

# Failed Back Surgery Syndrome in Lumbar Disc Herniation: The Retrospective Analysis of Success Scorings of Epidural Fibrosis and Recurrent Cases in Reoperations

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## ABSTRACT

**Aim:** In this work, failed back surgery syndrome (FBSS) which observed in lumbar disc herniation (DH) postoperatively is analysed; and especially epidural fibrosis and recurrent cases are retrospectively analysed through calculating the success scores.

**Method:** Our work had been carried out between January/2000 - December/2006. In our clinic, 1268 cases in total were examined that were operated by reason of lumbar disc herniation in our clinic. Among the cases that were included to the study, the 70 were evaluated as FBSS and the radiological evidences, surgical and clinical findings were analysed retrospectively.

**Result:** Of all the patients 36 were women (51%), the 34 were male (48.6 %). Their ages changed between 22-74 and the age average was found as 49.9. Of all the reoperated cases; the 45 (64%) were reoperated by reason of recurrent DH, 9 (12.8%) epidural fibrosis and recurrent DH, 8 (11.4%) paraspinal abse, 3 (4.2%) lumbar stenosis, 3 (4.2%) foraminal stenosis, 1 (1.4%) postoperative discitis, 1 (1.4%) Cerebro spinal fluid (CSF) fistule. While the success rate of the cases with epidural fibrosis was found as 37.2 % ; 75.9% success rate was recorded for the patients with recurrent DH. Statistical comparison was found as meaningful. ( $p < 0.05$ )

**Conclusion:** The most frequent reoperation cause for the patients who were operated by reason of lumbar DH is the recurrent herniations which occur at the same level; the same side or the opposite side. The cases with epidural fibrosis must be well-assessed radiologically and clinically and the most effective treatment plan should be aimed and formed.

**Key words:** Failed back surgery, recurrent disc herniation, epidural fibrosis

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## Lomber Disk Herniasyonunda Başarısız Bel Cerrahisi; Epidural Fibrozis ve Nüks Olgularının Reoperasyondaki Başarı Skorlamasının Retrospektif İncelenmesi

**Amaç:** Bu çalışmada Lomber DH cerrahisi sonrası görülen BBC, özellikle epidural fibrozis ve nüks olgularının reoperasyondaki başarı skorlamaları yapılarak retrospektif olarak incelenmiştir.

**Metod:** Çalışmamız Ocak 2000- Aralık 2006 tarihleri arasında kliniğimizde lomber disk hernisi nedeniyle opere edilen toplam 1268 olguda yapıldı. Çalışmaya dahil edilen olgular arasında 70 olgu BBC olarak değerlendirilip radyolojik bulguları, ameliyat bulguları ve klinik bulguları retrospektif olarak analiz edildi.

**Bulgular:** Olguların 36'sı kadın (%51.4), 34'ü erkek (%48.6), yaş sınırı 22-74 arasında olup, yaş ortalaması 49.9 bulundu. 45'i (%64) nüks DH, 9'u (%12.8) epidural fibrozis ve nüks DH, 8'i (%11.4) paraspinal abse, 1'i (%1.4) postoperatif diskitis, 3'ü (%4.2) darkanal, 3'ü (%4.2) foraminal stenoz, 1'i (%1.4) de BOS fistülü nedeni ile reopere edildi. Reopere edilen epidural fibrozisli vakalarda başarı oranı % 37.3 bulunurken, nüks DH lerede ise %75.9 olarak bulundu. İstatistiksel karşılaştırılması anlamlı bulundu ( $p<0.05$ ).

**Sonuç:** Lomber DH operasyonu geçiren hastalarda en sık (%64) reoperasyon sebebi aynı seviyede, aynı taraf veya karşı tarafta oluşan nüks disk hernileridir epidural fibrozis bulunan olgular radyolojik ve klinik olarak çok iyi değerlendirmeli en uygun tedavi planı amaçlanmalıdır.

**Anahtar kelimeler:** Başarısız bel cerrahisi, nüks disk hernisi, epidural fibrozis

## INTRODUCTION

This problem usually observed in people between 40-50 ages; especially the ones, working for industry and services sector encounter low back pain more (2). In the USA 7 million new low back pain sufferer appear each year and 200.000 of them are applied Lomber spinal surgery. 20% of them are reoperated by reason of lasting pain (1).

