



International Journal of Orthopaedics Sciences

ISSN: 2395-1958
IJOS 2019; 5(2): 235-240
© 2019 IJOS
www.orthopaper.com
Received: 10-02-2019
Accepted: 12-03-2019

Dr. AR Narayanan
Government Villupuram Medical
College and Hospital,
Villupuram, Tamil Nadu, India

Dr. L Ponnappan
Government Villupuram Medical
College and Hospital,
Villupuram, Tamil Nadu, India

Therapeutic role of Trans - foraminal nerve root block in management of lumbar radiculopathy

Dr. AR Narayanan and Dr. L Ponnappan

DOI: <https://doi.org/10.22271/ortho.2019.v5.i2e.27>

Abstract

Treatment of Acute Lumbar Radicular pain has many controversies. While pure mechanical compression was considered previously as a source of sciatica, there is increasing evidence that chemical irritation of the nerve root plays an essential and perhaps even more important role. Trans foraminal selective nerve root block is an approved method for management of radicular pain. The aim of our study was to conduct a prospective study, 1. To assess the adequacy of relief provided by trans-foraminal Nerve Root Block for Lumbar Radicular pain. 2. To determine the effectiveness of selective (trans-foraminal) nerve root injection in diagnosis and treatment of patients with Lumbar radiculopathy. 28 patients with radicular pain involving single nerve root were selected. Trans-foraminal selective nerveroot block was done as per standard technique. Results were analyzed using VAS Score & RMDQ Score. Analyzing results showed that 89.3% patients had improvement. RMDQ score were reduced by 61% by end of 6 months. 18 patients (85.7%) who are on more than 6 months of follow up are able to do their daily activities without difficulty. We conclude by our study that, the trans-foraminal nerve root block combined with careful history, physical examination and quality radiolographic studies, is an important tool in the diagnosis and treatment of patients with predominant Lumbar radicular symptoms.

Keywords: Radiculopathy, Trans-foraminal nerve root block, VAS, RMDQ score

Introduction

Treatment of Acute Lumbar Radicular pain has many controversies. Most authorities recommend bed rest, anti-inflammatory medication and physical therapy (Riew *et al.* JBJS 1982 and Tulder *et al.* Spine 22–1997) Comparing the results of operative and conservative treatment in selected patients, many authors (Weber *et al.* Hakelius *et al.*)^[1], found not much significant difference after first year and no difference after 4 years. However many patients treated conservatively complains of persistent pain and seek further intervention.

The pathophysiology underlying radicular pain is poorly understood and it is thought that nerve root compression is a key factor and from a surgical perspective, nerve root decompression is considered to be the key therapeutic step. However, in patients with severe lumbar canal stenosis, radicular pain is not a typical feature.

Aims and objectives

To conduct a prospective study

1. To assess the adequacy of relief provided by trans-foraminal Nerve Root Block for Lumbar Radicular pain.
2. To determine the effectiveness of selective (trans-foraminal) nerve root injection in diagnosis and treatment of patients with Lumbar radiculopathy.

Inclusion criteria

1. Low back ache not relieved by medicines and physical methods.
2. Radiating pain to lower limb not relieved by medicines and physical method.
3. Positive Lasegues test.

Exclusion criteria

- Presence of neurological (motor) deficit

Correspondence
Dr. L Ponnappan
Government Villupuram Medical
College and Hospital,
Villupuram, Tamil Nadu, India

- Local infection
- Coagulopathies

Those patients with complaints of lumbar radiculopathy demonstrating a positive unilateral Straight Leg Raising test (SLRT) within 30-60 degrees were included.

MRI was done in all patients to look for mechanical lesions. Only those patients with intervertebral disc lesions affecting a single lumbar nerve root were selected for the study. Those patients with more of back pain, than radiating pain were excluded. Those with bilateral symptoms, multiple nerve root involvement and neurological weakness were excluded.

Materials and methods

Technique

All trans-foraminal Nerve Root Blocks were performed as inpatient procedures without premedication. Informed consent was obtained. Under aseptic precautions, under X ray

fluoroscopy guidance, the nerve root was identified (Safe Triangle). 1 ml of lignocaine and 1 ml of Depomedrol is injected at the nerve root.

All patients underwent a standardized program of intensive physical therapy, which included procedures for local pain relief and reconditioning exercises for the spinal muscle, for at least 6 weeks after the procedure.

