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Case Series

Clinical Outcome of Therapeutic Selective Nerve Root Block and Facet Joint Infiltration with Methylprednisolone with Lidocaine Given in Patients with Lumbosacral Radiculopathy - A Case Series

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Abstract:

Background: Selective nerve root block (SNRB) and Facet joint infiltration (FJI) are procedures that can be used as therapeutic modality for lumbosacral radiculopathy. Our study aims to investigate the clinical effectiveness of the use of fluoroscopically guided therapeutic selective nerve root block as a non-surgical symptom management of lumbosacral radiculopathy.

Patients and Methods: This is an observational study of therapeutic nerve root block and Facet joint infiltration administered in 50 patients with low back pain and/or sciatica at tertiary care hospital. Data was collected by independent clinical interviewers, and The Modified Oswestry Low Back Pain Disability Questionnaire was used to measure pain severity and for post procedure relief of symptoms.

Results: A total of 50 patients, 28 (56%) males and 22 (44%) females, underwent SNRB and FJI. 60% patients had good outcome whereas 34% patients had fair outcome. 64% patients had reduction in symptoms post-operatively. The difference between the outcome and post-operative symptoms was statistically significant (X^2 =4.24, p =0.38)

Conclusion: Therapeutic SNRB with FJI is an important procedure in the pain management of patients with lumbar radiculopathy caused by lumbar disc prolapse and foraminal stenosis. Our study showed that 17 out of 28 males had good outcome whereas 13 out of 22 females had good outcome. 60% patients had good outcome whereas 34% patients had fair outcome. pain relief for at least 6 months was achieved in up to 64% of patients after a single SNRB with FJI. This makes it a very good second line of management after conservative treatment and a possible method to delay, and sometimes cease, the need for surgery.

Introduction

Lumbosacral radiculopathy is described as a pain syndrome caused by compression or irritation of nerve roots in the lower back. It can be caused by lumbar disc herniation, degenerative changes of spine, scoliosis and narrowing of the foramen from which the nerves exit the spinal canal. Similarly, the facet joints, which are paired synovial joints that play important roles in load transmission and stability during spinal movements, can also be the cause of nerve root compromise [2]. Symptoms include low back pain that radiates into the lower extremities in a dermatomal pattern. Other symptoms can include numbness, weakness, and loss of reflexes, although the absence of these symptoms does not exclude a diagnosis of lumbosacral radiculopathy.[3] On average, 3 to 5% of adults experience symptoms in their lifetime.[4] L5 radiculopathy is the single most common lumbosacral radiculopathy. Between 63 and 72% of patients with lumbosacral radiculopathy experience paresthesia, 35% experience radiation of pain in the lower limb, and 27% of patients endorse numbness.[5]

Guidelines for approaching lumbosacral radiculopathy favor an initial trial of conservative management, including patient education, staying active/exercise, manual therapy (such as McKenzie exercises), and non-steroidal anti-inflammatory drugs (NSAIDs) as first-line treatments [6-8]. The use of McKenzie exercises has been demonstrated to provide some acute symptomatic relief in patients undergoing conservative management for lumbar radiculopathy.[9] Often, the next step in treatment is pain injections, which may include epidural steroid injections, facet injection, or transforaminal injections, which have been shown to provide long-term relief of symptoms. [10]

Selective nerve root block is both a useful diagnostic tool and a therapeutic procedure that has

been growing in popularity in the clinical field. It can be effective in treating lumbar radiculopathy caused by a wide variety of conditions. The procedure itself can be approached in many ways, as deemed appropriate by respective clinicians. This can include different methods of visualization of the spine with placement of the needle and different drug combinations. As with all procedures, SNRB comes with its own set of possible complications. However, major complications are extremely rare, and the benefits largely outweigh the risks. [11]

Facet or zygapophyseal joints are innervated by the medial branches of the dorsal rami and are a common source of chronic spinal pain.[12] Based on the criteria established by the International Association for the Study of Pain, facet joints may be a source of chronic pain in 15-45% of patients with chronic low back pain.[13] Facet joint interventions are used to manage chronic facet-mediated spinal pain with a variable efficacy for short-term and long-term relief.[14] Facet joint pain may be managed by intra-articular injections, medial branch blocks, and neurolysis of medial branch nerves. In fact joint infiltration, a mixture of a local anesthetic and corticosteroid is injected under image guidance with the rationale that the anesthetic will abort the pain spasm cycle and the steroid will reduce inflammation.

