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RESEARCH ARTICLE

CAUDAL BLOCK AS A TREATMENT MODALITY TO AVOID LUMBAR SPINE SURGERY IN PATIENTS WITH CHRONIC BACK PAIN

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Abstract

Introduction: Chronic Lower back pain is the most common cause of functional disability in an adult due to prolonged sitting, ageing society, obesity & sedentary lifestyle, the number of Chronic Lower back pain patients can be expected to increase in the coming decades. Caudal Pain Block is one of the procedures to avoid lumbar spine surgery in patients with chronic low back pain. Main aim of this study is to analyse weather the effect of caudal pain block can avoid lumbar spinal surgery in patients with chronic low back pain.

Aims And Objectives: To find out that weather the effect of caudal pain block can avoid lumbar spinal surgery in patients with chronic low back pain. To review the literature.

Material and Methods: A prospective study was done on 55 patients with chronic low back pain who were given caudal pain block and followed up at 1,2, 3, and 6 months and outcomes measured using visual analogue scale and The Roland–Morris Disability Questionnaire.

Observations: Caudal pain block was given in 55 patients, 51 patients got relieved of their pain and were able to avoid spine surgery and 4 out of 55 patients went for the spine surgery despite given caudal pain block.

Results: According to VAS score 12 patients had excellent results, 21 had good results, 18 had fair and 4 had poor results. According to Roland–Morris Disability Questionnaire - 10 patients had excellent results, 20 patients had good results, 21 had fair results and 4 had poor results.

Conclusion: Chronic low back pain managed with Caudal pain block is a good treatment modality with excellent results and good alternative to avoid operative procedures.

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Introduction:-

Chronic low back pain is the most frequent and persistent pain, with a lifetime prevalence of 65% to 80%. Around 13% of the population suffers with persistent low back pain of high intensity, with either moderate or severe disability. With the increasing prevalence of chronic persistent low back pain, numerous modalities of treatments applied to manage chronic low back pain are also exploding^[1]. In the United States, epidural injections are one of the most commonly utilized modalities of treatment in managing chronic low back pain and lower extremity pain, in addition to numerous other modalities including surgical interventions. Epidural injections are administered by accessing the lumbar epidural space by multiple routes including caudal, transforaminal, and interlaminar. While

significant differences have been described between these 3 approaches, with the caudal approach, multiple advantages include being target specific for a lower level, thus reaching the primary site of pathology also its ability to reach the ventrolateral epidural space in a significant proportion of patients.^[2]

Material And Methods:-

This Randomised clinical study was conducted at NSCB Medical College, Jabalpur from 1st Jan 2021 to 31st June 2022. Ethical committee approved this study. All patients were informed about the study and written consent taken.

Fluoroscopy-Guided Caudal Pain Block.

Because of the inaccuracy of blind technique, some authors have recommended that caudal epidural injection is performed under fluoroscopic guidance. The patient is usually placed in prone position for fluoroscopy-guided Caudal Pain Block.^[3]

In lateral view of fluoroscopy, the sacral hiatus could be identified as an abrupt drop off at the end of S4 lamina. The block needle trajectory can be visualized and navigated accordingly into the sacral canal. By injecting contrast medium under fluoroscopy, the placement of needle tip within the sacral epidural space can be verified, and intravascular or intrathecal needle tip placement can be detected.^[4] During caudal epidural injection, intravascular injection was reported in 3–14% of cases by conventional fluoroscopy even after negative aspiration. Fluoroscopy guidance has markedly improved the success rate of caudal epidural block and is now considered as the gold standard in performing caudal block. However, routine use of fluoroscopy for caudal epidural block is limited by radiation exposure, cost, and special space requirement.^[5]



Fluoroscopy-guided Caudal Pain Block. Proper needle tip placement was verified by observing spread of contrast medium within the epidural space without intravascular uptake. Arrows: needle.

Inclusion Criteria

1. Degenerative lumbar disease
2. Lumbar disc prolapse
3. Spinal stenosis

Exclusion Criteria

1. Tumors
2. Cauda equina syndrome
3. Infections.
4. Autoimmune diseases
5. Compression fractures
6. Sacroiliac joint dysfunction

Pre-injection Assessment of pain severity was done by using a visual analogue scale. Impact on functional status were assessed using The Roland–Morris Disability Questionnaire Score.

