

## A prospective study on functional outcome of Percutaneous Epiduroscopic Adhesiolysis compared to lumbar spine surgery for treatment of Failed Back Lumbar Syndrome caused by Fibrosis-Adhesion

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### Abstract

**B** **Background:** Epidural fibrosis and adhesion seen as common post lumbar syndrome phenomena which contribute to 50%-60% recurrent of the symptoms.

**Aim of study:** We studied the effectiveness of percutaneous epiduroscopic adhesiolysis in management of fibrosis & adhesion resultant from failed backed lumbar spine surgery compared to second time surgical decompression with surgical excision of the fibrosis of lumbar spinal stenosis.

**Patients & Methods:** In a prospective comparative study of 44 patients all of them with failed backed post laminectomy syndrome were diagnosed in Sulaimania city private clinic and private hospital, from June 2010 till May 2012 according to magnetic resonance imaging techniques, also according to inclusion exclusion criteria in diagnosis of adhesion with fibrosis, were randomized into two groups. Group A treated by lumbar spine surgery with second time surgical exploration, decompression and excision of fibrosis compared to the second group B were treated by percutaneous epiduroscopic adhesiolysis through sacral canal under fluoroscopic guide. The caudal epidurogram showed restriction in spread of contrast caused by fibrosis & adhesion then the canal open by irrigation through pressurized saline range from 40 to 80 ml according to the number of the level which were obstructed by fibrosis. Saline used intermittently until the spinal canal open were seen by fluoroscope until complete procedure with adequate adhesiolysis with visualization of the canal opening. At the end of the procedure solutions were used to decrease rate of adhesion. Depomedrol 80 mg 2ml, Hyaluronate 6ml, 1% 5ml lignocaine injected into canal space.

**Results & Discussion:** In both group A by surgical procedure & B percutaneous epiduroscopic adhesiolysis were noticed significant improvement in the mean of Stanford score and ODI (Oswestry low back disability score) from baseline were at all follow up visit for 24 Months according to sciatica pain (short term less than 6 Months, long term more than 6 Months), Functional outcome, Return back to work, psychological status, Change in narcotic intake, with the general satisfaction rate. Also there were significant statistical differences at 12, 24 Months follow up for both Stanford and ODI Oswestry index between group A and group B revealed high outcome results for group B was treated by epiduroscopic adhesiolysis technique (P- value <0.0001) with minimal complications rate in group B compared to group A.

**Conclusion:** We concluded that percutaneous epiduroscopic adhesiolysis for 2 years follow up specific for the patients of fibrosis with adhesion post laminectomy are superior to the surgical exploration with excision of fibrosis & second time decompression in treatment of failed back lumbar spinal surgery.

### Introduction

For Study and Evaluate the Functional Outcome of Epiduroscopic Adhesiolysis

Compared to Lumbar Spinal Surgery for Treatment of Failed Back Lumbar Spine Syndrome Caused by Fibrosis-Adhesion. In the 1930s, Burman<sup>1, 2</sup> applied

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Myelography to observation of the subarachnoid space in cadavers. Saberski and Kitahata subsequently developed an epidural endoscope, and it has now become possible to insert a video-guided catheter with an external diameter of 0.9 mm and a fiberoptic scope for direct observation of the epidural space through the sacral hiatus<sup>3, 4, 5</sup>.

### **What is Epiduroscopic/Adhesiolysis**

Epiduroscopy is a method of directly visualizing and potentially treating pain generators inside of the spinal column, using a small flexible fiberoptic scope is inserted through a tiny incision and pass through Sacral Canal will seen in fig 4. The areas of concern can be visualized on a video monitor then Medication can be injected through the same catheter<sup>6, 7, 8</sup>.

In this procedure we study the effectiveness of percutaneous Epiduroscopic Adhesiolysis in management of fibrosis & adhesion resultant from failed backed lumbar spine surgery compared to second time surgical decompression with the surgical excision of the fibrosis of lumbar spinal stenosis from this Surgical technique can confirm which is Superior in management of Epidural fibrosis and adhesion seen as common post lumbar syndrome phenomena. Specific to surgical technique that confirmed after exclusion other causes that lead to recurrent of symptoms<sup>9, 7, 3</sup>.

