

To Study the Clinical and Functional Assessment of Pain Blocks in the Management of Low Back Pain

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1. Background

Low back pain is one of the most common morbidities affecting humans with a lifetime prevalence reported to be around 60% to 80%. Among the causes of low back pain, prolapsed intervertebral disc is one of the most common cause. The disc causes mechanical compression from the nerve roots with the release of inflammatory products, which give rise to radicular symptoms and pain. Spinal steroid injections have been used through different routes as an alternative to surgery or adjuvant to conservative therapy. In patients with severe comorbidities pain block is an option to provide higher life quality.

Several approaches are available to access the lumbar epidural space: transfacetal, transforaminal and caudal epidural. The transfacetal entry is directed more closely to the assumed site of pathology requiring less volume than caudal route. The transforaminal approach is target specific using the smallest volume in fulfilling the aim of reaching the primary site of pathology. The caudal entry is relatively easily achieved with minimal risk of inadvertent dural puncture, but requires high volumes of injectate to reach target structures.

When nerve root injury is associated with a disc herniation or lateral bony stenosis, most patients receive substantial benefit from transforaminal block. Similarly, patients with acute back and leg pain with diffuse involvement of spine benefited from caudal epidural blocks. Meniscoid entrapment, synovial impingement, capsular and synovial inflammation, mechanical injury and facetarthropathy are varied causes of back pain originating from the facets which had benefit from transfacetal blocks.

2. Materials and Methods

This study was conducted at SMIMER institute in Department of Orthopaedics, Surat from May 2015 to November 2017. 227 patients who were given pain blocks during this period are included in this study. It was a prospective Cohort study.

Patients having low back pain with or without leg pain were screened through the eligibility criteria and were evaluated clinically and radiologically. As per the nature of the clinical and radiological findings, patients were given either transfacetal, transforaminal, transfacetal with caudal epidural, transforaminal with caudal epidural or transfacetal with transforaminal blocks.

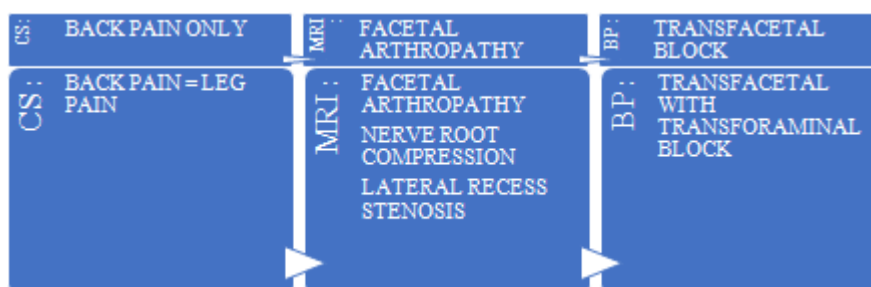
Inclusion Criteria

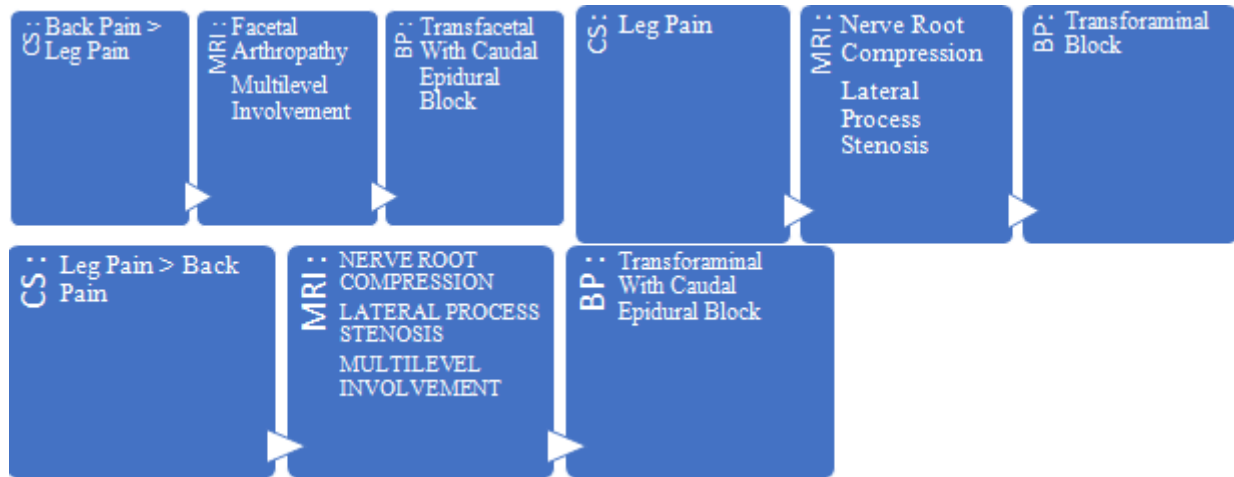
- 1) Age – 18 to 80 years
- 2) Lumbar contained discs on MRI (prolapsed or protruded discs)
- 3) Lumbar canal stenosis
- 4) Previous spinal surgery
- 5) Spondylolysis without spondylolisthesis