VAS score Activity

The visual analog scale is a linear line, the left end of the line indicates no pain and the end of the right, indicates worst pain. There are 4 categories. A. None (0) - no pain B. Mild (1-3) - occasional pain at work. C. Moderate (4-6) – continue pain during work. D. Severe (7-10) – severe pain causes discontinuation of the work but resumed after rest.

The patient was advised to put the finger on the line where the pain is in relation to the two extremities of the scale. For those who can't understand the pain scale, pain assessment was done by asking the part of one rupee

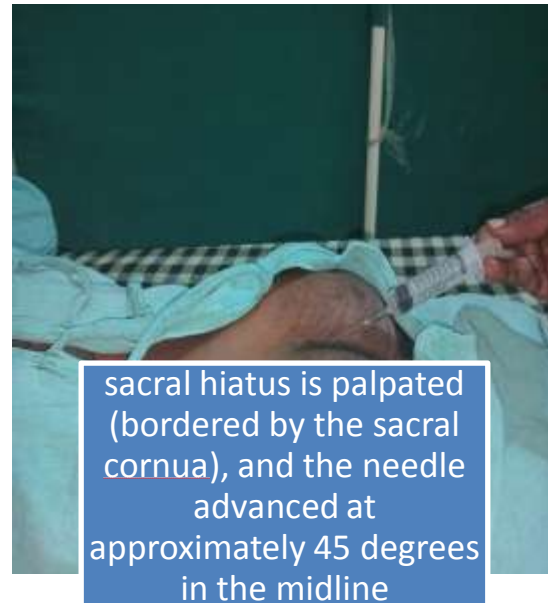
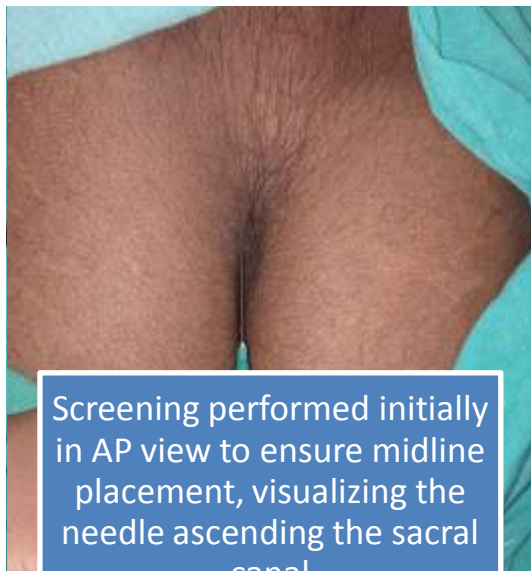
Roland–Morris Disability Questionnaire Score.

RMDQS is a clinical rating scale, that contains subjective clinical variables. The score on the RMDQS scoring scale ranges from 0 to 24, with a higher score indicating more impairment. No radiological factors were included in this score.

Procedure

Positioning/room set up

The patient is placed prone on the fluoroscopy table, and the lumbar region exposed down to mid-buttock. Using alcohol or iodine (or both) containing disinfectant skin preparation is done. Then exposed area is washed with betadine and sterillum and properly prepared with sterile drape.



Equipment

1. 21-gauge, 3.5 cm green colour needle
2. fenestrated or chuck-drapes, image intensifier
3. radio opaque dye such as Iohexol (2ml)
4. local anaesthetic, e.g., 2% lignocaine (4ml)
5. Triamcinolone 2ml (40mg/ml)
6. long-acting local anaesthetic, e.g., 0.5% bupivacaine (3ml)
7. Distilled water (21ml)

Technique

The sacral hiatus is palpated (bordered by the sacral cornua), and the needle advanced at approximately 45 degree in the midline. Screening should be performed initially in AP projection to ensure midline placement and then in lateral

projection for visualizing the needle ascending the sacral canal.^[6] Lateral screening can be used to plan both skin entry and degree of needle angulation.

