

# Lumbar Interlaminar Epidural Injections in Managing Chronic Low Back Pain With Sciatica Without Using Fluoroscopy

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## ABSTRACT

**Objective** To find out the effectiveness of interlaminar parasagittal lumbar epidural injection without using fluoroscopy in the management of low back pain with radiculopathy.

**Study design** Descriptive case series.

**Place & Duration of study** Ziauddin University Hospital Karachi Clifton campus, from January 2013 to December 2014.

**Methodology** Patients with lumbar back pain associated with unilateral sciatica for more than three months duration were included. Visual analogue scale (VAS) of 100 was used for pain severity assessment. Lumbosacral spine x-rays with skin surface marking were obtained before the procedure. Interlaminar parasagittal approach was used in lateral position with affected leg up. Follow up was done at 6 weeks, 3 months, and 6 months. During the course of 6 months, three injections were offered at any point of recurrence of pain with at least 2 to 3 weeks interval.

**Results** A total of 75 patients of both genders with the mean age of 45.03 + 14.35 year were included. Disc levels involved were L4/5 (53.33%), L5/S1 (38.66%), and L3/4 (8%). Pre-procedural mean VAS score was 75.2 + 15.99. In 65.33% patients sustained significant relief in pain noted at six months follow up. In 20% patients short term recovery observed with recurrence of pain in three months. No major complication was encountered during the procedure.

**Conclusion** Interlaminar parasagittal epidural injection is simple, effective in relieving chronic low back pain associated with sciatica and does not need any special medical equipments and setup.

**Key words** Interlaminar parasagittal epidural injection, Low back pain, Sciatica, Epidural steroid injection.

## INTRODUCTION:

Low back ache with or without radicular pain is the commonest spine related complaint. Among multiple treatment modalities for this condition epidural injection is the most commonly used.<sup>1,2</sup>

The pathophysiology of radicular pain include

compression as well as an inflammatory process.<sup>3</sup> The use of local anesthetic and steroid in this procedure is therefore recommended. The common practice is to inject a combination of steroid (methylprednisolone) and local anesthetic (bupivacain) in the epidural space.

Intervertebral disc commonly herniates posterolaterally at the point where nerve root exit. This is the ventral part of the epidural space and the target site for the drug delivery. The pain relief is thought to be very significant if drug is delivered close to this site.<sup>1,4</sup> To deliver maximum volume of medication at this target site, several approaches have been devised. Commonly used approaches are interlaminar (IL), midline or parasagittal, transforaminal (TF) and caudal epidural. Interlaminar approach

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whether midline or parasagittal is not target specific, hence its efficacy has been challenged, while transforaminal approach is considered to be more target specific with superior results as compared to the interlaminar approach.<sup>5</sup>

The cost of epidural injection in a designated operation theatre with the use of fluoroscopy is comparatively more than without it. In this study interlaminar parasagittal approach without using fluoroscope in recovery room was used to find out how effective pain relief achieved with this approach.

#### METHODOLOGY:

This case series was conducted at Ziauddin University Hospital Clifton Campus Karachi, from January 2013 to December 2014. After written and informed consent, patients were recruited for the study. All patients with lumbar back pain associated with unilateral severe refractory sciatica for more than three months duration, not responding to all types of analgesics and physiotherapy, were included. Patients with previous history of lumbar spine surgery, spinal stenosis, psychological instability, complete or partial power loss, pregnant, lactating women and patients with bleeding disorders or on anticoagulants, were excluded.

For diagnosis magnetic resonance imaging (MRI) was used to locate the exact level of disc herniation and its relation with clinical findings. Visual analogue scale of 100 was used for pre and post-procedure pain severity assessment. In this scale 0 means no pain and 100 is the worst possible pain. Pain relief of more than 50% was taken as significant outcome. Before procedure patients were taken to radiology department for skin surface marking in same lateral position in which the procedure had to be performed. Metallic skin markers were removed and interspinous spaces were marked with permanent ink marker after confirmation of level on x-rays.

Injection procedures were performed by the anesthetists. In a recovery room patients were placed

in lateral position with affected leg up. After aseptic measures the proposed skin site was instilled with local anesthetic followed by interspinous space insertion of a 22 gauge spinal needle at affected level of disc. Needle was advanced antero-laterally, so that maximum parasagittal trajectory could be achieved. Loss of resistance to saline technique was used and after negative aspiration of cerebrospinal fluid and blood, a combination of 2 ml of methylprednisolone and 2 ml bupivacain were injected. After the procedure, all patients were asked to lie in a prone position for at least 30 minutes. After the procedure, patients were observed for one hour for any new pain, headache, vomiting etc and then discharged.

Immediate pain relief was an indication of targeted drug delivery but not considered as pain relief. All patients were followed up fortnightly for first 6 weeks, then at 3 months and 6 months. Effective pain relief of more than 50%, maintained for at least 3 months was considered successful while remaining as failed procedures. Same pre-procedural analgesics were allowed to be used with gradual tapering. During the course of 6 months, three injections were offered at any point of recurrence of pain with at least 2 to 3 weeks interval. Descriptive statistics were used to present data.