Exclusion Criteria

- 1) Uncontained discs(extruded or sequestered)
- 2) Cauda equina syndrome
- 3) Infection
- 4) Patients on anticoagulant therapy
- 5) Patients with neurological deficits

Based on the patient's clinical symptoms and MRI findings, the block given is based on following algorithm.





CS = Clinical Symptoms, MRI = MRI findings, BP = Block Performed.

Above patients with associated coccydynia, spondylolysis and sacro-iliac pain were given coccyx block, pars block and sacro-iliac block respectively.

Those patients having unilateral symptoms / bilateral symptoms were given unilateral / bilateral blocks respectively.

Those patients having single level / multilevel pathological involvement on MRI were given single level / Multilevel blocks respectively. Multilevel pathology with diffuse involvement (3 or more levels) were preferably given caudal epidural blocks.

Materials used for pain block are as given below.

- Appropriate syringe and needle for local anaesthesia
- Lignocaine 2% without epinephrine
- Spinal needle – 22 gauge, 3 ½ inch
- Injection syringe, 2 ml (1 syringe per facet)
- Injectable steroid (Triamcenolone)

3. Results

The detailed analytical observation of 227 patients with back pain who were treated with pain blocks was done in the department of orthopaedics, SMIMER Hospital, Surat between may 2015 to November 2017 is as follows.

Table 1: Age Distribution

Age Group	No. of Patients	Percentage
18-40	103	45.37%
40-60	83	36.56%
>60	41	18.06%
TOTAL	227	100%

This data shows that the most common age group was 18 – 40 years. About 45% of patients came under this age group.

Table 2: Sex Distribution

Sex	No. of Patients	Percentage
Male	118	51.98%
Female	109	48.02%
Total	227	100%

118 patients were male and 109 patients were female in this study. Male to female ratio in this study was approximately 1 : 1.

Table 3: Unilateral / Bilateral Block

Block	No. of Patients	Percentage
Unilateral Block	63	27.75%
Bilateral Block	164	72.25%
Total	227	100%

In this study 63 pain blocks were unilateral while 164 pain blocks were bilateral.

Table 4: Single / Multilevel Blocks

Block	No. of Patients	Percentage
Single Level	111	48.90%
Multi Level	116	51.10%
Total	227	100%

A total of 111 single level and 116 multi level pain blocks were performed in this study.

Table 5: Types of Pain Blocks

Pain Block	No. of Patients	Percentage
Transfacetel	31	13.66%
Transforaminal	11	4.85%
Transfacetel with Transforaminal	40	17.62%
Transfacetel with Caudal Epidural	57	25.11%
Transfacetel with Caudal Epidural	88	38.77%
Total	227	100%

Table 6: The Average VAS Score

Pre – Op	5.05
3 Weeks Post Op	4.08
3 Months Post Op	3.58
6 Months Post Op	2.83

VAS Score – Visual Analog Scale for Pain

The average VAS Scores at pre op, 3 weeks, 3 months and 6 months post op were 5.05, 4.08, 3.58 and 2.83 respectively.

Table 7: MODI Score

Pre – Op	51.13
3 Weeks Post Op	41.83
3 Months Post Op	37.33
6 Months Post Op	29.88

The average MODI scores at pre op, 3 weeks, 3 months and 6 months post op were 51.13, 41.83, 37.33 and 29.88 respectively.

We calculated SF 36 score and analysed it by using the mean of total score by using parameters of SF 36 score. The parameters were:

- 1) Physical Functioning (PF)
- 2) Role Physical (RP)
- 3) Bodily Pain (BP)
- 4) General Health (GH)
- 5) Vitality (VT)
- 6) Social Functioning (SF)
- 7) Role Emotional (RE)
- 8) Mental Health (MH)
- 9) Physical Component Score (PCS)
- 10) Mental Component Score (MCS)

Below is the comparison of SF 36 Score.