The tip of the needle should be advanced no further than S3 to avoid the risk of Dural puncture. A pop can sometimes be felt as the needle passes through the sacrococcygeal ligament and into the hiatus.^[7]

Once reached, 1-2 mL of contrast is injected, confirming extradural and extravascular location, and acting as a visual marker for the ascent of steroid / local anaesthetic. The cocktail of therapeutic mixture is then injected consisting of 3 injections which are sequentially injected.^[8]

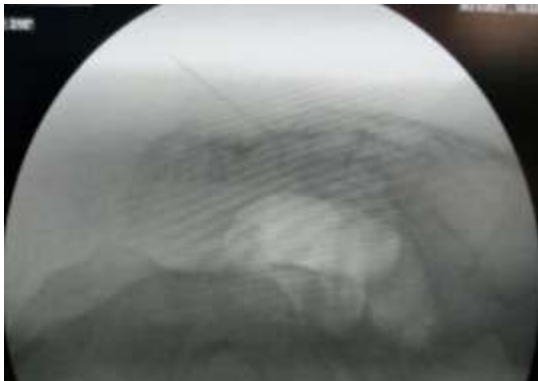
1ST injection containing 3ml 0.5% bupivacaine + 4ml 2% lignocaine + 3ml distilled water

2ND injection containing 2ml triamcinolone + 8ml distilled water

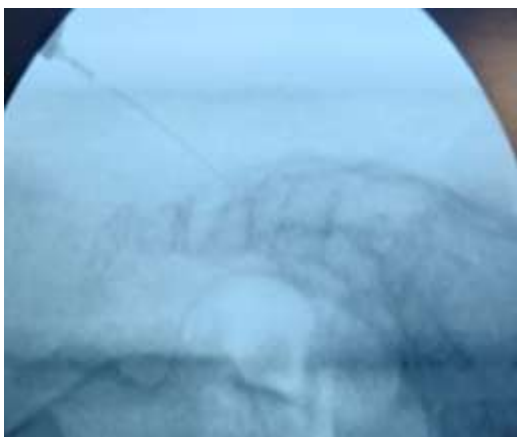
3RD injection containing 10ml distilled water



- 1-2 mL of contrast is injected, confirming extradural and extravascular location, and acting as a visual marker for the ascent of steroid / local anaesthetic



- **Cocktail of therapeutic mixture** is then injected consisting of 3 injections which are sequentially injected.



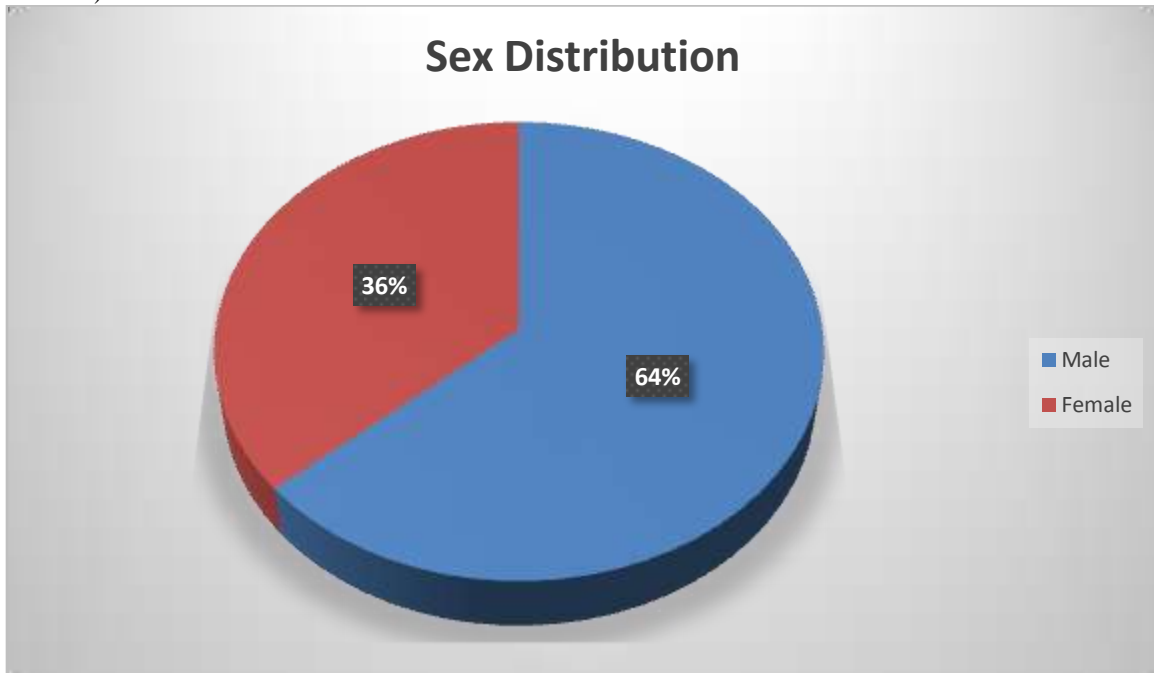
- **1ST injection** containing 3ml 0.5% bupivacaine + 4ml 2% lignocaine + 3ml distilled water
- **2ND injection** containing 2ml triamcinolone + 8ml distilled water
- **3RD injection** containing 10ml distilled water