Among the all low back pain types, the 2-3% develop by reason of Lomber Disc Herniation (DH) (3). New developments in the area of diagnostic testing methods serve much to raising diagnosis rates of lomber DH and also thanks to new technological improvements, surgical methods vary and develop (4). In the USA 200.000 people operated by reason of Lomber DH in a year and this fact implies the significance of retrospective and prospective studies to be carried out for this type of surgery.

Lomber DH is mostly seen in middle aged people . While 70% of all cases are of 30-50 ages, 10% of them meet the disease after sixty years (5). However Lomber DH is rarely seen in early ages (6). 15% of all Lomber DH are applied surgical methods. Although the surgical success rate is about 90% in lomber DH many studies in literature were carried out in order to find out what sort of treatment plan should be developed for the patients whose pain still come to no end (7,8). Although these hard studies, there is no standardized approach or operation procedure formed for failed back surgery syndrome (FBSS) (7). Despite it changes among the series; today, the incidence of recurrent Lomber DH is announced as 4 %.

## MATERIALS AND METHODS

We researched 1268 Lomber DH cases in total, operated in second brain surgery clinic in Prof. Dr Mazhar Osman Bakirkoy Ruh Sagligi ve Sinir Hastaliklari Hospital in January 2000-December 2006. 1145 cases were included to the study that were operated in our clinic and visited us for being checked regularly. 123 cases were not studied because they did not come for being checked. Among the all cases included to the study 70 cases were evaluated as FBSS and analysed retrospectively. FBSS were accepted as the cases which were in worse condition than their former preoperation status or were not better postoperatively. Radiological diagnostic examination methods, such as; direct lomber graphies, dynamic graphies for the ones who would have suffered from instability or pars defect, ( flexion, extension and normal lomber graphies), Computerized tomography (CT) and Magnetic Resonans Image (MRI) were applied to all cases before surgery. It was aimed to have an idea about the bone area; hemylamynotomy, hemylamynectomy, laminectomy, taken in the former surgery; and especially facet joints (facet hypertrophia, medial facetectomy, total facetectomy) examined carefully.

Through Lomber MRI examination; fibrosis existence or absence was searched especially in the image with contrast fluid; it was questioned if there was recurrent herniation or not; Cerebro Spinal Fluid (CSF) existence or absence related to dural damage were carefully analysed, it was searched if there were materials related to disc infection or not . The cases with DH on the same or opposite side of primer DH level were assessed as relapse.

Table 1. JOA Classification

<b>1-Subjective Symptoms</b>	<b>9 score</b>		
A-Low back pain			
a-None			3
b-Occasional mild pain			2
c-Frequent mild			1
d-Occasional severe pain			0
B-Leg pain			
a-None			3
b-Occasional slight symptoms			2
c-Frequent slight symptoms			1
d-Frequent severe symptoms			0
C-Gait			
a-Normal			3
b-Able to walk > 500 meters but painful			2
c-Unable to walk > 500 meters			1
d-Unable to walk > 100 meters			0
<b>2-Clinical Symptoms</b>	<b>6 scores</b>		
A-Straight leg raising			
a-Normal (> 70 angle )			2
b-30 to 70 angle			1
c-<30 angle			0
B-Sensory disturbance			
a-None			2
b-Slight disturbance			1
c-Marked disturbance			0
C-Motor disturbance			
a-Normal			2
b-Sligh weakness (4 puan)			1
c-Marked weakness(0-3 puan)			0
3-Urinary bladder function			
A-Normal			0
B-Mild dysuria			-3
C-Severe dysuria			-6
<b>4-Restraining daily life activities</b>	<b>14 scores</b>		
	<b>Severe pain</b>	<b>stight pain</b>	<b>Paintess</b>
A-Turn over while lying	0	1	2
B-Standing	0	1	2
C-Washing	0	1	2
D-Sitting (1 Hour)	0	1	2
F-Lifting or holding object	0	1	2
G-Walking	0	1	2
H-Leaning forward	0	1	2

The age, sex, radiological and clinical diagnosis, surgical enterprise techniques, examination materials, operation notes of FBSS cases were analysed retrospectively. Japanese Orthopaedic Association (JOA) Scoring (9) was used for evaluation of preoperative clinical symptoms of the FBSS cases (Table 1). The evaluation of surgical result was made according to the preoperative and postoperative JOA scores comparison. Surgical Assessment: (postop JOA score - preop JOA score) / (29- preop JOA score) x100%. In our study, statistical analysis of cases Student-T and Ki Square (x2) were used in SSPS computer programme.

