

LUMBAR DISC HERNIATION

*Abdülvahap Gök

Lumbar disc herniation

Summary: Between years 1987-1991 79 patients (Neurosurgical Clinics of Gümüşsuyu military Hospital, Kırşehir Government Hospital and Gaziantep Medical Faculty) were operated with the initial diagnosis of disc herniation. The diagnosis was made by CT in 3 cases and contrast myelography in 76 cases. Although in 75 cases the surgical findings agree with the clinical and radiological diagnosis, there were 4 negative exploration. The follow-up period was from 2 months to 3 years. All the patients who had surgical pathology made an excellent and good recovery except 4 cases.

Key words: Lumbar disc, myelography

The first anatomical descriptions of intervertebral disc are credited to Vesalius in 1555. In 1770 Domenico Cotugno described sciatica but up to Lasegue's work the association between sciatica and low back pain was not recognized (3). In 1911 Goldwaith explained low back pain and paralyse due to cauda equina compression with backward crowding of the intervertebral disc (4). Mixter and Barr in 1934 explained the anatomical, pathological and clinical features of disc herniation and reported that a protruded disc was a common cause of sciatica and the pain could be relieved by removing the disc (9). At that time the

disc surgery had to be exploratory as well as therapeutic and few levels laminectomy had to be done to find the protruded disc.

In 1966 Yaşargil (10) introduced a new technique as microsurgical disc excision in disc surgery. Contrast myelography, CT and MRI are known essential radiological methods in the diagnosis of spinal pathology such as disc herniation. In this article 79 cases were evaluated with the reference to the clinical, radiological and the surgical findings.

MATERIAL AND METHOD

There were 20 women and 59 men. Age range was between 20 and 65 years. All the patients were examined neurologically and had spine films. In myelography lophendylate was used in one, lohexol (300 mgrl/ml) in 70 and lopamidol (300 mgrl/ml) in 5 patients. Up to T11 level the spinal region was investigated during myelography. Durations of complications prior to the surgery was described in table I.

RESULTS

79 cases were operated with the initial diagnosis of the disc herniation. Complete laminectomy was made in 4 cases. In 68 cases one level hemilaminectomy, in 3 cases two levels hemilaminectomy and in 4 cases three

* Department of Neurosurgery, University of Gaziantep, School of Medicine Gaziantep, Türkiye.

Table I. Duration of complaints prior to the surgery

Months	Number	%
0-1	1	1.26
2-8	25	31.64
over 8	53	67.08

Table II. Extent of the surgery

Complete laminectomy			Levels of hemilaminectomy			Levels of discectomy		
one	two	three	one	two	three	one	two	three
4	-	-	68	3	3	65	-	-

levels hemilaminectomy was made (Table II). The patients were followed-up between 2 months and 3 years. The diagnosis was made by CT in 3 cases and by contrast myelography in 76 cases. There were 4 negative exploration. 2 cases were reoperated in one month and six months after the first operation. Unilateral approach was performed in 72 cases and bilateral in 3 cases. Among them 60 cases had only disc herniation, 10 cases had bone compression, and 5 cases together with disc herniation and bone compressin

(Table III).

After the operation patients were evaluated under the following criteria:

Excellent: The patient is able to do work, no complaints or occasionally mild discomfort

Good: The patient is able to do work, mild remaining back or leg pain

Fair: The patient has to change work, partial pain relief

Table III. Relation of pathological process with the age groups

Age group	Only disc	Only bone compression	Dics herniation
			+ Bone compression
0 - 22	17	2	1
23 - 44	43	2	-
45 - 65	-	6	4

Poor: Unable to do work, worsening of the condition

After the operation 7 or 10 days later they were discharged from the hospital. The overall satisfactory result at discharge was % 96 and in % 4 complaints were the same. At late follow-up average 17 months the satisfactory results were noticed in 71 cases, fair results in 3 cases and poor result in one case. 4 case without pathology which was found in the operation were excluded. As a complication dura laceration was noticed in 4 cases and in the postoperative period thrombophlebit developed in one case (Table IV.)

Table IV. Complication during and after the disc surgery

Wound infection	% 0
Discitis	% 0
Dura Tears	% 5
Urinary infection	% 2.5
Thrombophlebit	% 1.2
Mortality	% 0

DISCUSSION

Intervertebral disc structurally is composed of cartilaginous plate, annulus fibrosus and nucleus pulposus. Many neural fibers are found in the outer part of annulus fibrosus, facet articulation and posterior longitudinal ligament, but none was seen in the central of the disc and trabecular bone (3). Within dorsal root ganglion various neuropeptides such as substance P (SP) and calcitonin gene related peptide (CGRP) are localized (8).

The pathophysiological mechanism of pain in disc herniation is not known yet, however it

may be caused by irritation of sensorial nerve fibers in annulus, lig. long. posterior or in dorsal root ganglion by chemical substances or annular tears.