Statistical Analysis

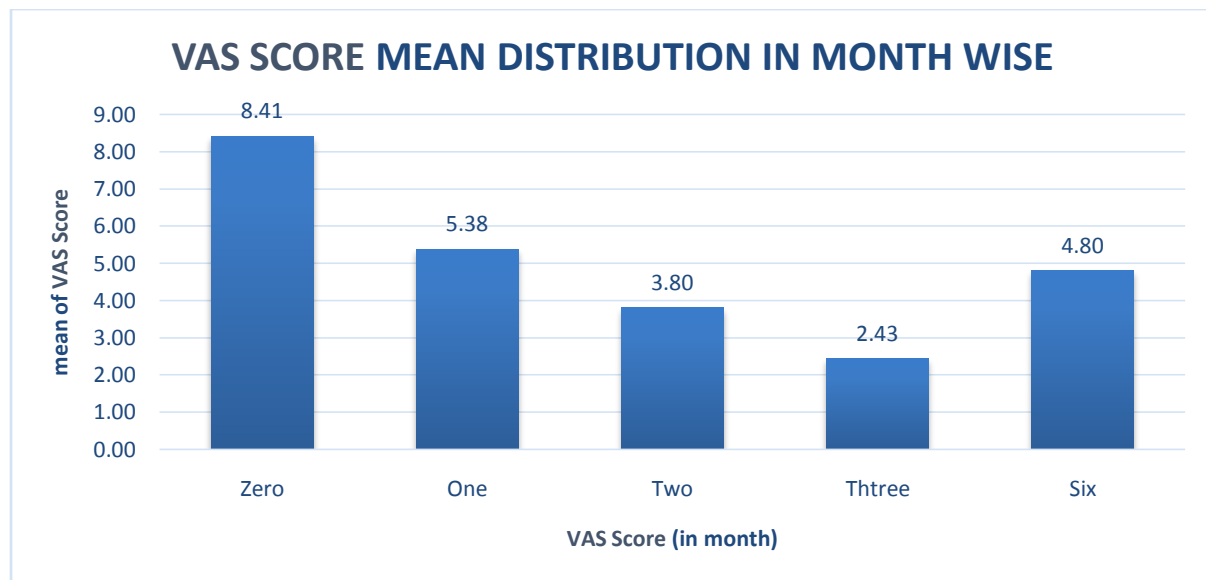
After the collection of data, SPSS version 23.0 was used for statistics. Chi-square test was done for the demographic variable and the results between the two comparison groups. Independent student t-test was done between the two comparison groups. P-value was calculated for all variables and showed as <.001 for significant.

