



## SPECTRUM OF POST LAMINECTOMY SYNDROME AND ITS MANAGEMENT

## Neurosurgery

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## ABSTRACT

**Introduction:** Post laminectomy syndrome is becoming an increasingly common challenge for clinicians who deal with spinal disorders owing to the expanding indications for spinal surgery and the aging world population. A multidisciplinary approach is most appropriate for patients who are unlikely to benefit from further formal surgical intervention. Surgical intervention is the last resort for post laminectomy syndrome. However patients with visible cause for low back pain can benefit from surgery.

**Material And Method:** It is a prospective study that was conducted in our institute for 2 years. Patients coming to our institute with lowback pain (LBP) or LBP along with radiculopathy who underwent lumbar spine surgery for the same cause were included. All patients were evaluated with Gadolinium enhanced MRI to look for epidural fibrosis, fibrosis around nerve roots, extruded disc, infections.

**Results:** Total of 48 patients were included in the study. 29 patients were managed conservatively and 19 patients were operated. 89.5% of the operated patients had a favourable outcome post operatively and 82% had a favourable outcome in the conservative group. 5 patients had post-operative complication in the form CSF leak and infection.

**Conclusion:** Post laminectomy syndrome management has been always a multimodality treatment. Patients with epidural and nerve root fibrosis are always poor candidates and surgery should be avoided in such cases. Psychiatric counselling and physiotherapy are also invaluable in conservatively managed groups.

## KEYWORDS

Post laminectomy. Recurrent lumbar disc herniation. Epidural fibrosis.

## INTRODUCTION

Low back pain (LBP) is a very common problem all over the world and has a lifetime prevalence of 60-80%<sup>1</sup>. As a results most patients seeks treatment which consequently leads to surgical interventions in most cases. Post laminectomy syndrome (PLS) is also known as Failed back syndrome which is actually a misnomer<sup>2</sup>. A simplified definition is "when the outcome of lumbar spine surgery doesn't meet the expectations of the patients and the surgeons"<sup>3</sup>.

## Factors Leading To PLS:

- Patient factors:** patients with pre-existing depression and poor psychosocial wellbeing are very prone<sup>4</sup>. Smoking and obesity have also been a known risk factor.
- Operative procedure:** wrong level surgery<sup>7</sup>, intra operative errors, decompressive surgery in presence of an axial or mechanical pain, may not only cause on-going pain but also trigger new pain source. Similarly errors placements of lumbar pedicle screws and implant breakage has potential for serious neurological complications.<sup>8</sup>
- Postoperative factors:** in the early period infection, nerve injury during OT & pseudomeningocele are the cause. Lately altered biomechanics due to surgery (eg. transition syndrome) cause change in the load causing acceleration in the degenerative process and subsequently PLS.

## METHOD

It is a prospective study that was conducted in our institute from December 2019 to December 2021.

Patients coming to our institute with lowback pain (LBP) or LBP along with radiculopathy who underwent lumbar spine surgery for the same cause were included. We also included patients that were operated in different institutes but were followed up by us.

Patients with pre-existing spinal diseases (spinal tumors, previously operated for other spinal pathology, significant trauma after spine surgery) were excluded.

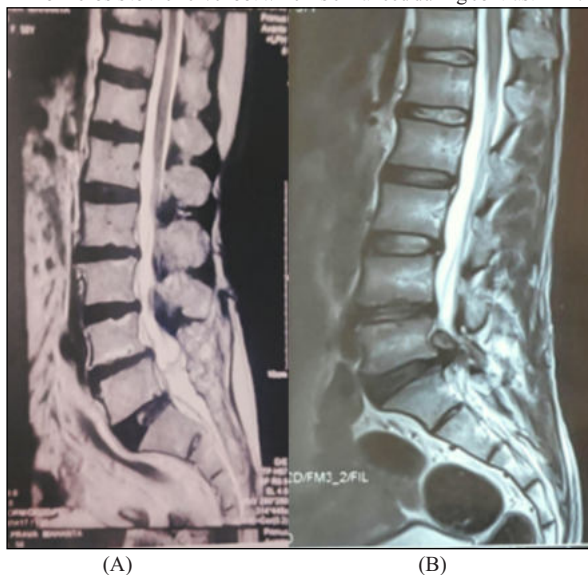
A thorough history was taken from all patients; patients were than examined clinically to check for Straight Leg Raising test (SLRT), jerks, muscle power, sensory disturbances if any, and bowel and bladder involvement.

All patients were evaluated with Gadolinium enhanced MRI to look for epidural fibrosis, fibrosis around nerve roots, extruded disc, infections. Dynamic x-ray was done to rule out spinal instability. Laboratory investigation in the form of Routine blood, ESR, CRP (C-reactive protein), serum vitamin D levels was evaluated.

## RESULTS

During the study period of two years we included 48 patients in our study.

- Age group:** our youngest patient is 22 years and the oldest is 68 years. Average age of the patient  $45 \pm 23$  years.
- Gender ratio:** Male : female ratio is 3:1
- Average durations of symptoms :**  $10 \pm 6$  months
- MRI findings:** Of the 48 patients 20 patients had extensive epidural fibrosis (Figure 1), 12 had recurrent lumbar disc herniation, 8 had inadequate pervious surgery, anterior listhesis in the form of spinal instability was found in 4 cases and 2 cases had post-operative discitis and 1 patient each of implant failure and wrong level surgery. (Figure 2) Patients with epidural fibrosis has also shown extension of fibrosis to the nerve root which is enhanced during contrast MRI.