Epidurography is both a diagnostic and treatment tool fig 3 will seen epidurogram visualize the canal. It is used to assess the structure of the epidural space in the spine by injecting contrast dye under fluoroscopic guidance. This procedure is usually also done before epidural steroids are administered to ensure accurate delivery of therapeutic material to the source of your pain. The procedure is used in the detection of herniated discs that are not seen with myelography<sup>1, 3, 5</sup>.

Failed back surgery syndrome (FBSS) refers to a condition in which the

symptoms remain unchanged or worsen after surgery for lesions of the vertebrae, or interference in daily life remains. It is a syndrome of intractable chronic pain for which no effective treatment has been established. The cause of this condition remains unclear, but has been variously attributed to adhesions in the epidural space after back surgery, physical obstruction of the peripheral nerves, and nerve root damage<sup>11, 12, 13, 14</sup>.

Epidural fibrosis and adhesion seen as common post lumbar syndrome phenomena which contribute to 50%-60% recurrent of the symptoms. The incidence of FBSS after spinal lumbar surgery is estimated to range from 5% to 50% In the USA, 37000 new cases of FBSS occur each year, the causes of FBSS development include scar formation and adhesion in the epidural space<sup>15, 16, 17, 18</sup>.

### **Patients & Method**

In a prospective comparative study of 44 patients all of them with failed backed post laminectomy syndrome were diagnosed in Sulaimania city private clinic and private hospital from June 2010 till May 2012 according to magnetic resonance imaging techniques, also according to inclusion exclusion criteria in diagnosis of adhesion with fibrosis, were randomized into two groups.

**Procedure:** Group A; 22 patients treated by second time lumbar spine surgical exploration with excision of fibrosis-adhesion. Group B; 22 patients Through sacral canal with Epiduroscope fig 4, caudal epidurogram fig 3 showed restriction in spread of contrast caused by fibrosis & adhesion then the canal will be opened by irrigation through pressurized saline range from 40 -80 ml according to the size & level which were obstructed by fibrosis were seen in fig 1, 2 .



**Fig. 1 X ray; Post-Surgical L4+ L5 Laminectomy**



**Fig. 2 Fibrosis- Adhesion Post-Operative L4+L5 Fibrosis**

#### **Procedure;**

- 1% 5ml lignocaine injected locally into skin and soft tissue around canal space.
- Saline used intermittently until the spinal canal open were seen by fluoroscope –fluorogram, until complete procedure with adequate adhesiolysis through visualization of the canal opening also saline mixed with 2- 3 ml Marcaine .

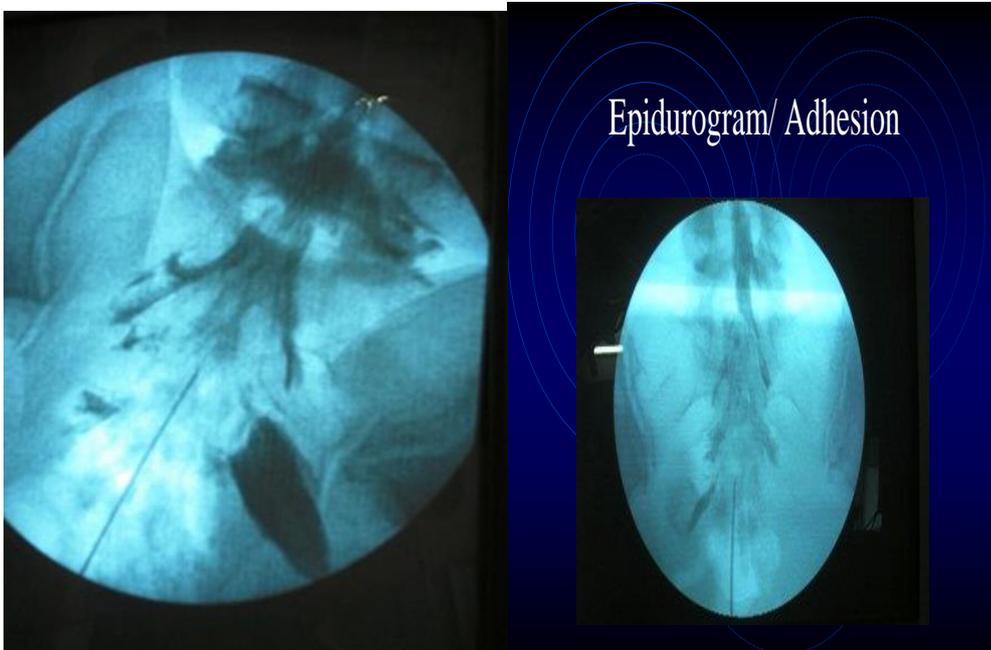
- At The End of the Procedure Solutions Were Used to Decrease Rate of Re Adhesion; Depomedrol 80 mg 2ml, Hyaluronate from 3ml to 6ml according to the level of adhesion were seen in fig 5, 6.