## RESULTS

Of all the cases; 36 were women (51.4%) and 34 were male (48.6%). Ages change from 22 to 74 and average of ages was 49.9. The onset of symptoms of FBSS cases changed from 15 days to 48 months; and the average was found as 8 months.

We analysed 70 cases in total that were operated because of FBSS. The 45 (64%) were of recurrent DH, 9 (12.8%) epidural fibrosis and recurrent DH, 8 (11.4%) paraspinal abse, 1 (1.4%) postoperative discitis, 3 (4.2%)

**Table 2.** The ethiopathogenesis distribution of FBSS cases

Ethiopathogenesis	n	%
Recurrent DH	45	64
Epidural Fibrosis	9	12.8
Paraspinal abse	8	11.4
Paraspinal abse	1	1.4
Lumbar stenosis	3	4.2
Foraminal stenosis	3	4.2
CSF Fistule	1	1.4

lomber stenosis, 3 (4.2%) foraminal stenosis, 1(1.4%) CSF fistule (Table 2). The cases with recurrent DH were to be reoperated and to achieve this former hemylaminectomy area was partially widened and then discectomy and foraminotomy were applied. When the cases who were operated by reason of recurrent DH analysed, it was observed that 26 (37%)of patients operated by left L4-L5 distance, and 17 (24.2%) right L4-L5, 8 (11.4%) left L5-S1, 10 (14.2%) left L5-S1, 4 (5%) right L3-L4, 4 (5%) left L3-L4 and 1 (1.4%) L2-L3.

Postoperative success rate analysis of the FBSS cases, is done by taking sexes into consideration; as a result, 66.28% was reported for male patients and 66.98% was reported for women. The statistical comparison of the rates was meaningless ( $p>0.05$ ). Success rate according to the JOA scoring; was found as 37.3% for the cases with epidural fibrosis. For the cases with recurrent DH the success rate was %75.9. Statistical comparison was found as meaningful. ( $p<0.05$ ) (Table 3)

## DISCUSSION

T However there is no accurate definition of failed back surgery syndrome, there are many expressed in literature. According to a definition on which many neurosurgeons agree; FBSS is mentioned on the condition that back surgery fails to meet expectations, objectives and

aims of a patient before the operation (10). However FBSS is accurately mentioned for the patients whose condition is worse than primer preoperation status, or who cannot reach better condition. In 1981, Burton and his friends expressed that they found the reasons of FBSS as; 58% lateral stenosis, 7-14% central stenosis, 16% recurrent DH, 6-16% arachnoiditis and 6-8% epidural fibrosis (11).

Fritch and his friends reoperated 136 cases with FBSS after classic laminectomy and discectomy and they expressed that in those 136 cases in total; 62% were with recurrent DH; 23% different level DH, 12% instability, %5 fibrosis (12). In our study, in 45 patients of all FBSS cases, recurrent DH was fixed as the reason of FBSS (64.2%). Literature contains different views on definition of recurrent DH. Recurrent DH is expressed as the development of DH, on the same level, same part, or on the opposite part (13, 14, 15). Some other researchers defined different-level herniation as recurrent DH (16).

The major complaint of the cases in our study was radicular pain. 10 cases had neurological intermittent claudication. It is stated that; this clinical symptom; the radicular pain, develops as secondary the spinal canal degeneration (17). Long lasting studies on recurrent DH indicate that many different factors effect prognosis. In Finnegan and his friends' study it is expressed that symptoms which occur less than one year or six months have better prognosis (18).