Pain severity was assessed immediately after the procedure and after 6hrs. Then after 24hrs. Patient was discharged the next day. Follow up was done weekly for upto 1 month. Then monthly for 6 months. Pain severity was evaluated using various assessment scales (visual analogue scale, Rolland – Morris² scale,) and results are analyzed both pre procedure and post procedure. Various parameters like age, sex, nature of work, duration of symptom, amount of pain relief, ability to return back to their regular activities were assessed and the role of selective nerve root block in management of Lumbar Radicular syndrome was studied.

Roland-Morris Questionnaire

1. I stay at home most of the time because of the pain in my back.
2. I change position frequently to try and make my back comfortable.
3. I walk more slowly than usual because of the pain in my back.
4. Because of the pain in my back, I am not doing any of the jobs that I usually do around the house.
5. Because of the pain in my back, I use a handrail to get upstairs.
6. Because of the pain in my back, I lie down to rest more often.
7. Because of the pain in my back, I have to hold on to something to get out of a reclining chair.
8. Because of the pain in my back, I ask other people to do things for me.
9. I get dressed more slowly than usual because of the pain in my back.
10. I only stand up for short periods of time because of the pain in my back.
11. Because of the pain in my back, I try not to bend or kneel down.
12. I find it difficult to get out of a chair because of the pain in my back.
13. My back hurts most of the time.
14. I find it difficult to turn over in bed because of the pain in my back.
15. My appetite is not very good because of the pain in my back.
16. I have trouble putting on my socks (or stockings) because of the pain in my back.
17. I only walk short distances because of the pain in my back.
18. I sleep less because of the pain in my back.
19. Because of the pain in my back, I get dressed with help from someone else.
20. I sit down for most of the day because of the pain in my back.
21. I avoid heavy jobs around the house because of the pain in my back.
22. Because of the pain in my back, I am more irritable and bad tempered with people.
23. Because of the pain in my back, I go upstairs more slowly than usual.
24. I stay in bed most of the time because of the pain in my back.