**Figure 1:** (A) MRI showing extensive epidural fibrosis and secondary canal stenosis. (B) MRI showing recurrent disc herniation and associated fibrosis

## E) Clinical Presentations:

Almost all of the 48 patients had low back pain with different degree of severity. 37 patients presented with unilateral or bilateral radicular pain. Diminished jerk (ankle/medial hamstrings jerk) were found in 23

patients and 36 patients had sensory deficit. 30 patients had diminished power (decreased power in EHL, foot inversion and eversion). 5 patients presented with features of Cauda equine syndrome and bowel and bladder involvement (Table 1).

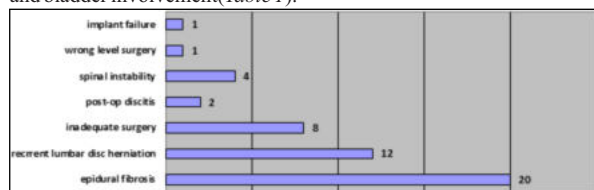


Figure 2: MRI findings

#### f) Treatment:

Of the 48 patients a total of 19 patients were operated. Of them 10 cases were of recurrent lumbar disectomy, 3 cases belong to inadequate surgery group, 4 cases were of spinal instability for which fixation was done (TLIF) and one cases each of implant failure and wrong level surgery. In the recurrent lumbar disc herniation group on disectomy was done, of them 5 had Cauda equine syndrome. We faced problem with epidural fibrosis (figure 3) which increased our duration of surgery and complication. Post-operative CSF leak was found in 5 patients (26.3%) and one had wound site infection. Average stay in hospital was 8.9 days. Rest 29 patients were managed conservatively with painkillers (NSAIDs & opioids), Gabapentinoids, Antidepressants and Physiotherapy. 10 patients have received epidural steroids and are doing well on follow up. (Table 2)

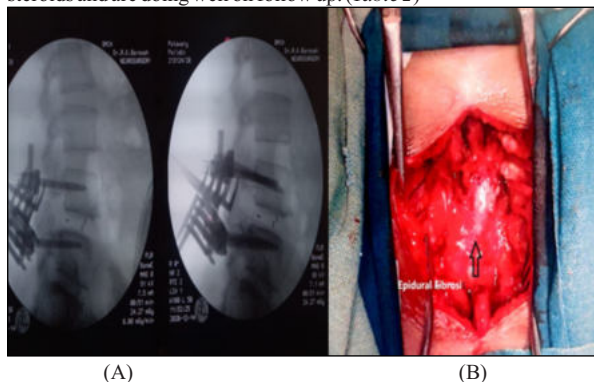


Figure 3: A) Showing TLIF done for L4-L5 anterior listhesis (B) Showing extensive epidural fibrosis encountered during second for recurrent lumbar disc herniation

Table 1

| Clinical feature                       | Number patients | Percentage |
|----------------------------------------|-----------------|------------|
| LBP                                    | 40              | 100%       |
| Radicular Pain                         | 37              | 77.08%     |
| Diminished reflexes                    | 23              | 47.91%     |
| Sensory disturbances                   | 36              | 75%        |
| Diminished power of lower limb muscles | 30              | 62.5%      |
| Bowel and bladder involvement          | 5               | 10.41%     |

Table 2

| Treatment    | Number of patients | Complications                           | Outcome                                   |
|--------------|--------------------|-----------------------------------------|-------------------------------------------|
| Surgery      | 19                 | 5 had CSF leak & 1 wound site infection | Excellent -12<br>Good -5<br>No change - 2 |
| Conservative | 29                 | none                                    | Excellent -10<br>Good -14<br>No change -5 |

#### DISCUSSION

The management of post laminectomy syndrome should be based on the pathology. Surgical option should only be when there is visible pathology or when there is progressive deterioration of neurological status.

Success rate of reoperation in PLS is variable which ranges from 25% to 81%.<sup>9</sup> Patients with epidural fibrosis are less likely to have satisfactory results, in some series the success rate is 66%.<sup>10</sup> Benefit of surgery is seen only in patients with recurrent disc herniation, spinal

instability and spinal canal stenosis. In our study nearly 89.5% of the operated patients had a favourable outcome post operatively. We have managed all the cases of epidural fibrosis conservatively with multimodality treatment in the form of epidural steroids to psychiatric counselling from NSAIDs to physiotherapy, 82% had a favourable outcome. Patients with recurrent disc herniation evident on MRI invariably needs a surgery, 10 out of the 12 cases were operated in our study. Recurrent lumbar disc herniated patients are more likely to present with red flag signs (bowel & bladder) involvement which needs prompt management.

#### CONCLUSION

Post laminectomy syndrome management has been always a multimodality treatment. Surgical interventions are kept as last resort, however from our study we can say that there is still hope for patients with identifiable cause ranging from recurrent herniated disc, listhesis or canal stenosis. Patients with epidural and nerve root fibrosis are always poor candidates and surgery should be avoided in such cases. Psychiatric counselling and physiotherapy are also invaluable in conservatively managed groups.

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