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**Dr. Syed Sheikh Mohd Faizan**
Affiliated to Govt. Hospital for Bone and Joints Surgery, GMC, Srinagar, Jammu and Kashmir, India

**Dr. Shahan Malik**
Affiliated to Govt. Hospital for Bone and Joints Surgery, GMC, Srinagar, Jammu and Kashmir, India

**Dr. Aiman Ahmad Wani**
Affiliated to Govt. Hospital for Bone and Joints Surgery, GMC, Srinagar, Jammu and Kashmir, India

**Dr. Iftikhar H Wani**
Affiliated to Govt. Hospital for Bone and Joints Surgery, GMC, Srinagar, Jammu and Kashmir, India

**Corresponding Author:**
**Dr. Aiman Ahmad Wani**
Affiliated to Govt. Hospital for Bone and Joints Surgery, GMC, Srinagar, Jammu and Kashmir, India

# Efficacy of caudal epidural steroid injection in the Management of low backache with radiculopathy

**Dr. Syed Sheikh Mohd Faizan, Dr. Shahan Malik, Dr. Aiman Ahmad Wani and Dr. Iftikhar H Wani**

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**Abstract**
**Background:** The most prevalent condition in society that leads to morbidity and socioeconomic loss is low back pain (LBP). Even though LBP resolves on its own, when it persists and is accompanied by radicular pain it causes functional limitations. NSAIDs, analgesics, oral or parenteral steroids, therapeutic exercises, and epidural injections are nonsurgical treatments for lumbar radicular pain. Lumbar and caudal methods are used to administer epidural injections. Despite the fact that there are many different therapy choices, many of them have dubious or inadequately studied results, hence we planned this study.
**Objective:** To assess the benefits of caudal epidural steroid injection by examining the clinical and functional results in cases of low backache and lumbar radiculopathy.
**Materials and methods:** A prospective follow-up study was carried out in the Department of Orthopaedics at Government Medical College Srinagar from May 2021 to April 2023 with the purpose of determining the effectiveness of caudal epidural steroid injection in cases of prolapsed intervertebral disc (PIVD). We used caudal epidural steroids in sterile operating rooms to treat 50 patients of LBP that matched the inclusion criteria and did not improve with non-invasive and non-surgical techniques. Our 10 ml injectable cocktail consisted of 1 ml (2%) Xylocaine + 80 mg Methylprednisolone + 8 ml Normal saline.
**Results:** Fifty patients completed the study. After a week, 41 patients (82%) out of 50 do not report having a low backache or discomfort spreading to one or both lower limbs. However, nine individuals (18%) have a second epidural steroid injection after a month and experience either partial improvement or persistent problems after three days. Two patients from group I, three from group II, and four from group III are among the patients who required a second injection. Forty-six patients (92%) report no discomfort after one month, although four patients (8%) report some back pain that healed after two to three months of consistent physiotherapy and posture correction activities.
**Conclusion:** Caudal ESI is a day care technique that is simple to administer. In skilled hands and with carefully chosen cases, caudal ESI is a reasonably safe treatment when carried out under sufficient aseptic circumstances. When other traditional non-surgical therapy options for people with chronic LBP are not working, ESI might be utilized as an alternative.

**Keywords:** Epidural steroid injection, low back pain, conservative treatment, lumber disc herniation

## Introduction
The high lifetime prevalence of LBP (80%) in the population and its impact on an individual's pain and disability are the reasons for its significance [1]. The most prevalent condition in society that leads to morbidity and socioeconomic loss is low back pain (LBP). Even though LBP resolves on its own, when it persists and is accompanied by radicular pain, it causes functional limitations. One of the most frequent justifications for using medical services is this [2]. Thirteen percent of people have chronic, high-intensity back pain, which can cause moderate to severe impairment [1, 3]. A number of research carried out in the past ten years have demonstrated a clear trend toward nonsurgical therapy of radicular symptoms associated with lumbosacral disc herniation. NSAIDs, analgesics, oral or parenteral steroids, therapeutic exercises, and epidural injections are nonsurgical treatments for lumbar radicular pain [2]. Lumbar and caudal methods are used to administer epidural injections. Despite the fact that there are many different therapy choices, many of them have dubious or inadequately studied results [3].