More than half the patients describe injury before the onset of their complaints. Low back pain either localizes to the lumbar region, worse on exertion and better at rest or distributes to the groin and leg aggravated by sitting, standing, walking and by sneezing and straining. When the nerve root or caudal fibers were under the compression some neurological deficits in dermatomes and in motor units might be observed. These neurological abnormalities are important in localizing the lesion, in deciding surgery and in evaluation of the patients in the post operative period. 93 % of the patients had sensorial deficit, 27 % had mild motor deficit, 2,5 % had mild muscular atrophy and % 7 had no neurological abnormality.

The high frequency of disc rupture happens at both L4 - 5 and L5-S1 levels (5). In This series disc herniation was seen at L4-L5 level in 38 cases and at L5-S1 level in 27 cases. The high degree flexion, extension and spinal bending takes place at these articulation. The greatest mechanical stress at these levels may explain the high frequency of disc rupture in this area.

In 76 patients the diagnosis was made with contrast myelography. The surgical findings and myelographic appearance agree in 72 cases.

In analyzing the patients with negative exploration it was noticed that the clinical and myelography findings in three cases and only clinical finding in one case described disc herniation features.

Because of noninvasivity, greater diagnostic accuracy in lateral disc herniation, lateral res-

cess and canal shape abnormalities, CT has become invaluable in diagnosis of lumbar disc disease (3). In a prospective study with surface coil MRI, CT and myelography in herniated disc and canal stenosis cases it was found that MRI was as accurate as CT and slightly more accurate than myelography (6). It was possible to differentiate recurrent disc herniation from scar tissue with MRI and CT using contrast agents in the post operative period (11). Severe sciatic pain, an abnormal myelogram that correlates with the clinical picture, positive Lasegue sign and neurological deficit are known as the most important factors in determining a satisfactory outcome for disc surgery. It was reported that if all these factors are present, technically adequate surgery is likely to produce a satisfactory result (2).

After the follow up period of averaging 17 months, 71 patients who had herniated disc and bone compression got satisfactory, 3 fair and one poor result. The case who was in poor condition had bilateral bone compression and instability at L5-S1 level. Continue of her complaints despite of bone compression removal was attributed to instability. In the evaluation of patients who improved fairly, noticed additional pathological process was that, facet joint laxity in one case, congenital scoliosis in the second case and arachnoiditis in the third case. This last case had a lophendylate myelography and herniated disc operation a year ago in one of the neurosurgical clinics. Due to his same complaints on the same side after evaluation with lodoxol myelography, he underwent the second operation.

Despite lig. flavum and bone compression removal his occasional complaints continued. The satisfactory results was reported by Cashion and Lynck (1) as 62 % by Salenius and Laurent (7) as 56 % in herniated disc cases. No recurrence was observed in any patients

in the following period. In 2 cases that had a second operation fibrotic mass on and around the dura was removed in one case and bone compression removed in the other. One year after the second operation they were free of the complaints.

The result of disc surgery depends not only upon operative technic and skill, the degree of neurological impairment but also upon the correct selection of cases.

References

1. Cashion EI, Lynck WJ: *Personality factors and results of Lumbar Disc Surgery. Neurosurgery* 4: 141-145, 1979.
2. Finneson BE: *Lumbar Disc Excision. Operative Neurosurgical Techniques Vol 2. Edited by Schimidt HH and Sweet WH. Grune and Stratton Inc. New York 1982, pp 1283-1310.*
3. Hardy RW, Davis CH: *Extradural spinal cord and nerve root compression from benign lesions of the lumbar area. Neurological Surgery. Vol 4. Edited by Youmans JR. WB Saunders Company. Philadelphia 1990, pp 2664-2693.*
4. Hlavin ML, Hardy RW: *Lumbar disc disease. Neurosurgery Quarterly* 1: 29-53, 1991.
5. Jennett B: *Proapsed Intervertebral Disc. An introduction to Neurosurgery, Willam Heinemann Medical Books Limited. London 1977, pp 302-316.*
6. Modic MT, Masaryk T, Boumprey F, et al: *Lumbar Herniated Disc Disease Canal Stenosis: Prospective Evaluation by surface coil MR, CT and myelography. AJR* 147: 757-765 1986.
7. Salenius P, Laurent LE: *Results of Operative Treatment of Lumbar Disc Herniation. A*

survey of 886 patients. **Acta Orthop Scand.** 48 (6): 630-634 1977.

8. Weinstein J: Neurogenic and Nonneurogenic Pain and Inflammatory Mediators. **Ortho Clin North Am.** 22 (2): 235-246 1991.

9. Wilson DH, Harbaugh R: Microsurgical Disc Excision. *Operative Neurosurgical Techniques. Vol 2. Edited by Schimidek HH and Sweet WH. Grune and Stratton Inc. New York 1982, pp 1311-1318.*

10. Yaşargil MG: Microsurgical operation of herniated lumbar disc. **Advances in Neurosurgery** 4: 81-81 1977.

11. Zimmerman RD, WeingartenK, Johnson CE, et all: Neuroradiology of the spine. **Neurological Surgery.** Vol 4. Edited by Youmans JR. WB Saunders Company. Philadelphia 1990, pp 364-404