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Case Series

Selective nerve root block for management of symptomatic lumbosacral disc bulge causing radicular pain: A case series

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ABSTRACT

Background: Back pain being the most common complaint faced by medical practitioner poses a great burden over health system. Clinical examination, MRI helps in making diagnosis in this spectrum of diseases. Of many modalities available selective nerve root block offer a micro invasive alternative for treatment and even evaluation of patients.

Materials and Methods: Peri-ganglionic selective nerve root block given in patient after complete clinical and radiological evaluation of patient. Patient was postoperatively followed up for 6 months with augmentation with physiotherapy and traction. Functional evaluation of patient done using VAS score, Modified Oswestry lower back pain disability questionnaire 6 months post-operatively.

Results: 25 patients included in this study showed a female prevalence with majority patients from 45-60 years of age group. L4 was the most common nerve root involved. In the study significant reduction in VAS score, Modified Oswestry lower back pain disability questionnaire score 6 month post-operatively found. VAS score was reduced from 8.24 to 3.28 and Modified Oswestry lower back pain disability questionnaire score from 31 to 12.76.

Conclusion: Selective nerve root block is an effective method for evaluation and treatment of degenerative spine diseases patients. Which provide significant pain and symptomatic relief. Accompanied with vigorous back strengthening exercises this can offer a good functional outcome. This can act as a good screening tool for patients with degenerative spine diseases without red-flag signs for operative intervention. Future studies are warranted on this with larger sample size.

1. Introduction

Back pain is the most common complaint with which patient present to medical practitioner, with incidence and prevalence on continuous rise since last 2 decades.[1] Degeneration of intervertebral disc or bony elements of spine plays a major role in pathophysiology of lower back pain.[2,3] Ligament flavum hypertrophy, disc herniation, neural foraminal stenosis and facet hypertrophy these are the few major contributors among degenerative spine disease for lower back pain with radiculopathy.[4] These conditions may be associated with motor involvement or tingling numbness.[4]

Clinical diagnosis of lower back pain with radiculopathy is done mainly with dermatome of distribution of pain and nerve strech test.[5] Straight leg raise test, Lasegue/Bragard test, slump test and bowstring sign are few of the test used in clinical evaluation of lower back pain with radiculopathy.[5–7] MRI is the workhorse among the diagnostic techniques for making diagnosis of degenerative lumbar spine diseases for neural involvement.[8] Electromyographic (EMG) and Nerve conduction velocity (NCV) tests using SNAP and

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CMAP may be helpful in cases where clinico-radiological co-relation is not present.[9] Selective nerve root blocks can also be used for evaluation of nerve root level and exact cause of pain.[10]

Vast spectrum of treatment options are fiavailable ranging from simple use of NSAIDs with rest, traction physiotherapy, IFT, sono physiotherapy, epidural injections, selective nerve root block to operative procedures like open decompression, percutaneous endoscopic decompression.[11–15] Surgery is the 1^{st} line of management if patient is having any of the red flag signs like bowel and bladder involvement and neurological deficit.[16] Because of the natural history of disc regress, the majority of patients with lumbar radiculopathy will recover without surgery.[17] Hence mild to moderate cases without the red flag signs steroid with local anaesthetic injection targeted to affected nerve root can reduce inflammation thus the pain.[18] These SNRBs can be therapeutic or diagnostic, for a SNRB to be therapeutic addition of steroid apart from the regular local anaesthetic is necessary.[19] A single level disc bulge radiculopathy patient is the ideal candidate for procedure as multilevel injections can have complications.[20]

Here in this study we tried to find out the effectiveness of SNRBs for evaluation and treatment of the degenerative lumbar spine diseases.

2. Materials and Methods

This study is a prospective study of 25 patients admitted under orthopaedic ward at our tertiary care hospital in central India. Study was initiated after IEC clearance. Patient detailed history taken and examination done to know about the involved dermatome and the level of disease. Plain radiographs and MRI of the Lumbosacral spine done.

Patient's recruitment was done according to following inclusion and exclusion criteria.

2.1. Inclusion criteria

1. Patients having age >30 years.
2. Patient having signs and symptoms of lumbosacral radiculopathy.
3. Patients giving written informed consent for the procedure.

2.2. Exclusion criteria

1. Patient with neurological deficit, bowel bladder involvement.
2. Patients having signs of active spine infections.
3. Patient having skin infection over the lumbosacral region.
4. Patients not giving written informed consent for procedure.