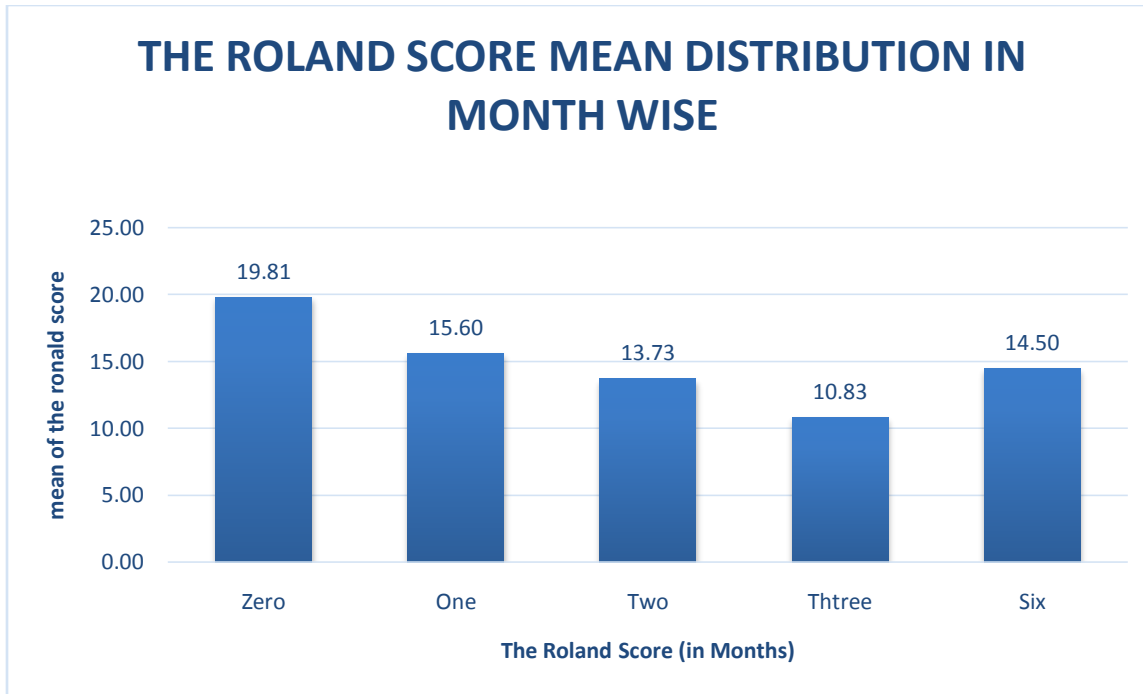
Result:-

In this study conducted, the patients presented with age group ranging from 30 to 75 years of age (mean \pm SD age of 51.07 ± 7.95) with sex distribution of 63.6% male and 36.4% female.



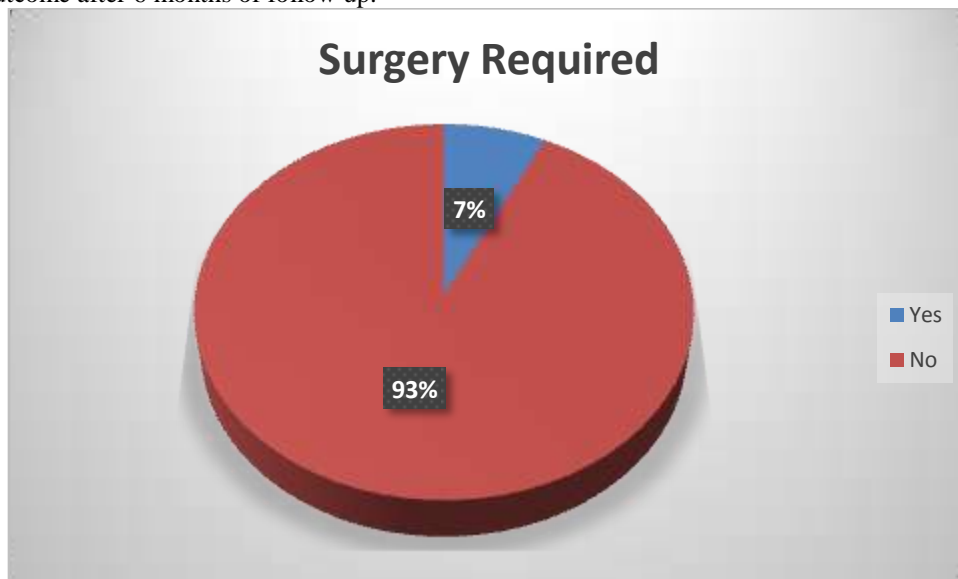
The mean VAS score and mean RMDQS score of both groups shows no significant difference before treatment ($p > .05$). After treatment both the groups shows improvement in mean VAS score and mean RMDQS score up to 6 months of follow-up. At the end of 6 months, the follow-up mean VAS score with SD was 4.80 ± 1.14 and mean RMDQS score with SD was 14.50 ± 1.45 of the treating group was low as compared with the mean VAS score with SD was 8.41 ± 0.62 and mean RMDQS score with SD was 19.81 ± 1.24 before treatment.





With the post injection VAS score after 6 months of caudal epidural block for 12 patients had excellent results, 21 had good results, 18 had fair and 4 had poor results. According to Roland–Morris Disability Questionnaire score - 10 patients had excellent results, 20 patients had good results, 21 had fair results and 4 had poor results.