Table 8: SF 36 Score

SF 36 Scale	Pre Op	Post Op
PF	43.03	64.07
RP	3.43	70.91
BP	39.96	60.62
GH	33.89	47.21
VT	49.34	57.12
SF	44.52	63.94
RE	98.67	98.67
MH	71.43	72.99

Table 9: SF 36 Score Summary

Score	Pre Op	3 weeks	3 months	Post Op
PCS	24.08	31.02	34.29	39.27
MCS	54.11	53.19	52.80	52.21

The average SF 36 scores pre and post op for PCS was 24.08 and 39.27 respectively and MCS was 54.11 and 52.21 respectively.

Similarly, pre and post op VAS, MODI and SF 36 scores were compared to determine the efficacy for individual types of blocks. The results are as follows:

Table 10: Transforaminal Block

PRE OP VAS	5
POST OP VAS	2.72
PRE OP MODI	46.18
POST OP MODI	28.18
PRE OP PCS	26.87
POST OP PCS	40.03
PRE OP MCS	54.99
POST OP MCS	50.76

Table 11 : Transfacetal Block

PRE OP VAS	5.26
POST OP VAS	2.65
PRE OP MODI	55.74
POST OP MODI	27.61
PRE OP PCS	22.54
POST OP PCS	40.20

PRE OP MCS	53.21
POST OP MCS	51.70

Table 12: Transfacetal with Transforaminal Block

PRE OP VAS	4.88
POST OP VAS	2.75
PRE OP MODI	48.05
POST OP MODI	28.90
PRE OP PCS	25.10
POST OP PCS	39.64
PRE OP MCS	54.15
POST OP MCS	52.57

Table 13 : Transfacetal with Caudal Epidural Block

PRE OP VAS	5.05
POST OP VAS	2.98
PRE OP MODI	50.04
POST OP MODI	30.46
PRE OP PCS	24.27
POST OP PCS	38.32
PRE OP MCS	54.57
POST OP MCS	51.92

Table 14: Transforaminal with Caudal Epidural Block

PRE OP VAS	5.02
POST OP VAS	2.80
PRE OP MODI	52.20
POST OP MODI	29.75
PRE OP PCS	23.82
POST OP PCS	39.99
PRE OP MCS	54.24
POST OP MCS	52.07

The efficacy of the study was calculated based on Post Op VAS Score at 6 months and divided as Good, Fair and Poor as follows:

Post Op VAS Score at 6 Months		
Post Op VAS	No. of Patients	Percentage
VAS 1-3 (Good)	136	59.91%
VAS 4-5 (Fair)	48	21.15%
VAS 6-10(Poor)	43	18.94%
Total	227	100%

Total 136 patients had good results with pain block therapy while 43 patients had poor results. 48 patients had fair results with pain block therapy.

4. Discussion

Efficacy of epidural steroid injections vary according to the site of pathology. Moreover, transforaminal, caudal epidural, interlaminar and transfacetal injections have different efficacy rates. The main intent of this study was to clinico-radiologically find the site of pathology and deliver the

appropriate type of injection, as proposed in the treatment algorithm.

In this study, we performed transforaminal with caudal epidural blocks (n=88) and transforaminal blocks (n=11) with local anaesthetic and steroid. Follow up at 6 months, on comparing the VAS, SF and MODI scores, we found the difference to be significant. We did not perform any repeat procedure. We administered caudal epidural blocks in most of our patients as they had back pain with radicular pain with > 2 levels of involvement. We also included patients with foraminal stenosis in our study.

In this study, we performed transfacetel with caudal epidural blocks (n=57) and transfacetel blocks (n=31) with local anaesthetic and steroid. Follow up at 6 months, on comparing the VAS, SF and MODI scores, we found the difference to be significant. We did not perform any repeat procedure. We also gave caudal epidural blocks in patients having > 2 levels of involvement.

Those patients having back pain and leg pain with involvement of facets and foramina on MRI were given transfacetel and transforaminal block(n=40). Their VAS, SF 36 and MODI scores at the end of 6 months were significant.

Thus we can conclude that proper identification of site of pathology through clinico – radiological co-relation and appropriate type of epidural steroid to be administered provides efficacious results. Also, spinal pain blocks is an effective modality of treatment of low back pain disorders with improvement in clinical and functional outcomes.

5. Conclusion

- 1) Pain blocks are efficacious in improving clinical outcome of patients with low back pain.
- 2) Pain blocks also improve the functional outcome of patients with low back pain disorders.
- 3) Spinal pain blocks are rarely associated with any complications.
- 4) Proper co-relation of clinico – radiological features in each case is necessary to decide the type of block to be given. With more than one site of pathology in a single patient, combined blocks is an effective treatment modality.

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