Patients And Methods

Methodology

This is an observational study of therapeutic selective nerve root block with facet joint infiltration administered in patients with lumbosacral radiculopathy at tertiary care hospital. All participants provided written informed consent before study enrollment. The study's data was collected between July 2022 and August 2024.

Study Population

All patients initially included in the study described severe low back pain with sciatica for varying duration of three to twelve months. Patients with associated severe co-morbid conditions (i.e., infection, claudication, trauma and tumor, and severe spinal deformity), Age <30 years, extruded disc seen on MRI, patients having motor deficit, Patients unwilling to participate in the study, Patients who did not give written consent were excluded from this study.

All the patients (n=50), after signing written informed consent form related to this study were assessed clinically. A detailed history was obtained, and they were subjected to thorough clinical examination. The findings were noted in the case record form. Radiological investigations (plain X-rays and MRI lumbar spine with screening whole spine) were carried out to confirm the diagnosis and level of lesion. The patients were also assessed pre-operatively using Modified Oswestry Low Back Pain Disability Questionnaire scores.

All patients were given combined spinal nerve root block with Methylprednisolone (1ml) and lidocaine (1ml) in prone position under fluoroscopic guidance after confirmation using 1 mL of Iohexol dye into the safe zone. (Fig. 1, 2) and facet joint infiltration (Fig. 3, 4)

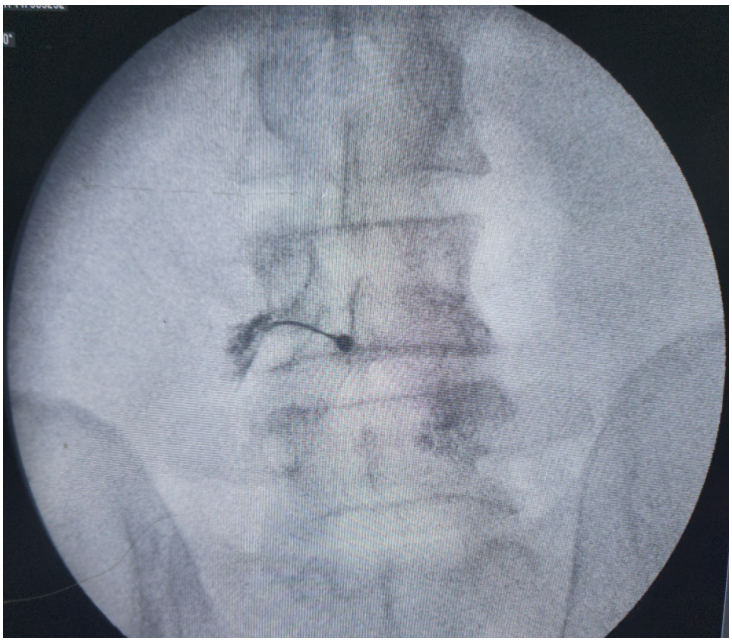

Figure 1: AP fluoroscopy image of L4 vertebra demonstrating the Safe zone after injecting contrast medium

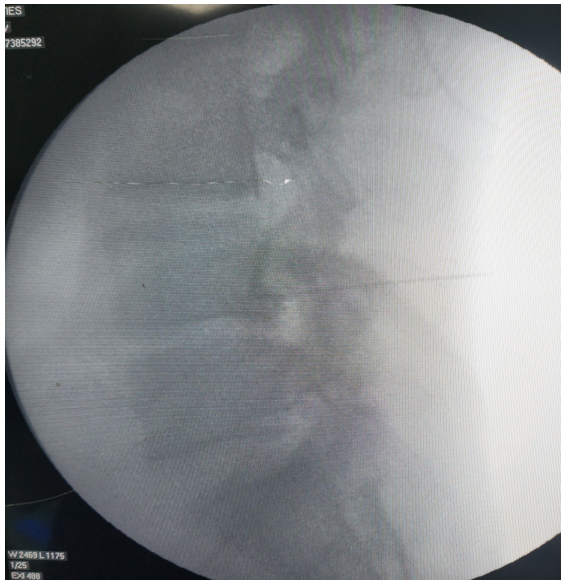

Figure 2: Lateral fluoroscopy image of L4 vertebra demonstrating the entry into intervertebral foramen after injecting contrast medium