Peri-ganglionic lumbar nerve root of involved segment is targeted in this study. Patient kept prone on fluoroscope compatible operation table. With the help of C-arm guidance in AP and lateral view safe triangle is targeted with the help of 18G spinal needle after giving local anaesthesia for skin. Appropriate positioning of needle is confirmed using radio-opaque (iohexol) dye. After confirmation of position steroid and local anaesthetic mixture (40mg Triamcinolone[1cc]+ 0.5% Inj. bupivacaine[1cc]) injected. Sterile dressing applied and postoperatively all patients recived oral antibiotic prophylaxis, post procedure physiotherapy protocol.

Lower back strengthening exercises were started and the patients were mobilized immediately after procedure, with full weight-bearing walking. Patients were followed up on 1^{st} 3^{rd} and 6^{th} month post operatively. Every time functional assessment and clinical examination was done. Patients were evaluated using the VAS score,[21] Modified Oswestry lower back pain disability questionnaire.[22]

3. Results

This study comprised of 25 patients with lower back pain with radiculopathy. Majority of patients involved in study were females with contribution of 68% of all. Male patients contributed for 32%. Mean age of presentation was 52.4 years ±13.02 with range 30-77years. Majority of patients (52%) presenting were homemaker by occupation.

Mean BMI of patients presenting to hospital was 27.19 ± 3.17, belonging to overweight segment. Patient included in this study was having symptoms for mean time of 14.84 +/- 10.46 months (range 6-36 months). All patients included in study was having radiculopathy symptoms with 48% of patients having bilateral symptoms.

Mean VAS score at the time of presentation was 8.24 ± 1.05. with majority of cases having L4 nerve root involvement (36%). Rest 4% patients had L3 nerve root involvement, 4% were having L3 and L4 nerve root involvement, 24% were having L3 and L4 nerve root involvement, and 32% had L5 root involvement. All patient enrolled under this study was having Passive SLR test positive with 72% having Lasegue test and 52% were having bowstring sign positive. Pre-procedure mean VAS score was 8.24±1.05 which was reduced to 3.28±1.42 six months post-operatively. There was significant reduction of pain post procedure but 8% of cases showing relapse of pain. Modified Oswestry lower back pain disability questionnaire score showed significant reduction from 31.6± 5.29 (pre-procedure) to 12.76±6.22 (6 month post-procedure). According to this scale cases with moderate disability was shifted to minimal disability 6 months post-operatively.

Table 1: Epidimological patient variables

Patient variables		Value
Gender	Male	32%
	Female	68%
Age group	30-45 years	24%
	45-60 years	44%
	>60 years	32%
Radiculopathy	Right	32%
	Left	20%
	Bilateral	48%
Level of nerve root	L3	4%
	L3 and L4	4%
	L4	36%
	L4 and L5	24%
	L5	32%

Table 2: Pre-procedure and post post-procedure score comparison

Scoring System	Pre-procedure	6 month post procedure
VAS score	8.24 ± 1.05	3.28 ±1.42
Modified Oswestry lower back pain disability questionnaire score	31.6 ± 5.29	12.76 ± 6.22