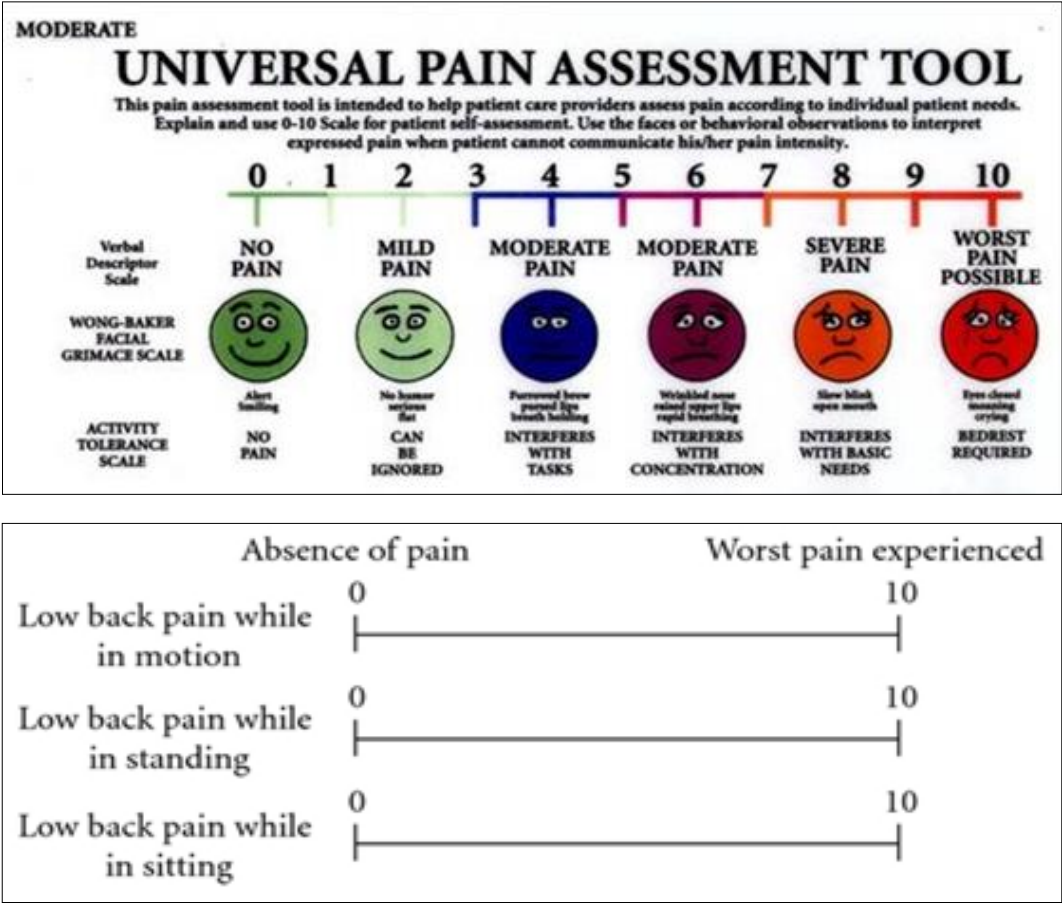


Fig 1: X - ray LS Spine

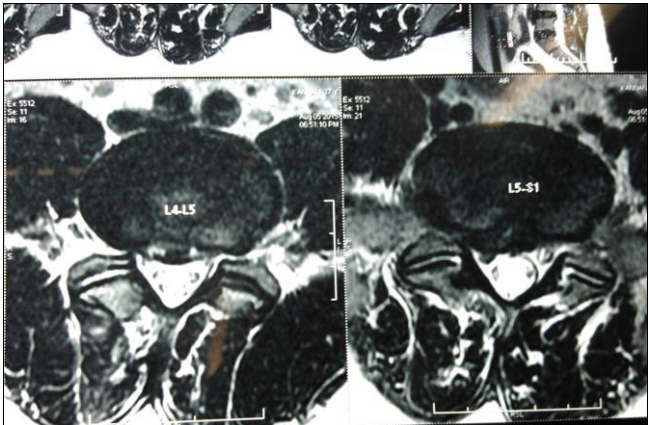


Fig 3: MRI Showing Nerve root compression



Fig 2: MRI showing IVDP

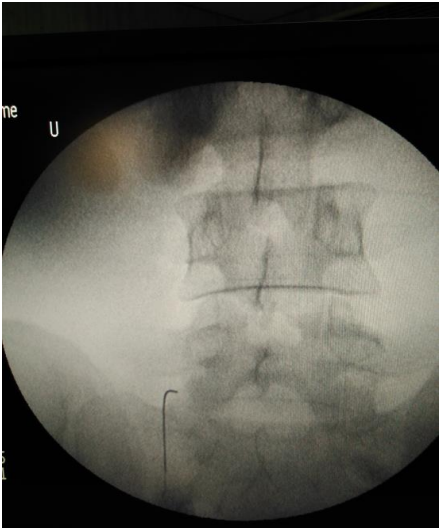


Fig 4: Needle position in safe triangle (C ARM)

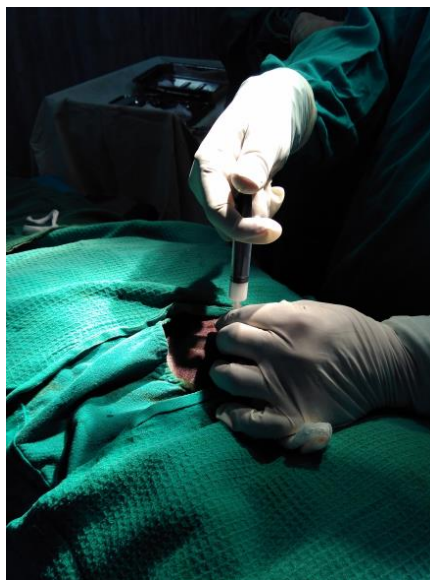


Fig 5: Root block injection

Results

Total no of patients 28 21 patients had L4-L5 disc prolapse which usually affects the L5 nerve root that traverses at this level and exits below the L5 pedicle. 7 patients had L5-S1 disc prolapse that usually affects the S1 nerve root which exits in the first sacral foramina. 25 male & 3 female Patients. Mean Age 38 Yrs (31 – 45) 3 CASES > 60 Yrs. 19 left sided involvement 9 right sided involvement. Mean duration of radicular pain before SNRB 8 Weeks 3 – 13 Weeks for 25 Cases. 3 cases presented late (4-6 months). Degree of disc

prolapse MSU Grading Using MRI: IB-13, 2AB-11, 2B - 4.

Mean numeric rating of pain using VAS before the procedure was 8.03. Mean pre procedural Roland Morris Disability questionnaire score was 20.07.

Mean rating of pain using VAS immediately after the procedure on doing straight leg raising on the affected side was reduced to 1.32 which is due to the local anaesthetic effect. Assessment on doing SLR was done on the day after the procedure. Mean VAS score was 1.8 in 25 patients except 3 cases (VAS was > 5).