#### **Results**

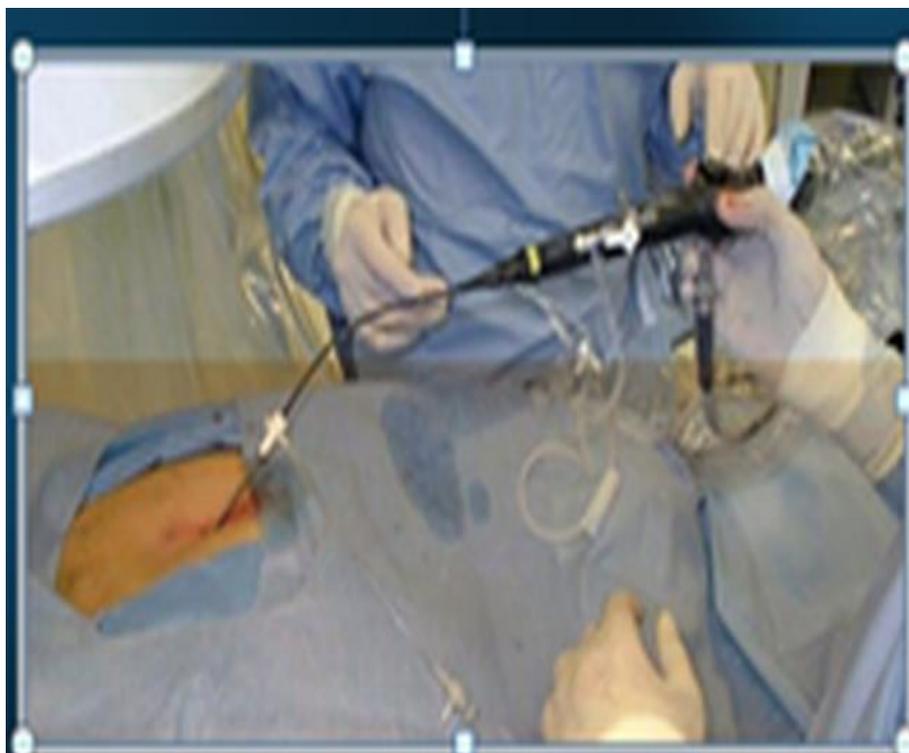
In both group A by surgical procedure in table 1 & B epiduroscopic adhesiolysis

table 2 were noticed significant improvement in the mean of Stanford score and ODI (Oswestry low back disability score) from baseline were at all follow up visit for 24 Months according to;