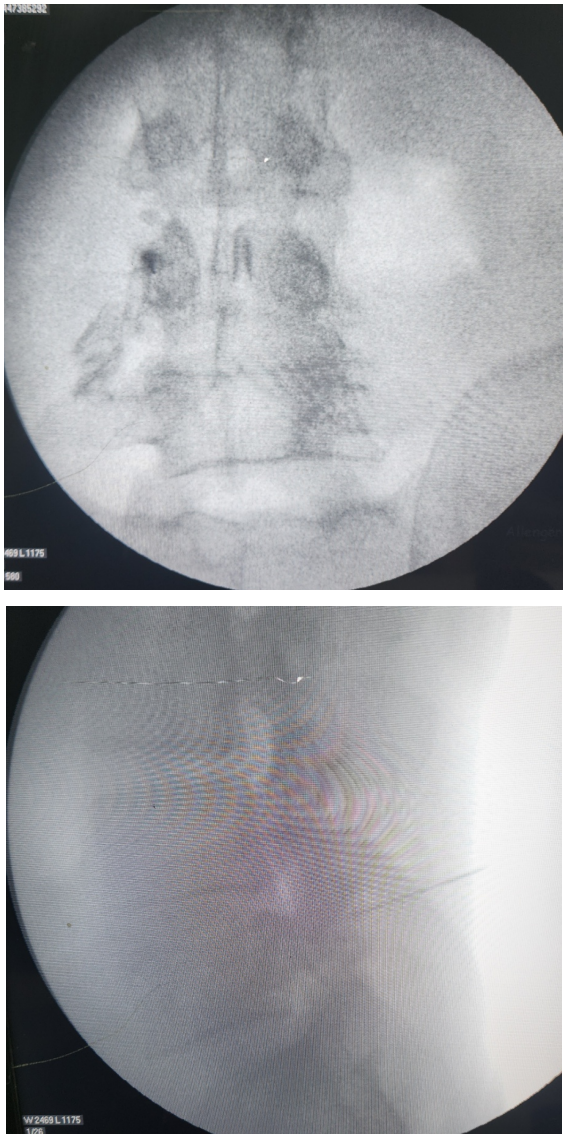

Figure 3 AP and Figure 4: Lateral fluoroscopy image of L4 vertebra demonstrating access into the facet joint after injecting contrast medium

Data Collection

At enrolment, Baseline demographic variables were collected: age, weight, height, BMI, education, occupation, religion, income, address, type of family, socioeconomic status, and co-morbidities. Baseline data collected on pain scores by using Modified Oswestry Low Back Pain Disability Questionnaire for assessing functional limitations impacting daily activities and straight leg raise test measurements (degrees of movement). The diagnosis of lumbosacral radiculopathy was made clinically and confirmed by a finding of lumbar disc prolapse or foraminal stenosis on MRI.

Statistical Analysis

The distribution of different factors was assessed in the whole study population. Those factors included age, gender, presenting symptoms, level of involvement, post procedure symptom improvement and complications. The study population was categorized by the outcomes based on post operative Modified Oswestry Low Back Pain Disability Questionnaire scores assigned as good, fair, and poor. The final outcome, based on Modified Oswestry Low Back Pain Disability Questionnaire (ODI) score was correlated with 4 variables such as age, sex, post-operative symptoms, and complications with the help of Chi-square test.

Results

The follow up ranged from 1 month to 9 months with an average of 5.3 months. Male patients (58%) outnumbered female patients (42%) in incidence. It is more common in the age group of 51 to 60 years (40%) with an average of 54 years. Radicular pain was the most common symptom accounting 100% of the patients whereas straight leg raise test was the most common sign positive in 100% of patients in this study. L4-L5 intervertebral disc was the most common level of disc bulge involved in 62% patients, followed by L5-S1 (18%). 28% patients had moderate disability (score ranging from 21-40%), about 42% patients had severe disability (score ranging from 41- 60%) and about 28% patients had crippling disability (score ranging from 61-80%) on assessing pre-operative Modified Oswestry Low Back Pain Disability Questionnaire score. Average duration of hospital stay was 2 days post-operatively.