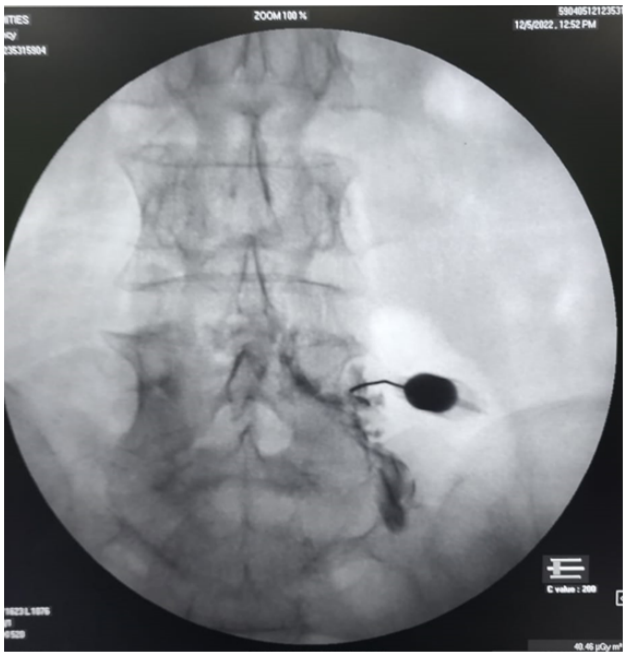

Fig. 1: Intra-procedure Carm shoot AP view

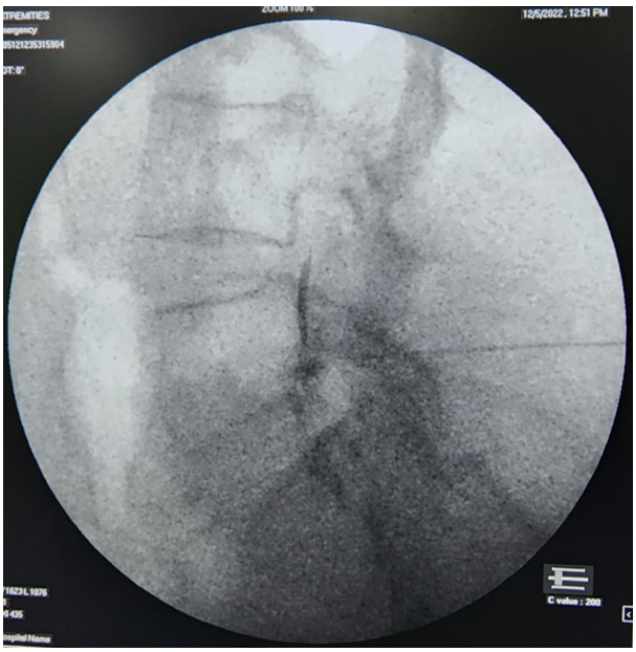

Fig. 2: Intra-procedure Carm shoot Lat view

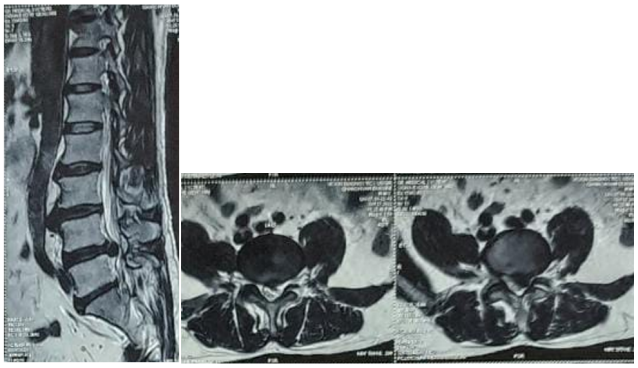

Fig. 3: MRI image showing disc buldge

4. Discussion

Majority patients with lower back pain and radiculopathy without red-flag signs will improve with conservative management.[23] SNRB may be used as either a therapeutic or diagnostic procedure for identifying pain-mediating nerve roots.[24] Its therapeutic efficacy is unpredictably brief in the majority of individuals, and recurrences are anticipated.[25] Yet, it might buy time with pain alleviation.[26] Although, long lasting effect of drug is unpredictable, long term improvements are possible.[25] Typically, the initial impact is due to the administered local anaesthetic, which wears off within a few hours. The steroid begins functioning in around two or three days, and its impact might continue anywhere from a few days to many months.[24] Nonetheless, it remains an effective, less costly, and quicker option to surgery.

In our study, 25 patients were included in the study of which 17(68%) of patients were female and rest were male. Mean age of presentation being 52.4 year with maximum patient from 45-60years of age slab (44%). These demographic findings were comparable with study conducted by Kanaan T et al,[21] showing majority of cases from age group of 40-60years of age i.e. 51% and 32.8% males and 67.2% females in included study population.

In our study L4 was the most common nerve root involved (36%). Showing similar results as of Kanaan T et al.[21] with maximally involved root being L4 level root (32%).

Our study showed significant reduction in mean VAS score from 8.24 to 3.28 also mean Modified Oswestry lower back pain disability questionnaire score reduced from 31(moderate disability) to 12.76 (mild disability), Showing a significant improvement in the functional outcome 6 month post procedure. In our study 2 cases (8%) showed relapse in pain post-procedure 6 month despite showing significant improvement in immediate post procedure score. These results were significantly better than those shown with Kanayama M et al.[27] study, showing improvement in only 51.7% cases. Also study conducted by Kanaan T et al.[21] showed avoidance of any operative procedure in 54% of cases because of SNRBs. Study by Kanna RM et al. showed 75.8% success rate in 91 patients who underwent SNRB. Bias in our study can be accounted due to traction and physiotherapy given to patients postoperatively and selection of single level disc bulge.

This study showed promising results of selective nerve root blocks in patient with degenerative spine disease however smaller sample size being its weakness. Future studies are warranted with larger sample size for validation of results.

5. Conclusion

Selective nerve root block is an effective method for evaluation and treatment of degenerative spine diseases patients. Which provide significant pain and symptom relief. Accompanied with vigorous back strengthening exercises this can offer a good functional outcome. Cases which didn't respond to this modality of treatment, those having multiple level disease pathology may need operative intervention in future, But SNRB can act as good screening tool for patients with degenerative spine diseases without redflag signs for operative intervention.

6. Source of Funding

None.

7. Conflict of Interest

None.

8. Ethical Approval

IEC approval obtained before starting the study.

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