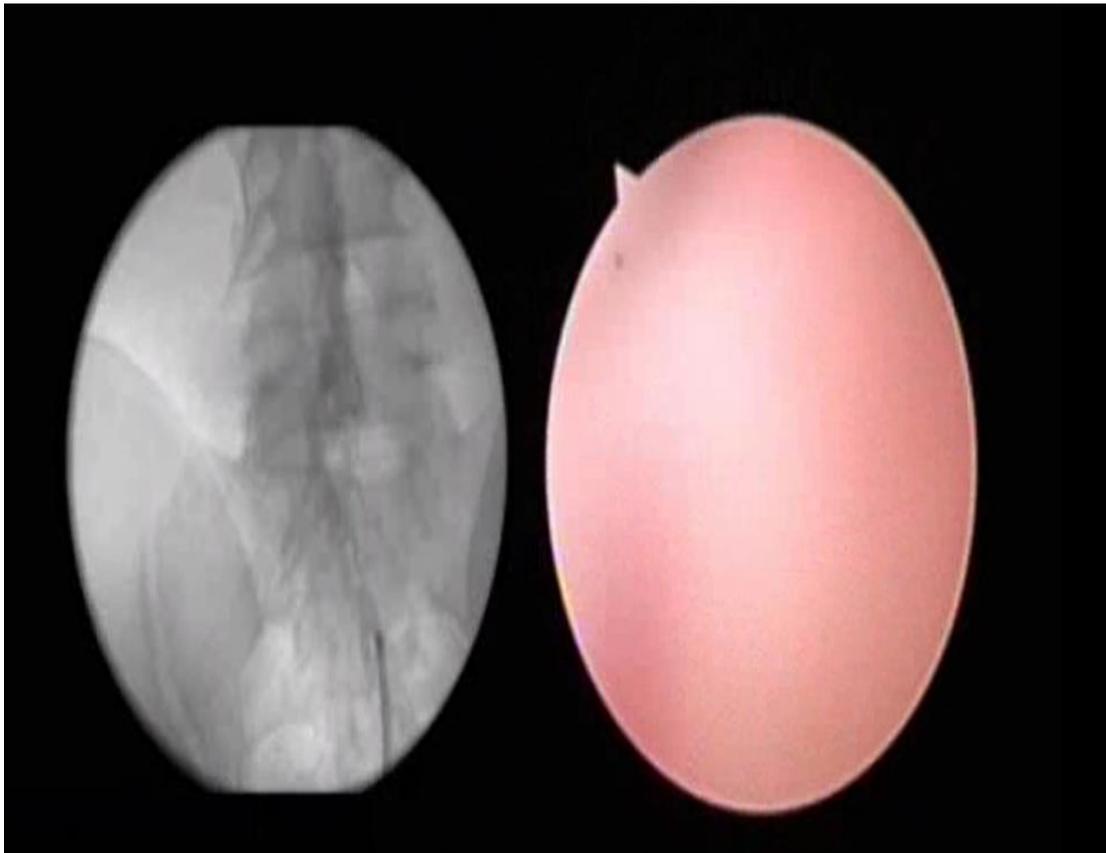
sciatica pain (short term less than 6 Months, long term more than 6 Months), Functional outcome, Return back to work, psychological status, Change in narcotic intake, with the general satisfaction rate.



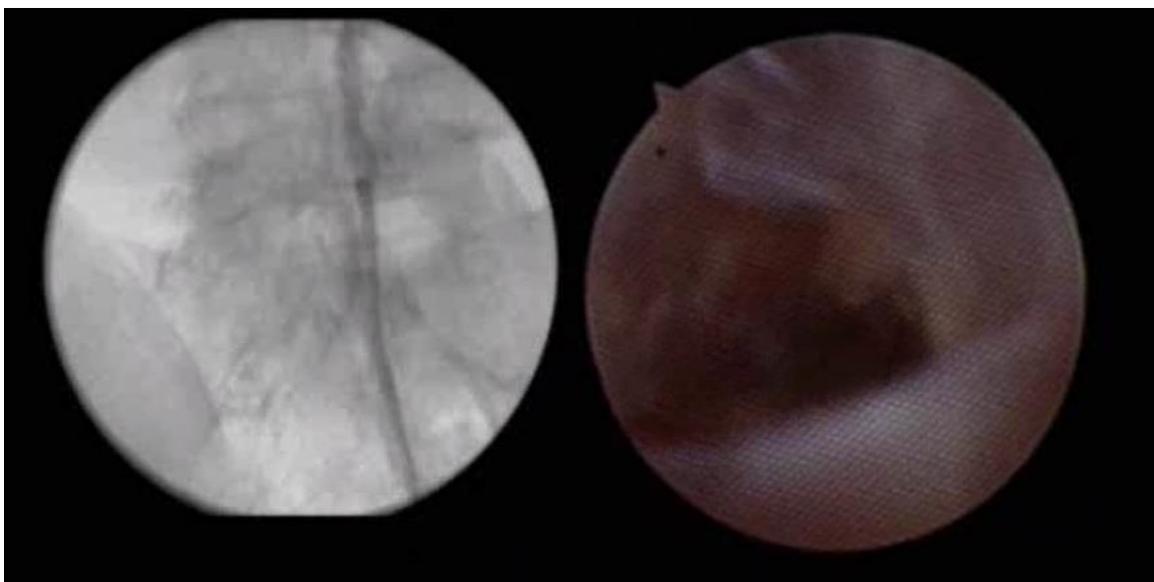
**Fig. 3 Epidurogram / Block by Fibrosis& Adhesion**