Out of 55 patients, 4 patients (7.28%) who had poor results in vas score at the end of 6 months of follow upwent for the surgical management (laminectomy), rest 51 patients (92.72%) were symptomatically better and had good functional outcome after 6 months of follow up.



Discussion:-

In order to assess the effectiveness of epidural steroid injections for the treatment of chronic low back pain, we must first recognize the natural history of the disorder. Hakelius et al described a favourable prognosis for patients with sciatica, and after treating a group of patients with bed rest and brace, 70% were clinically improved in 3 months’ time however, in our study we did not recognise the bed rest and brace as a treatment modality in chronic back pain

and only considered caudal epidural steroid injection as a conservative treatment modality.^[9] This study lacks the rigorous evaluation criteria used in modern clinical trials, but gives us a broad idea that not all patients require surgery to obtain relief of their symptoms within a reasonable timeframe.^[10]

An epidural injection can decrease inflammation in the epidural space and can decrease pain in the affected nerve root. William e. Ackerman et al concluded that transforaminal route of epidural steroid injection is more effective than caudal and interlaminar route in response to pain relief however Our study lacks comparison in using different approaches for epidural steroid injection for better analgesic efficacy. The lack of functional efficacy noted in the study conducted by William e. Ackerman et al may be related to the fact that he did not have a normal baseline function evaluation that he could compare with the abnormal function prior to the patient's disk herniation, this abnormality is also included in our study as we also did not had data regarding the normal baseline function of the patient prior to the pathology^(11,12,13). These data would have been helpful in making a statistical comparison. However, A Conn et al in his study stated that the caudal epidural injections were effective and there may not be any significant difference with the addition of steroids, however in our study all the patients were given both local anaesthetic such as lignocaine and bupivacaine as well as steroid injection such as triamcinolone so we could not assess the difference with or without epidural steroid injection.^[14,15] In the study conducted by William e. Ackerman et al for the Caudal route, there may be an increased risk of needle tip placement anterior to the sacrum or into the rectum however, no such complication was noted in our study^[16,17]. William e. Ackerman et al concluded that the chance of puncturing the dura may be less with the Caudal method.^[18] He also concluded that the Transforaminal method carries a risk of trauma to the nerve root during needle placement.^[19,20] This method also includes the risk of paraplegia if an inadvertent, intraarterial injection of particulate steroid is injected into a radicular artery that reinforces the blood supply of the lower end of the spinal cord, in our study no such approach was used, all the epidural steroid injection that were given was through caudal approach.^[21,22,23]

The current study was designed to assess the relative effectiveness of caudal epidural steroid injections, performed with a standardized technique. Conservative management successfully provided relief from the major complaint of pain to a significant proportion of patients (51 patients out of 55 patients). A comparable number of patients elected to have surgery (4 patients out of 55 patients) after the index procedure was considered to have failed. Most of the patients that elected to have surgery did so within 3 to 6 months of treatment. Treatment was considered successful by all other patients, and this was quantified by significant changes in VAS and RMDQ scores. As described in other clinical trials, a decline in VAS to 50% of baseline, as well as a decrease in RMDQ of at least 5 points is considered as a standard of clinically relevant difference. These goals were obtained for the patients that were treated with caudal epidural block.

Conclusion:-

The effectiveness of caudal epidural steroid injections for the treatment of chronic low back pain were compared. They were found to be equivalent, and allowed patients to avoid surgery in approximately 93% of the cases. Regardless of the efficacy of caudal block, 7% of the patients required surgical management for their chronic low back pain, rest all the remaining patients were satisfied with the relief in pain and return to functional capacity.

Thus, Chronic low back pain managed with Caudal pain block is a good treatment modality with excellent result and good alternative to avoid operative procedures.

Bibliography:-

1. B. Dalens and A. Hasnaoui, "Caudal anesthesia in pediatric surgery: success rate and adverse effects in 750 consecutive patients," *Anesthesia and Analgesia*, vol. 68, no. 2, pp. 83–89, 1989.
2. R. M. Orme and S. J. Berg, "The 'swoosh' test—an evaluation of a modified 'whoosh' test in children," *British Journal of Anaesthesia*, vol. 90, pp. 62–65, 2003.
3. D. L. Renfrew, T. E. Moore, M. H. Kathol, G. Y. El-Khoury, J. H. Lemke, and C. W. Walker, "Correct placement of epidural steroid injections: fluoroscopic guidance and contrast administration," *American Journal of Neuroradiology*, vol. 12, no. 5, pp. 1003–1007, 1991.
4. M. Y. Stitz and H. M. Sommer, "Accuracy of blind versus fluoroscopically guided caudal epidural injection," *Spine*, vol. 24, no. 13, pp. 1371–1376, 1999.
5. G. Barham and A. Hilton, "Caudal epidurals: the accuracy of blind needle placement and the value of a confirmatory 5 epidurogram," *European Spine Journal*, vol. 19, no. 9, pp. 1479–1483, 2010.

