Transforaminal Epidural Neuroplasty for Chronic Low Back Pain due to Spinal Canal Stenosis

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ABSTRACT

People all over the world suffer from persistent low back pain, often caused by spinal canal stenosis. In long term cases of spinal canal stenosis, perineural adhesions can form and that further exacerbates the pain. Transforaminal epidural adhesiolysis is beneficial as it breaks down the adhesions and allows more precise delivery of drug to the targeted area. We present a case of 57 years lady with complaint of low back pain for 2 years radiating to left leg and associated with heaviness of left leg after walking for 5 minutes. MRI report and her clinical features were suggestive of canal stenosis at L4 and L5 level. Percutaneous epidural neuroplasty was done using Racz catheter via transforaminal subpedicular approach at L4-L5 level. The numeric pain rating scale before procedure was 7/10 and after procedure decreased to 3/10. Her walking distance also increased to 45 minutes in 1 month after the procedure.

INTRODUCTION

Globally, the most prevalent cause of musculoskeletal discomfort is low back pain. One of the causes of persistent and refractory low back pain is spinal canal stenosis. It is characterized by narrowing of anteroposterior diameter of central canal, lateral recess and neural foramina leading to compression of neurovascular structures. It is associated with features of neurogenic claudication and radicular leg pain. Pain worsens on prolonged standing and walking thereby hampering the daily quality of life. Additionally, in chronic recurrent cases, there is also development of perineural adhesions that further increases the pain. There are various conservative treatment modalities like anticonvulsants, anti-inflammatory drugs and physical exercise. Transforaminal epidural injection is commonly used for nonsurgical management. But, its benefits are limited and duration of pain relief is short lived due to presence of perineural adhesions. Transforaminal epidural adhesiolysis is more advantageous as the adhesions are chemically and mechanically disrupted and the drug is more accurately delivered near the inflamed nerve roots. Here, we present a case of spinal canal stenosis managed with transforaminal epidural adhesiolysis using Racz catheter.

Case presentation

57 years lady presented with complaint of low back pain for 2 years aggravated since 2 months. Pain was dull aching type radiating to left leg, associated with heaviness of left leg after walking for 5 minutes. Pain subsided on rest and sitting. The numeric pain rating scale was 7/10. She was under
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Tab Pregabalin for 1 year but pain was not relieved. There was no history of trauma or morning stiffness. On examination, she was bending on right side, pain was present on left lateral bending, Kemp and stoop test were positive. Straight leg rising test positive at 60 degrees on left side. There was no sensory and motor deficits. MRI showed Grade I anterolisthesis of L4 over L5, moderate compression in central canal, left lateral recess and neural foramina at L4 and L5 level.

She was planned for percutaneous epidural neuroplasty. Informed written consent was taken prior to the procedure. The procedure was performed in operation theatre with ASA standard monitoring and fluoroscopy. Routine and emergency drugs were also prepared. 20 Gauze IV cannula was opened and Inj Ceftriaxone 1 gm was given intravenously before the procedure. The patient was made to lie in prone position. C-arm fluoroscope was used to identify the needle insertion point. Under all aseptic conditions, skin was infiltrated with 3 ml of Inj. Lignocaine 1% (preservative free). 16 Gauze RX Coudé® needle was used and inserted until the needle tip reached within the left L4-L5 neural foramen below the left L4 pedicle. Then Racz catheter was inserted into the epidural space through the needle. The location of needle in epidural space was confirmed after injection of soluble contrast media (Iohexol). Inj Hyaluronidase 1500 units in 10 ml normal saline was injected. Then mechanical adhesiolysis was done using Racz catheter. Dye was intermittently given. Adhesiolysis was done until the filling defects were well filled by dye. The tip of catheter at the end reached upto the anterior epidural space. Then, 3 ml Inj. Lignocaine 2% (preservative free) with 40 mg Methylprednisolone with 4 ml normal saline total volume 8 ml was given. Then, flushed with 8 ml normal saline and catheter was removed. Patient was monitored for 2 hours postoperatively. The numeric pain rating scale after procedure was 3/10. She was also advised to reduce weight and do regular physical exercises for quick recovery. At 1 month follow up after the procedure, on verbal pain rating scale, her pain was reduced by 70 percent and numeric pain rating scale was 3/10. Her walking distance also increased to 45 minutes.

**DISCUSSION**

Spinal canal stenosis is a common cause of chronic low back pain afflicting many people in the world. The narrowing of spinal canal compresses the blood vessels and nerve roots and most commonly present with neurogenic claudication and radicular pain. Initially, it is managed with drugs, exercises and epidural steroids. The presence of perineural fibrosis renders epidural steroids less effective. Epidural neuroplasty using Racz catheter has shown superior effects in providing long term pain relief in patients with spinal canal stenosis. Epidural neuroplasty can be done by various approaches. Transforaminal approach is a targeted procedure that delivers drug directly near the inflamed nerve roots. The drugs used in epidural neuroplasty have wide range of potential advantages. Hyaluronidase hydrolyses the hyaluronic acid present in connective and fibrous tissue and allows better spread of drug. It also suppresses the inflammatory response. The steroids also exhibit anti-inflammatory effects. Local anesthetics inhibit action potential and reduces nociceptive discharges. 10% hypertonic saline reduces edema and has neurolytic effects on nociceptive C fibres. 0.9% normal saline washes away the inflammatory debris. However, various complications like bending of the needle, shearing of the catheter, misplacement...
of the catheter, inadvertent blockage of catheter tip, catheter migration, hypotension, respiratory depression, bowel and bladder incontinence, paresthesia, epidural abscess and meningitis can also occur following the procedure.

In a study by Park Y et al., they had compared the efficacy of percutaneous adhesiolysis and transforaminal epidural steroid injection for treatment of chronic radicular pain caused by lumbar foraminal spinal stenosis. They found reduction of pain by 73.3% by verbal pain rating scale at 12 week follow up in percutaneous adhesiolysis group while only 43.3% reduction in transforaminal epidural steroid group. The result is similar to our case.

A study by Aoi I et al., also found significant reduction in postoperative numeric pain rating score in patients who underwent percutaneous adhesiolysis for chronic back pain and radicular leg pain. The mean numeric pain rating score reduced from 7.69 to 3.92 at 3 months after the procedure similar to our case report.

Manchikanti L et al, found pain decreased by more than 50% in 76% of participants at 1 year follow up after the procedure as compared to 4% of participants who received caudal steroid only without adhesiolysis.

In another study by Manchikanti L et al, they had compared three groups, epidural local anesthetics and steroids without adhesiolysis, adhesiolysis with normal saline and local anesthetics and adhesiolysis with local anesthetics, steroids and hypertonic saline. They found similar results with adhesiolysis with or without hypertonic saline. Also in our case, 0.9% normal saline was used and the pain was found to significantly reduce by 70% at 1 month follow up. The normal saline is also equally effective as it flushes out the inflammatory debris from the pathological site.

Similarly, studies by Dağıstan G et al., Akcakaya M et al. also showed favorable results with percutaneous epidural neuroplasty in treatment of refractory low back pain and leg pain following spinal canal stenosis.

CONCLUSION

Hence, transforaminal epidural neuroplasty can effectively reduce chronic low back pain with radicular leg pain due to spinal canal stenosis.

REFERENCES


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