Some writers indicate that, in recurrent DH, there is no need to additional discectomy, only the removal of extruded DH is enough (19). However Baba and his friends express that annulus and nucleus have to be removed as much as possible (20). It is also stated that radical discectomy decreases disc function and lead patients experience postoperative back pain more (19). Epidural fibrosis is detected as the second FBSS cause (12.8%) in our study. While the success rate of the cases with epidural fibrosis is 37.4%, it is 75.9% in the cases of recurrent DH without fibrosis. This fact points out that

**Table 3.** The comparison of JOA scores of FBSS cases

	Recurrent DH			Epidural fibrosis			p
	n	JOA Score	%	n	JOA Score	%	
Preoperative	45	8.33		9	11.62		
Postoperative	45	23.4	75.9	9	18.12	37.3	0.00*

\* Student-t:  $p<0.05$

success rate is decreasing in the cases that are operated after the fibrosis tissue occurred. On this account, in the radiological examination; the FBSS cases with noticeable epidural fibrosis formation must be well assessed prior to operation. In the analysis of Lumbar MRI with contrast fluid; the distinction between epidural fibrosis and recurrent DH is made about the rate 89%. Braveman and his friends reported that, in the cases they operated by reason of epidural fibrosis, the success rate was reported as 30-35%. It was also reported that they fixed bad result in 10- 20% of the cases (21).

After lumbar discectomy, different level epidural fibrosis developed in almost all cases. As wound healing happens fibrotic tissue occurs instead of epidural adiposit tissue (22). The semi-fluid structure of epidural adiposit tissue helps dura and nerve roots smoothly and regularly move with spine without straining or compression. The loss or decrease of epidural adiposit dokusu after lumbar disc surgery and the formation of epidural fibrosis causes straining and compression in dura and nerve root. Many materials and procedures were developed in order to prevent fibrosis formation after lumbar discectomy. One of those methods is usage of otograft adiposit tissue (23,24).

But the histological differences between epidural and subcutaneous adiposit tissue lead to take dissatisfying results (25,26). In some studies it is stated that usage of minimal invasive surgery methods and, meticulous and very careful supplication of hemostasis decrease the formation of epidural fibrosis (26). Another study states that, powder in surgery gloves and cottons that are put in the epidural area take role in the formation of epidural fibrosis (27). Many synthetic materials are also tested in order to checking the epidural fibrosis after lumbar surgery.(28,29) In the comparative experimental studies; it is reported that Vicryl Mesh prevent epidural fibrosis (30).

Some studies claim that through the usage of ADCON-L synthetic material, postoperative fibrosis formation can be prevented (31). However it is reported that through the usage of ADCON-L, CSF leak was observed (32,33). In Ozer and his friends' study, the protection of ligamentum flavum throughout the operation, meaningfully decreased epidural fibrosis (22). Foraminal stenosis is another FBSS reason that is found out in our study. 6 (8.4%) of 70 cases were reoperated because of foraminal stenosis. In Burton and his friends' study, the foraminal ste-

nosis rate was reported as 57-58% (11). In Waguespack and his friends' study this rate was reported as 29% (10)

Postoperative discitis and paraspinal abscess were detected as other reasons of FBSS. Infection was observed in 10 (13%) of all cases in our series. *Staphylococcus aureus* was produced bacteriologically in the two of the cases who have postoperative discitis and paraspinal abscess. Although postoperative discitis was reported to be observed as 0-3% in different series prior MRI, it was reported that, this rate observed to be increased with the common usage of MRI.

In conclusion, recurrent disc herniation; which occur on the same level, the same side or opposite side, is the most frequently observed (64%) reoperation cause in the patients on whom Lumbar DH surgery applied. Epidural fibrosis formation is secondly frequent cause (12.8%) of reoperation. While the success rate of all failed back surgery syndrome cases is found as 37.3% for the patients with epidural fibrosis and 75.9% is reported for the patients without fibrosis. The statistical comparison is found as meaningful of these success rates. ( $p < 0.05$ ). Therefore, the cases with epidural fibrosis have to be well-assessed radiologically and clinically, and the best treatment plan should be aimed and formed. In order to prevent epidural fibrosis; minimal invasive surgery techniques have to be applied and careful hemostasis is to be supplied.

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