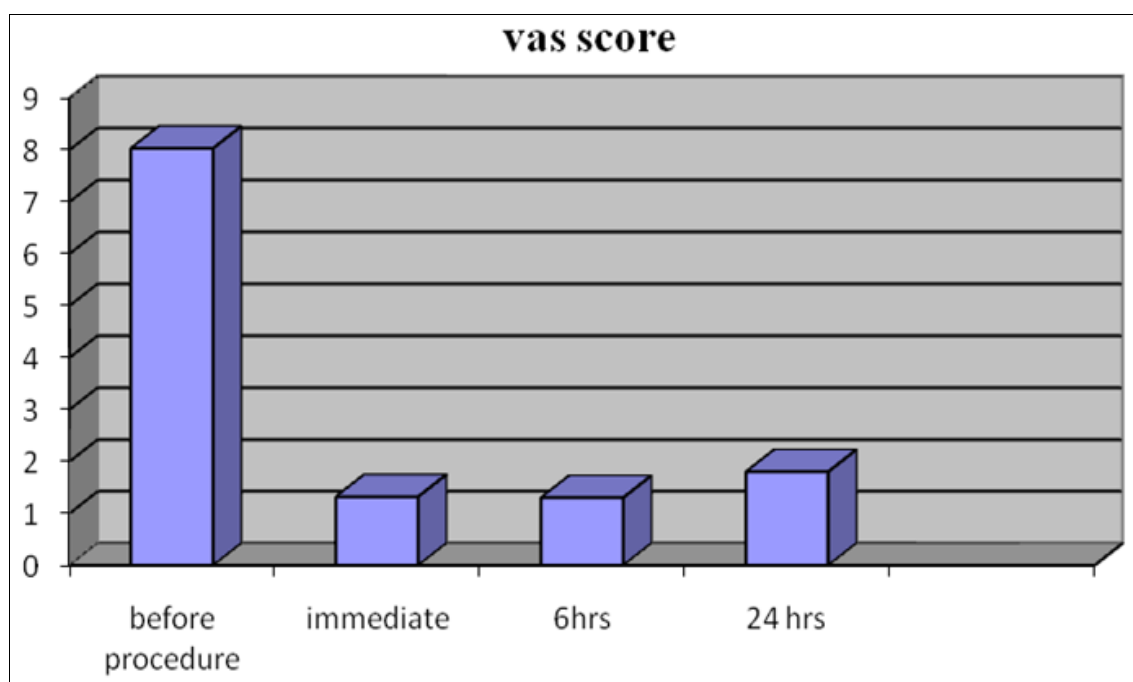


Fig 6: VAS score

All patients were reviewed after one week and were given the Roland Morris Disability questionnaire for back pain and their score was noted. Mean overall RMDQ score at 1 week was 9.96 (n= 25) which denoted improvement. They were on physical therapy. And were advised not to do heavy manual works. 3 patients had RMDQ score more than 15. They were given reassurance. By 3 weeks 3 patients with RMDQ > 15 had symptoms similar to pre procedure. They were excluded from further follow up. Review at one month had mean

RMDQ score of 9.8(n=25). Next follow up was by 3 months mean RMDQ score was 9.48 (n=25).

Mean RMDQ scores at further follow up in 6 months (n=18) was 9.1. Analyzing results showed that 89.3% patients had improvement. RMDQ score were reduced by 61% by end of 6 months. 18 patients (85.7%) who are on more than 6 months of follow up are able to do their daily activities without difficulty.