**Fig. 4 Epiduroscope; Through Sacral Canal**



**Fig. 5 Epiduroscope check the obstruction level**



**Fig. 6 Epiduroscope/ Epidurogram Canal Opening**

**Stanford score**

- Back Pain: 0 - 10
- Medication Use: 0 - 10
- Life Restrictions: 0 - 10
- Satisfaction of condition: 0 - 10

**Stanford Score:**

- \* Functional outcome
- \* Return back to work
- \* Psychological Status

**ODI (Oswestry low back disability):**

- 0% to 20%: minimal disability
- 21%-40%: moderate disability

41%-60%: severe disability  
 61%-80%: crippled  
 81%-100%: Absolute bed ridden  
 Also there were significant statistical differences at 12, 24 Months follow up for both Stanford and ODI Oswestry index

between group A and group B revealed high outcome results for group B was treated by epiduroscopic adhesiolysis technique (P-value <0.0001) with minimal complications rate in group B compared to group A.

Table 1. Group A treated by surgical procedure

Group A there was significant difference among the means of both scores (Stanford and ODI Oswestry ) of the different period of follow up (P value <0.0001)							
Group A Standford	Mean	F	p- value	Group A ODI Oswestry	Mean	F	P – value
Baseline	2.4			Baseline	54%		
1 Month	4.7			1 month	41%		
3 month	5.6	4.86	0.0001	3 month	36%	28.32	0.0001
6 month	6.4			6 month	44%		
12 month	6.8			12month	39%		
24 month	6.7			24 month	37%		

Table 2. Group B Treated by Epiduroscopic procedure

Group B there was significant difference among the means of both scores (Stanford and ODI Oswestry ) of the different period of follow up (P value <0.0001)							
Group B Standford	Mean	F	p- value	Group B ODI Oswestry	Mean	F	P – value
Baseline	2.9			Baseline	55%		
1 Month	6.5			1 month	12%		
3 month	6.9	7.1	0.0001	3 month	14%	13.6	0.0001
6 month	7.8			6 month	11%		
12 month	8.6			12month	10%		
24 month	9.4			24 month	9.0%		

**Complications:** No major complications with patients treated by Epiduroscopic Adhesiolysis , Such as nerve damage, epidural damage, or infection, were encountered either during or after adhesiolysis Recurrence of Symptoms (Re adhesion).

## Discussion

The incidence of FBSS after spinal or vertebral surgery is estimated to range from 5% to 50%. In the USA, with increase the number of FBSS every year, and the causes of FBSS development include scar formation and adhesion in the epidural space <sup>6, 8, 14, 17</sup>. Compare to

incidence in our study from 20% to 55% of adhesion.

According to Manchikanti and colleagues, of patients show improvement of their symptoms of chronic back and Radicular pain for 3 months after epiduroscopic adhesiolysis, Were improvement with high satisfaction rate of return functional outcome in our study with 56% of patients improvement at 6 months, and 48% of patients retain symptom improvement at 1 year <sup>6,15,16,18</sup>.

According to Manchikanti and colleagues<sup>14, 18</sup>, 80% of patients show improvement of their symptoms of chronic back and Radicular pain for 3 months after epiduroscopic adhesiolysis, compare to our

study reach 86% improvement at 12 months and 89% after 24 months.

Epidural imaging with a contrast medium was reported to be useful for identifying the anatomical structure in the epidural space<sup>9, 10,17</sup> confirmed by our study block in lumbar spinal level which is seen in the epidurogram were opening by Epiduroscope technique visualized in the canal . A number of methods have been used in previous studies to evaluate the therapeutic effects of adhesiolysis. These include: visual analogue scales (VAS), the ODI score, range of daily activity, psychological status, amount of oral medications, and return to the workplace after adhesiolysis<sup>14,15, 18</sup>.

**OUTCOME:** Improvement in contrast filling defects of the epidural space was noticed during treatment by epiduroscopic adhesiolysis combined to improvement in pain, short term & long term compared to second time lumbar spinal surgery.

**Evaluation of the therapeutic results of epiduroscopic adhesiolysis for failed back surgery syndrome;** Epidurography is both a diagnostic and treatment tool. It is used to assess the structure of the epidural space in the spine by injecting contrast dye under fluoroscopic guidance. In This procedure we confirmed the adhesion & fibrosis which were seen by MRI .usually done before epidural materials-drugs are administered to ensure accurate delivery of therapeutic material to the source of the pain. Important advantages of epiduroscopic diagnostic & therapeutic are superior to second time surgical release.

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