Post-operatively the Modified Oswestry Low Back Pain Disability Questionnaire score was as follows- about 6% patient had minimal disability (0-20%), 52% patient had moderate disability (21-40%), 36% patient had severe disability (41-60%) and 6% patient had crippling disability (61-80%). 17 out of 28 males had good outcome whereas 13 out of 22 females had good outcome. 60% patients had good outcome whereas 34% patients had fair outcome. 64% patients had reduction in symptoms post-operatively.

17 patients had minor complications which were nausea (14%), headache (2%), hypotension (6%), nerve root irritation (6%) and local swelling(8%).

The difference between the outcome based on ODI score and post-operative symptoms was statistically significant (X^2 =4.24, p =0.38), remaining variables were not statistically significant.

Discussion

Selective nerve root block is both a useful diagnostic tool and a therapeutic procedure that has been growing in popularity in the clinical field. It can be effective in treating lumbar radiculopathy caused by a wide variety of conditions. The procedure itself can be approached in many ways, as deemed appropriate by respective clinicians. This can include different methods of visualisation of the spine with placement of the needle and different drug combinations. As with all procedures, SNRB comes with its own set of possible complications. However, major complications are extremely rare, and the benefits largely outweigh the risks.

The Outcomes of Selective Nerve Root Block for Disc Induced Lumbar Radiculopathy.1 injection resulted in 46% of patients reporting significant improvement in pain and functional outcome at 1 year [15]. Those graded mild had 4.3 months relief and those graded moderate had 2.5 months relief. Those with severe disc prolapse had no relief except for the immediate post-procedural relief. Only 20% patients had relief up to 6 months [16].

Facet or zygapophyseal joints are innervated by the medial branches of the dorsal rami and are a common source of chronic spinal pain.[12] Based on the criteria established by the International Association for the Study of Pain, facet joints may be a source of chronic pain in 15-45% of patients with chronic low back pain.[13] Facet joint interventions are used to manage chronic facet-mediated spinal pain with a variable efficacy for short-term and long-term relief.[14] Facet joint pain may be managed by intra-articular injections, medial branch blocks, and neurolysis of medial branch nerves. In facet joint infiltration, a mixture of a local anesthetic and corticosteroid is injected under image guidance with the rationale that the anesthetic will abort the pain spasm cycle, and the steroid will reduce inflammation.

With facet joint infiltration, 93% patients had pain relief at 1-month and as many as 62% patients sustained this benefit at 6-month follow up, without complication.[17]

In this study, we used the Modified Oswestry Low Back Pain Disability Questionnaire score [18] to

evaluate our results. This score was used as it is simple for assessment of the patients' outcomes, both subjectively and objectively. It also helps in correlating the results to various factors that may influence the outcome such as age, sex, duration of post- operative symptoms and complications.

Conclusion

Therapeutic spinal nerve root block and facet joint infiltration with Methylprednisolone with lidocaine is a well-established modality of treatment for lumbosacral radiculopathy. Consistently good to fair results (of 94%) in this study can be attributed to- good selection of cases, meticulous use of technique for administering the blocks and good follow through physiotherapy. The results of Therapeutic spinal nerve root block and facet joint infiltration are good when there is agreement between clinical presentation and imaging studies, as was seen in this study. Also, these procedures are minimally invasive and can be administered with relative ease under local anesthesia. Patient does not face the apprehension of a major surgical procedure. Many patients had immediate pain relief and post-operative reductions of symptoms were lasting for an average duration of 6 months, when combined with lumbar traction and physiotherapy. As with all procedures, spinal nerve root block and facet joint infiltration comes with its own set of possible complications. However, these complications are minor and can be managed with conservative treatment. The variables which were found to be correlating with the outcomes were post-operative symptoms and complications. Age and sex variables had no correlation with the outcome.