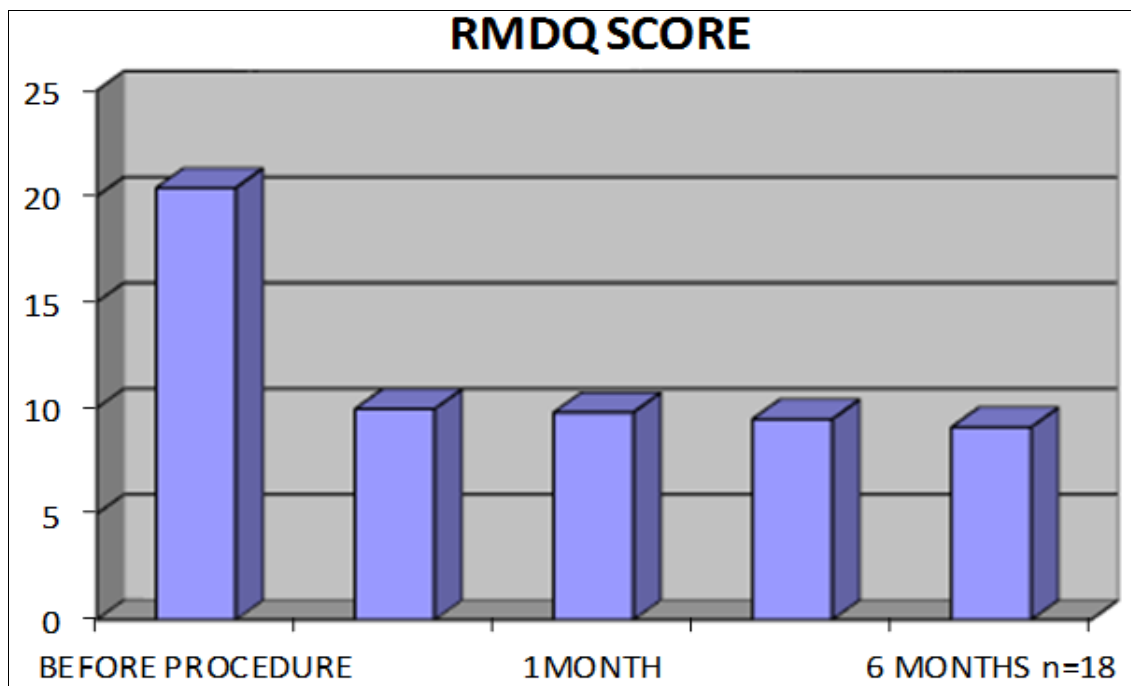


Fig 7: RMDQ score

Discussion

Lumbar disc herniation is one of the few abnormalities in the lumbar spine, where a clear relationship between the morphological alteration and pain seems to exist [3]. Previously, pure mechanical compression was considered as a source of sciatica. But now there is increasing evidence that chemical irritation of the nerve root plays an essential and perhaps even more important role.

Nucleus pulposus has inflammatory properties, which causes intraneural oedema, a very important factor found in the pathogenesis of sciatic pain [4-7]. The inflammatory effect of nucleus pulposus on the nerve root can be greatly reduced by the application of methylprednisolone [8]. The compression of nerve root by nucleus pulposus tissue seems to be self-limiting. Otani *et al.* [9] have shown in an animal model, that this effect is most significant after seven days and spontaneously reduces to normalise within a two month period. These experimental findings explain, why sciatica has a favourable natural history for spontaneous recovery [10]. Surgery in patients presenting with a radiculopathy with or without minor neurological sensory/motor deficit (discectomy/nerve root decompression) is only required, if the initial pain cannot be well controlled by non-operative means. Otherwise, surgery is not required because spontaneous recovery can be expected [10, 11].

Macnab first described selective nerve root blocks in 1971 [12]. This infiltration was aimed to differentiate different sources of leg pain in an equivocal clinical situation. The selective nerve root injection allows the diagnosis of the affected nerve root with a sensitivity of 100% in cases with disc protrusions and with a positive predictive value of 75 to 95% in cases of a canal stenosis [13].

In a prospective study, Weiner and Fraser [14] investigated the effectiveness of nerve root blocks in 30 patients with foraminal and extraforaminal disc herniation. In total, 22 of 28 patients (79%) had a significant and permanent pain reduction during a 1-10 year follow-up. Another study by Martin Narozny, Marco Zanetti, Norbert Boos [15] shows "In 60% of the patients a rapid permanent pain resolution occurred, there was no need for surgery".

One prospective, randomized, controlled, double-blind study by Riew *et al.* was performed in patients who had surgical indications for nerve root decompression and who initially wished to undergo surgery to relieve radiculopathy (J Bone Joint Surg Am. Nov 2000; 82-A(11): 1589-93) [16]. Approximately 71% of those who underwent trans-foraminal injection (anaesthetic + steroids), elected not to have surgery (follow-up, 16 months), whereas only 33% of those injected with bupivacaine (anaesthetic) alone avoided surgery. A subsequent follow-up study [17] in this cohort found that most of the patients who avoided surgical decompression for at least 1 year after undergoing SNRB, continued to avoid operative intervention for a minimum of 5 years.