Hollander *et al*.'s 1951 publication was the first to describe the injection of steroids into arthritic joints. In [4] In the 1950s and 1960s, lumbar radiculopathy was initially treated with steroids [5]. Inflammatory cytokines' impact on the dorsal root ganglion and mechanical deformation have both been linked to radicular pain. This makes the local distribution of steroids via epidural injection appear like a sensible choice [6, 7]. The efficacy of epidural corticosteroids has been shown to range from 18% to 90% [1]. Therefore, epidural steroid injections are the most controversial and misunderstood therapy approach in addition to being the most widely used intervention. Following its successful use in the treatment of sciatica, epidural steroid injection was expanded to include facet joint blocks and other forms of neural blockade [8, 9].

This study was conducted in the Department of Orthopaedics, Government Medical College, Srinagar, to assess the functional results in patients treated with caudal epidural steroid injections for chronic low back pain lasting longer than three months.

**Materials and Methods**

A prospective follow-up study was carried out in the Department of Orthopaedics at Government Medical College Srinagar from May 2021 to April 2023 with the purpose of determining the effectiveness of CESI in cases of prolapsed intervertebral disc (PIVD). We used caudal epidural steroids in sterile operating rooms to treat 50 patients of LBP that matched the inclusion criteria and did not improve with non-invasive and non-surgical techniques.

**Inclusion criteria:** Ages above eighteen for both sexes, a history of lower back pain and lower extremities discomfort lasting at least six weeks and not improving with conservative treatment, and an MRI confirming the diagnosis of PIVD are the inclusion criteria.

**Exclusion Criteria:** The following criteria are used to exclude patients from the study: not wanting to take part, PIVD with neurological deficits, prior lumbar surgery, spinal stenosis, anomalies in the structure of the spine, any acute or chronic uncontrolled medical disease, and psychological disorders that could affect the patient's ability to be assessed. Individuals who have a history of potential steroid side effects were also excluded from the research.

Written informed consent taken from patient for procedure and publication. The entire process is carried out using aseptic care. Our 10 ml injectable cocktail consisted of 1 ml (2%) Xylocaine + 80 mg Methylprednisolone + 8 ml regular saline.

Usually, the patient is awake during this process. The epidural injection process is often painless because the lower back treatment area is first made numb with a local anaesthetic injection.

The patient in our study was requested to lie down prone, with their lower back and upper thigh well exposed, revealing the gluteal region. A 4-inch cushion slid out from under the crotch. Sacral cornuae and the apex of the sacral hiatus are marked with a sterile marker pen after cleaning, painting, and drapery are completed with all aseptic procedures.

A size 18/20 gouge with a syringe containing 10ml cocktail is introduced at a 45-degree angle, just distal to the sacral hiatus. When the needle touches the bone, the angle is changed to 30 degrees, and it is then introduced for an additional centimetre. Next, aspiration is performed to see if any blood is present in the solution, and then the cocktail is slowly injected into the canal. If it passes through without any resistance, it indicates that the canal is entered. During the injection, the patient is asked if he feels the solution has touched his lower limb and back. If so, he is given the option to continue or switch to another cocktail (10 ml). The patient is instructed to lie flat for the next two hours after remaining in the same posture for the previous fifteen minutes. Patient is instructed to have medicine and physical therapy the following day.