References

1. Alexander CE, Weisbrod LJ, Varacallo M. Lumbosacral Radiculopathy. [Updated 2024 Feb 27]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK430837/
2. Inoue, N.; Orias, A.A.E.; Segami, K. Biomechanics of the Lumbar Facet Joint. Spine Surg. Relat. Res. 2020, 4, 1–7.
3. Al Qaraghli MI, De Jesus O. Lumbar Disc Herniation. [Updated 2023 Aug 23]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan
4. Tarulli AW, Raynor EM. Lumbosacral radiculopathy. Neurol Clin. 2007 May;25(2):387-405.
5. Brown HA, Pont ME. Disease of lumbar discs. Ten years of surgical treatment. J Neurosurg. 1963 May; 20:410-7.
6. National Clinical Guidelines for non-surgical treatment of patients with recent onset low back pain or lumbar radiculopathy. Stochkendahl Stochkendahl, Per Kajer, Hartivsen J, et al. https://www.researchgate.net/publication/316335665_National_Clinical_Guidelines_for_non-surgical_treatment_of_patients_with_recent_onset_low_back_pain_or_lumbar_radiculopathy Eur Spine J. 2017;27:12–42.
7. Clinical practice guidelines for the noninvasive management of low back pain: a systematic review by the Ontario Protocol for Traffic Injury Management (OPTIMa) Collaboration. Wong JJ, Côté P, Sutton DA, et al. https://www.ncbi.nlm.nih.gov/pubmed/27712027. Eur J Pain. Pain; 21:201–216.
8. The effectiveness of the McKenzie method in addition to first-line care for acute low back pain: a randomized controlled trial. Machado LA, Maher C, Herbert E, Clare H, McAuley J. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2842230/ BMC Med. 2010;8:8–10
9. A randomized controlled trial comparing the McKenzie method to motor control exercises in people with chronic low back pain and a directional preference. Halliday MH, Pappas E, Hancock MJ, Clare HA, Pinto RZ, Robertson G, Ferreira PH. https://www.ncbi.nlm.nih.gov/pubmed/27170524. J Orthop Sports Phys Ther. 2016; 46:514–522.
10. Epidural steroids in the management of chronic spinal pain: a systematic review. Abdi S, Datta S, Trescot AM, et al. Pain Physician. 2007; 10:185–212.
11. Yang, J.C.R.; Chiu, S.T.; Oh, J.Y.-L.; Kaliya-Perumal, A.-K. Selective Nerve Root Block in Treatment of Lumbar Radiculopathy: A Narrative Review. *Surgeries* 2022, *3*, 259-270. https://doi.org/10.3390/surgeries3030028
12. Sehgal N, Shah RV, McKenzie-Brown A, Everett CR. Diagnostic utility of facet (zygapophysial) joint injections in chronic spinal pain: A systematic review of evidence. Pain Physician. 2005; 8:211–24.
13. Merskey H, Bogduk N. Descriptions of chronic pain syndromes and definition of pain terms. 2nd ed. Seattle, WA: IASP Press; 1994. Classification of chronic pain; pp. 180–1.
14. Boswell MV, Colson JD, Spillane WF. Therapeutic facet joint interventions in chronic spinal pain: A systematic review of effectiveness and complications. Pain Physician. 2005; 8:101–14.
15. Singh S, Kumar S, Chahal G, Verma R. Selective nerve root blocks vs. caudal epidural injection for single level prolapsed lumbar intervertebral disc - A prospective randomized study. J Clin Orthop Trauma. 2016;8(2):142–147. doi: 10.1016/j.jcot.2016.02.001

16. Arun-Kumar K, Jayaprasad S, Senthil K, Lohith H, Jayaprakash KV. The Outcomes of Selective Nerve Root Block for Disc Induced Lumbar Radiculopathy. Malays Orthop J. 2015 Nov;9(3):17-22. doi: 10.5704/MOJ.1511.002. PMID: 28611904; PMCID: PMC5393129.
17. Chaturvedi A, Chaturvedi S, Sivasankar R. Image-guided lumbar facet joint infiltration in nonradicular low back pain. Indian J Radiol Imaging. 2009 Feb;19(1):29-34.
18. Fairbanks JCT, Couper J, Davies JB, et al. The Oswestry Low Back Pain Disability Questionnaire. Physiotherapy. 1980; 66:271-273