Zennaro *et al.* [18] found the greatest efficacy of steroid injections in patients who had foraminal stenosis, when compared with those who had foraminal disc herniations. Devulder [19] found that trans foraminal injection with steroids was associated with decreased treatment scores in patients with failed back surgery syndrome also. The average time of pain relief, in various studies, was 1-3 months in those patients that have initial improvement. Although some studies [20] have documented longer relief in a high percentage of patients.

Conclusion

Nerve Root Block is an effective therapeutic tool for Lumbar Radicular pain and is recommended for the initial treatment of this condition. The trans-foraminal nerve root block combined with careful history, physical examination and quality radiographic studies, is an important tool in the diagnosis and treatment of patients with predominant Lumbar radicular symptoms.

References

1. Weber H. Volvo Award in Clinical Sciences. Lumbar disc herniation. A Controlled, prospective study with ten years of observation. Spine. 1982; 8:131-40.
2. Roland M, Morris R. A study of the natural history of back pain. Part I: development of a reliable and sensitive measure of disability in low-back pain. Spine. 1983;

- 8:141-4.
3. Mixer WJ, Barr JS. Rupture of the intervertebral disc with involvement of the spinal canal. *N Engl J Med.* 1934; 211:210-5.
4. Olmarker K, Rydevik B. Pathophysiology of sciatica. *Orthop Clin North Am.* 1991; 22:223-34.
5. Olmarker K, Rydevik B, Nordborg C. Autologous nucleus pulposus induces neurophysiologic and histologic changes in porcine cauda equina nerve roots. *Spine.* 1993; 18:1425-32.
6. Olmarker K, Blomquist J, Strömberg J, Nannmark U, Thomsen P, Rydevik B. Inflammation properties of nucleus pulposus. *Spine.* 1995; 20:665-9.
7. McCarron RF, Wimpee MW, Hudkins PG, Laros GS. The inflammatory effect of nucleus pulposus. A possible element in the pathogenesis of low-back pain. *Spine.* 1987; 12:760-94.
8. Olmarker K, Byrod G, Corneffjord M, Nordborg C, Rydevik B. Effects of methylprednisolone on nucleus pulposus-induced nerve root injury. *Spine.* 1994; 19:1803-8.
9. Otani K, Arai I, Mao GP, Konno S, Olmarker K, Kikuchi S. Nucleus pulposus-induced nerve root injury: relationship between blood flow and motor nerve conduction velocity. *Neurosurgery.* 1999; 45:614-9.
10. Saal JA, Saal JS. Nonoperative treatment of herniated lumbar intervertebral disc with radiculopathy. An outcome study. *Spine.* 1989; 14:431-7.
11. Cowan NC, Bush K, Katz DE, Gishen P. The natural history of sciatica: a prospective radiological study. *Clin Radiol.* 1992; 46:7-12.
12. Macnab I. Negative disc exploration. An analysis of the causes of nerve-root involvement in sixty-eight patients. *J Bone Joint Surg Am.* 1971; 53:891-903.
13. Van Akkerveken PF. The diagnostic value of nerve root sheath infiltration. *Acta Orthop Scand Suppl.* 1993; 251:61-3.
14. Weiner BK, Fraser RD. Foraminal injection for lateral lumbar disc herniation. *J Bone Joint Surg.* 1997; 79-B:804-807.
15. Narozny M, Zanetti M, Boos N. Therapeutic efficacy of selective nerve root blocks in the treatment of lumbar radicular leg pain. *Swiss Med Wkly.* 2001; 131:75-80.
16. Riew KD, Yin Y, Gilula L, Bridwell KH, Lenke LG, Laurysen C *et al.* The effect of nerve-root injections on the need for operative treatment of lumbar radicular pain. *J Bone Joint Surg AM.* 2000; 82:1589-1593.
17. Riew KD, Park JB, Cho YS *et al.* Nerve root blocks in the treatment of lumbar radicular pain. A minimum Five year follow up. *J Bone Joint Surg Am.* 2006; 88(8):17225.
18. Zennaro H, Dousset V, Viaud B *et al.* Periganglionic foraminal steroid injections performed under CT control. *AJNR Am J Neuroradiol.* 1998; 19(2):34952.
19. Devulder J, Deene P, De Laat M, Van Bastelaere M, Brusselmans G, Rolly G. Nerve root sleeve injections in patients with failed back surgery syndrome: a comparison of three solutions. *Clin J Pain.* 1999; 15(2):1325.
20. Lutz GE, Vad VB, Wisneski RJ. Fluoroscopic transforaminal lumbar epidural steroids: An outcome study. *Arch Phys Med Rehabil.* 1998; 79:1362-1366.