functioning should routinely be performed in patients with lumbosacral disc disease both for data accumulation and for medicolegal causes since the documentation of the correlation between erectile dysfunction and lumbosacral disc disease is still lacking.

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**APPENDIX**

**The 5-Item Version of the International Index of Erectile Dysfunction (IIEF-5)**

Purpose : To assess a male patient's erectile dysfunction using the IIEF-5 questionnaire. An abbreviated version of the IIEF.  
Please choose the appropriate column for each question about your sexual abilities over the past 4 weeks.

How do you rate your confidence that you could get an keep an erection?	Very low	Low	Moderate	High	Very high
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When you had erections with sexual stimulation, how often were your erections hard enough for penetration?	Never or almost never	A few times	Sometimes	Most times	Almost always or always
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During sexual intercourse, how often were you able to maintain your erection after you had penetrated (entered) your partner?	Never or almost never	A few times	Sometimes	Most times	Almost always or always
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During sexual intercourse, how difficult was it to maintain your erection to completion of intercourse?	Extremely difficult	Very difficult	Difficult	Slightly difficult	Not difficult
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When you attempted sexual intercourse, how often was it satisfactory for you?	Never or almost never	A few times	Sometimes	Most times	Almost always or always
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>