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

Haluk Kulaksizoglu, M.D.,¹ Hulagu Kaptan, M.D.²
Departments of Urology,¹ Neurosurgery,² Selcuk University Selcuklu Medical Faculty, Konya, Turkey

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 indicated⁵. 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 pathways⁶. 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 data⁶,⁸.

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

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 (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 ± 4 and improved to 17.5 ± 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 postoperatively 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 function7). Lumbar disc surgery is highly successful and complications are extremely unusual. Recovery from disc surgery usually is uneventful, and no rehabilitation is required8,9).

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.3), 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 disease2). 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 insufficiency7).

However, there are only two papers, one being a case report, about the recovery of erectile functions post-surgery for lumbosacral disc disease2,3). 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 process4).

Many of the present data come from studies performed on cauda equina 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 overlook1,11). 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 attention9). Good surgical outcomes of early surgical intervention due to cauda equina have been reported;
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.

References

1. Agasarov LG : [Pathogenetic mechanisms of sex disorders in the clinical picture of vertebrogenic pain syndromes.] Zh Nevropatol Psikhiat Im S S Korsakova 91 : 70-73, 1991
2. Alonso-Bartolomé P, Canga A, Vázquez-Barquero A, García-Valtuille R, Abascal F, Cerezal L : [Intradural lumbar disk hernia.] Neurologia 16 : 181-184, 2001
3. Braun M, Sommer F, Lehmacher W, Raible A, Bondarenko B, Engelmann U : [Erectile dysfunction. Are interdisciplinary diagnosis and therapy necessary?] Dtsch Med Wochenschr 129 : 131-136, 2004
4. Burnett AL : Neurophysiology of erectile function and dysfunction. In : Hellstrom W, ed. Handbook of Sexual Dysfunction. Lawrence, KS : Allen Press Inc., 12-17, 2000
5. Cakir B, Schmidt R, Reichel H, Käfer W : Lumbar disk herniation : what are reliable criterions indicative for surgery? Orthopedics 32 : 589, 2009
6. Choy DS : Early relief of erectile dysfunction after laser decompression of herniated lumbar disc. J Clin Laser Med Surg 17 : 25-27, 1999
7. Long DM : Decision making in lumbar disc disease. Clin Neurosurg 39 : 36-51, 1992
8. Orlin JR, Klevmark B : Successful disc surgery after 17 years of erectile dysfunction caused by a “silent” disc protrusion. Scand J Urol Nephrol 42 : 91-93, 2008
9. Podnar S, Oblak C, Vodusek DB : Sexual function in men with cauda equine lesions : a clinical and electromyographic study. J Neurol Neurosurg Psychiatry 73 : 715-720, 2002
10. Rosen RC, Cappelleri JC, Smith MD, Lipsky J, Peña BM : Development and evaluation of an abridged, 5-item version of the International Index of Erectile Function (IIEF-5) as a diagnostic tool for erectile dysfunction. Int J Impot Res 11 : 319-326, 1999
11. Shin DA, Kong MH, Chin DK, Cho YE, Yoon DH, Kim YS : Acute cauda equina syndrome secondary to lumbar disc herniation. J Korean Neurosurg Soc 32 : 200-203, 2002
12. Turunç T, Deveci S, Güvel S, Pekşirioğlu L : The assessment of Turkish validation with 5 question version of International Index of Erectile function (IIEF-5). Türk Uroloji Dergisi 33 : 45-49, 2007
### 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.

| Question                                                                 | Very Low | Low          | Moderate | High    | Very High |
|--------------------------------------------------------------------------|----------|--------------|----------|---------|-----------|
| How do you rate your confidence that you could get and keep an erection?|          |              |          |         |           |
| When you had erections with sexual stimulation, how often were your erections hard enough for penetration? |          |              |          |         |           |
| During sexual intercourse, how often were you able to maintain your erection after you had penetrated (entered) your partner? |          |              |          |         |           |
| During sexual intercourse, how difficult was it to maintain your erection to completion of intercourse? |          |              |          |         |           |
| When you attempted sexual intercourse, how often was it satisfactory for you? |          |              |          |         |           |

*Extremely difficult* | *Very difficult* | *Difficult* | *Slightly difficult* | *Not difficult*