6. M. Sekiguchi, S. Yabuki, K. Satoh, and S. Kikuchi, "An anatomic study of the sacral hiatus: a basis for successful caudal epidural block," *Clinical Journal of Pain*, vol. 20, no. 1, pp. 51–54, 2004.
7. A. Aggarwal, A. Aggarwal, Harjeet, and D. Sahni, "Morphometry of sacral hiatus and its clinical relevance in caudal epidural block," *Surgical and Radiologic Anatomy*, vol. 31, no. 10, pp. 793– 800, 2009.
8. A. Aggarwal, H. Kaur, Y. K. Batra, A. K. Aggarwal, S. Rajeev, and D. Sahni, "Anatomic consideration of caudal epidural space: A Cadaver Study," *Clinical Anatomy*, vol. 22, no. 6, pp. 730–737, 2009
9. Atlas SJ, Keller RB, Chang YC, et al. Surgical and non-surgical management of sciatica secondary to a lumbar disc herniation. *Spine* 2001;26(10):1179- 1187.
10. Atlas SJ, Deyo RA, Keller RB, et al. The maine lumbar spine study, Part II: 1-year outcomes of surgical and nonsurgical management of sciatica. *Spine* 1996;21(5): 1777-1786.
11. Atlas SJ, Keller RB, Wu YA, et al. Long-term outcomes of surgical and nonsurgical management of sciatica secondary to a lumbar disc herniation: 10 Year results from the maine lumbar spine study. *Spine* 2005;30(8): 927-935.
12. Butterman GR. Treatment of lumbar disc herniation: Epidural steroid injection compared with discectomy. *J Bone and Joint Surg* 2004; 86A(4): 670-679.
13. Cuckler JM, Bernini PA, Wiesel SW, et al. The use of epidural steroids in the treatment of radicular pain. *J Bone and Joint Surg* 1985; 67:63-66.
14. Delpont EG, Cucuzella AR, Marley JK, et al. Treatment of lumbar spinal stenosis with epidural steroid injections: a retrospective outcome study. *Arch Phys Med Rehabil* 2004; 85:479-484.
15. Hagen KB, Hilde G, Jamtvet G, et al. The cochrane review of advice to stay active as a single treatment for low back pain and sciatica. *Spine* 2002; 27:1736-1741.
16. Koes BW, Scholten RJ, Mens JM, Bouter LM. Efficacy of epidural steroid injections for low-back pain and sciatica: a systematic review of randomized clinical trials. *Pain* 1995;63:279 – 88.
17. Kepes ER, Duncalf D. Treatment of backache with spinal injections of local anesthetics, spinal and systemic steroids. A review. *Pain* 1985;22:33– 47.
18. Bush K, Hillier S. A controlled study of caudal epidural injections of triamcinolone plus procaine for the management of intractable sciatica. *Spine* 1991;16:572–5.
19. Carette S, Leclaire R, Marcoux S, et al. Epidural corticosteroid injections for sciatica due to herniated nucleus pulposus. *N Engl J Med* 1997;336:1634 – 40.
20. Vad VB, Bhat AL, Lutz GE, Cammisa F. Transforaminal epidural steroid injections in lumbosacral radiculopathy: a prospective randomized study. *Spine* 2002;27:11–16.
21. Ridley MG, Kingsley GH, Gibson T, Grahame R. Outpatient lumbar epidural corticosteroid injection in the management of sciatica. *Br J Rheumatol* 1988;27:295–9.
22. Snoek W, Weber H, Jorgensen B. Double blind evaluation of extradural methyl prednisolone for herniated lumbar discs. *Acta OrthopScand* 1977;48:635– 41.
23. Coomes EN. A comparison between epidural anaesthesia and bed rest in sciatica. *BMJ* 1961;5218:20 – 4.