#### RESULTS:

A total of 75 patients of both genders were enrolled. Duration of pain ranged from 3 months to 3 years. Age ranged from 20 year to 75 year with mean age of 45.03+14.35 year. Disc levels involved were L4/5 in 40 (53.33%), L5/S1 in 29 (38.66%), and L3/4 in 6 (8%) patients. Forty-eight (64%) patients had left and 27 (36%) right sciatica. Magnetic resonance imaging revealed disc bulging with intact annulus fibrosis in 55 (73.33%) patients and disc herniation with sequestered fragments in 20 (26.66%) patients.

Pre-procedural mean VAS score was 75.2 +15.99 (ranged from 50 to 100%). In 11 (14.66%) patients no significant pain relief occurred within 06 weeks

**Table I: Pain Relief On VAS Score**

Group/Patients	Pre-procedural Mean VAS score	Follow up	Post-procedural Mean VAS score	Relief
I (n=11)	75.2 +15.99	06 weeks	70.45+16.34	6.7%
II (n=15)	75.2 +15.99	06 weeks 03 months	25.75+6.30 55.07+11.37	65% 26.42%
III (n=49)	75.2 +15.99	06 weeks 03 months 06 months	12.85+3.67 15.46+4.73 10.68+7.11	80.71% 79.28% 83.83%

even after 3 epidural injection with 2 weeks interval. Their post-procedural VAS score was 70.45+16.34 (6.7% relief) which was not a significant relief as compared to pre-procedural VAS score of 75.2 +15.99 (table I). There were two cases of dural puncture. One patient did not complain of any spinal headache but second patient had persistent headache for more than 10 days which ultimately resolved with symptomatic treatment.

#### DISCUSSION:

It is evident from an extensive review of literature that low back pain is of multifactorial origin and no single etiology is operative. It includes mechanical and inflammatory etiologies, like Intervertebral disc degeneration, disc herniation and facet arthropathies.<sup>4,6</sup> Similarly radicular pain is not only due to the physical presence of herniated intervertebral disc but other mechanisms might be involved. Because of the diverse mechanism involved in both low back pain and sciatic pain, epidural injection is sometimes absolutely not effective in a group of patients even with the use of corticosteroids.<sup>7</sup> In our study, 14.66% patients did not show any relief even with three consecutive injections with two to three weeks interval. Failed epidural injections may be either due to inadequate drug delivery at the affected nerve root level or due to multifactorial etiology of both low back pain and sciatica.<sup>3,8</sup>

Different approaches are in practice to deliver the maximum volume of epidural drug at the affected root site. The ideal approach has still not been confirmed. Transforaminal approach has been considered to be the superior approach as compared to interlaminar and caudal epidural approaches.<sup>4</sup> Transforaminal approach has been criticized due to its associated technical difficulties and risks.<sup>9,10</sup>

In our study, immediate pain relief at the time of injection was an indirect evidence of correct position and significant volume of drug delivered at the affected root site. Beside anatomical landmarks, skin surface markers helped in more accurate epidural drug delivery. The successful infiltration of epidural drug has been documented in 92% patients with readily palpable anatomical landmarks without using flouroscepe.<sup>11</sup>

The results of this study showed the effectiveness of lumbar epidural injection therapy for a period of six months in most (65.33%) of the patients. In some studies only moderate pain relief was obtained for 3 weeks to 3 months.<sup>12</sup> Our study supports both short and long term pain relief with epidural injection as reported by others.<sup>11</sup> In a double blind controlled

trial, significant pain relief (more than 50%) was observed even at one year follow up in 74% to 86% patients with approximately four injections per year.<sup>13</sup> This study encourages further injections and follow-up to achieve long term results. The optimal number of injections has not been defined clearly.<sup>14</sup> In our study, 85% patients received more than two injections.

Epidural injection is a good supportive treatment for sciatica but there is a strong need for developing a uniform protocol and standards of practice for this treatment modality. Safe number of injections with or without fluoroscopy, ideal route (transforaminal or interlaminar) are some tasks need to be addressed.

#### CONCLUSIONS:

Epidural injection is effective for short term pain relief. The parasagittal interlaminar approach may be considered as good alternative to the transforaminal approach due to its relatively better safety profile, less technical demand with no need of any special medical equipments or setup.

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**Author's Contributions:**

Tariq Muhammad: Designed the study protocol, selected and recruited the patients, collected, analyzed the data and wrote the manuscript.

Mukesh Kumar: Performed anesthesia procedure.

Imtiaz Ahmad Hashmi: Designing of the study protocol, patient selection / data collection and critical review of the manuscript content.

M. Younus Khatri: Final review of the manuscript.

**Conflict of Interest:**

The authors declare that they have no conflict of interest.

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