**Fig 1:** Draping of site

**Fig 2:** Materials Used During Procedure

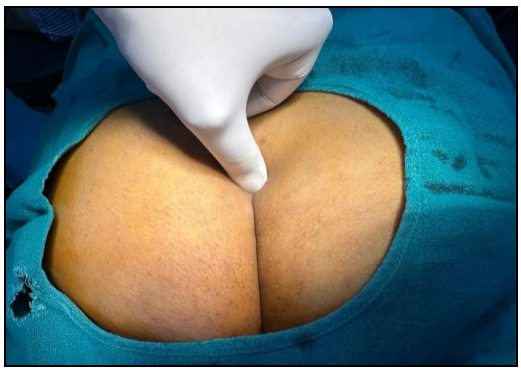

**Fig 3:** Identifying injection site

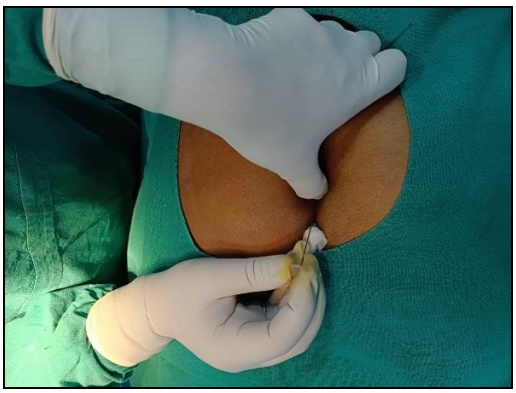

**Fig 4:** Angle for injection and insertion of needle

**Fig 5:** Administration of Injection and procedure photo

## Results

**Table 1:** Distribution according to age

| | Age in years | Number of patients | Percentage |
|---|---|---|---|
| Group I | <40 | 12 | 24% |
| Group II | 41-60 | 28 | 56% |
| Group III | >60 | 10 | 20% |
| Total | <40 | 5 | 100% |

Out of 50 patients selected for study, we made 3 groups according to age.
Gender distribution

**Table 2:** Distribution according to gender

| Sex | Number of Patients | Percentage |
|---|---|---|
| Male | 34 | 67% |
| Female | 16 | 32% |
| Total | 35 | 100% |

Mean for age is 52.4.

The patient asked a to follow-up visit in the outpatient department (OPD) on one week, first, third, and six months to check for sciatic point discomfort radiculopathy, low back pain, and the straight leg raise test. After a week, 41 patients (82%) out of 50 do not report having a low backache or discomfort spreading to one or both lower limbs. However, nine individuals (18%) have a second epidural steroid injection after a month and experience either partial improvement or persistent problems after three days. Two patients from group I, three from group II, and four from group III are among the patients who required a second injection. Forty-six patients (92%) report no discomfort after one month, although four patients (8%) report some back pain that healed after two to three months of consistent physiotherapy and posture correction activities.

## Discussion

Herniated nucleus pulposus pain is a significant medical and socioeconomic issue. Pain and limited movement are major detriments to one's quality of life, especially for those who work. Analgesic use for extended periods of time is not recommended nor advantageous. For LBP, lumbar tractions, different physiotherapy methods, and manipulations have all been employed, but with varying degrees of success. Surgery should only be considered in cases that are unrelenting or in which neurological condition is rapidly declining. Many LBP patients attend different orthopaedic departments feeling dissatisfied or unrelieved due to the limited array of treatment available.

The transforaminal, interlaminar, and caudal routes are the methods for administering steroids; in this case, the caudal route is being used. The caudal epidural block was initially presented as a blind, landmark-based procedure. The blind approach has a success record of over 96% in youngsters [10, 11]. Even in the hands of skilled practitioners, it was only 68–75% in adults [12, 13, 14].

One can provide epidural steroid injections by caudal, interlaminar, or transforaminal methods. The use of ESI by transforaminal route was documented by Robechhi and Capra (1952) [15] and Lievre (1953) [16], whilst the administration of corticosteroids by caudal epidural space was recorded by Cappio [17] in 1957. We employed the caudal epidural method and obtained good outcomes.

Peng *et al*. (2007) [18] found that the primary pathophysiological mechanism for leg pain in patients with discogenic low back pain but without a disc herniation may be the leakage of chemical mediators or inflammatory cytokines produced in a painful disc into the epidural space through an annular tear. This could cause damage to neighbouring nerve roots.

Although Wilson-MacDonald *et al*.'s study [19] did not find any long-term effects, it did show a considerable early reduction in pain. Buchner *et al*. [20] reported similar outcomes, with the most significant pain alleviation occurring in the first two weeks and no discernible improvement at the six-week and six-month mark.

Our findings supported earlier research suggesting that the benefits of CESI are temporary in terms of the patient's improved pain and functional status. However, because to the brief trial time, we were unable to comment on the long-term effects. We also noted that there was good tolerance to CESI. Our investigation revealed a few minor side effects, including a brief headache and a slight escalation of radicular discomfort following injection, but no serious side effects were noted.

It is advised to conduct more research on a bigger patient population over an extended length of time in order to determine whether patients require additional injections and whether doing so will prevent the need for surgery during this time or necessitate surgical intervention.

## Conclusion

When other traditional non-surgical therapy options for people with chronic LBP are not working, ESI might be utilized as an alternative. They might lessen the requirement for additional procedures. Caudal ESI is a day care technique that is simple to administer. In skilled hands and with carefully chosen cases, caudal ESI is a reasonably safe treatment when carried out under sufficient aseptic circumstances.

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## Conflict of Interest

None.

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