

Epidural Steroid Injection For Post Laminectomy Syndrome: Transforaminal Versus Caudal

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Citation

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Abstract

Objective: To compare transforaminal epidural injection with caudal injection for patients with post laminectomy syndrome.

Design: Prospective, cross-over, descriptive study

Setting: Outpatient surgery center

Patients: The patients with postlaminectomy syndrome were included in the study.

Interventions: All patients initially received caudal epidural steroid injection after evaluation. Two weeks later, if patient had significant pain relief from caudal injection, then caudal epidural steroid injection was repeated. If patient had no significant pain relief from caudal injection, then transforaminal epidural injection was performed. A quality of pain relief of 50% or greater was considered as significant.

Results: There were total 12 patients in the study. Three patients had significant pain relief from caudal epidural injection. Eight patients had 50% pain relief from transforaminal epidural injection. The difference in pain relief effect between transforaminal epidural injection and caudal epidural injection was statistically significant.

Conclusion: Transforaminal epidural steroid injections had better pain relief for post laminectomy syndrome patients than caudal epidural injection.

INTRODUCTION

Pain treatment for post laminectomy syndrome patients is a challenge. Epidural steroid injection is a well accepted therapeutic modality used in the management of lumbar radicular pain. Interlaminar, transforaminal, and caudal approach had been widely applied for post laminectomy syndrome patients. The most common approaches in postlaminectomy patients are transforaminal and caudal. It is unknown whether different injection techniques have different outcome. We performed this observations and cross-over study to compare transforaminal epidural injection with caudal injection for patients with post laminectomy syndrome.

METHODS

The patients with recurrent low back pain after having had one or two lumbar laminectomies and having diagnosed by

either neurosurgeon or an orthopedic surgeon as having postlaminectomy syndrome were included in the study. The pain duration was at least 6 months, the pain intensity (VAS) was > 7 , and the pain was unilateral radicular pain. The pain did not response to physical therapy, antiinflammatories, or analgesics.

All epidural injections were performed at an ambulatory surgery center by one anesthesiologist. All patients initially received caudal epidural steroid injection after evaluation. Two weeks later, patient was reevaluated. If patient had significant pain relief from caudal injection, then caudal epidural steroid injection was repeated. If patient had no significant pain relief from caudal injection, then transforaminal epidural injection was performed.

Caudal epidural injection technique: a 22-gauge 10-cm

spinal needle was radiographically guided to the caudal spinal canal. The needle position was verified by contrast spread into the caudal spinal canal. Then 80 mg triamcinolone with 10 mg lidocaine (15ml in total) was injected into the caudal spinal canal.

Transforaminal epidural injection technique: a 25-gauge 10-cm spinal needle was radiographically guided into the so-called "safe-triangle."² The safe triangle is composed of a root made of by the pedicle, a tangential base that corresponds to the existing nerve root, and lateral border of the vertebral body. Both AP and lateral fluoroscopic views confirmed proper needle placement. With the lateral view, the needle was positioned just below the pedicle along the ventral aspect of the intervertebral foramen. With the AP view, the needle was placed just beneath the midportion of the corresponding pedicle.³ Once an epidurogram was obtained, 40 mg triamcinolone with 10 mg lidocaine (2ml in total) was injected into the epidural space.

A quality of pain relief of 50% or greater was considered as significant. Data was analyzed with Fisher's exact test. A P value of < 0.05 was considered significant.

RESULTS

There were total 12 patients in the study. Three patients had significant pain relief from caudal epidural injection. Eight patients had no pain relief from initial caudal epidural injection; however, they subsequently had 50% pain relief from transforaminal epidural injection. One patient had no relief from either caudal or transforaminal epidural injections. The difference in pain relief effect between transforaminal epidural injection and caudal epidural injection was statistically significant (8/1 vs. 3/9) ($P < 0.05$).

DISCUSSION

The postlaminectomy syndrome has been applied to patients with unrelieved pain following lumbar spine surgery. The possible pathological changes may be present in patients with post laminectomy syndrome. These changes include inflammation, edema, fibrosis, venous congestion, mechanical pressure on the posterior longitudinal ligament, reduced or absent nutrient delivery to the spinal nerve or nerve root, and central sensitization.⁴ The treatments of postlaminectomy syndrome include physical therapy, minor nerve blocks, transcutaneous electrical nerve stimulation, behavioral medicine, nonsteroidal anti-inflammatory medications, membrane stabilizers, antidepressants, spinal cord stimulation, and intrathecal morphine pump.⁴

Use of epidural steroid injections has been shown to decrease the frequency and intensity of the pain.⁵

Translaminar and caudal epidural injection routes are dorsal, and corticosteroid spread to the ventral target site occurs by diffusion.⁶ The dorsal median epidural septum may confine the spread of dorsal epidural flow to the side ipsilateral to the injection. ⁶Therefore, it seems improbable that an adequate concentration of corticosteroid could be delivered to the target tissues by caudal or translaminar approaches.⁷ The transforaminal technique allows a high concentration of corticosteroid to be delivered precisely to the target site. Our study indicated that transforaminal epidural injection had better pain relief for those patients who had no relief from the caudal injection. High concentration of steroid in the target site accounts for the result.

Our study has not long term followup results. However, epidural injection should not be the solo therapy for patients with postlaminectomy syndrome. The ultimate goal of the epidural steroid injections is to provide relief so that psychology, physical therapy, and pharmacologic management can be maximized to lead behavioral changes.⁴ Long term pain relief depends on multifactor. Long term followup results may not reflect the efficacy of epidural injection.

Our patients initially received caudal epidural steroid injection. Green et al. demonstrated that patients who had relief of pain after epidural steroid injections, improvement was noted in 2 days or less in 37% and in 4 to 6 days in 63%.⁸ Therefore, the possibility of caudal injection enhancing the following transforaminal epidural injection is very small.

A retrospective study had shown that 50% of failed back surgery syndrome patients had more than 50% pain relief after transforaminal epidural injection. ⁹ Kim et al. demonstrated that 34% of postlaminectomy syndrome patients had 50% pain relief as result of caudal epidural steroid injection.¹⁰ However, there are no prospective comparisons between caudal and transforaminal injection techniques in postlaminectomy syndrome patient population. Our study compared the efficacy of caudal injection and transforaminal epidural injection. However, our study was prospective, cross-over, observation study. Our patient population is small. A future randomized, double-blinded, placebo-controlled, large patient population study is necessary.

In conclusion: Transforaminal epidural steroid injections had

better short term pain relief in the management of post laminectomy syndrome patients than caudal epidural injection.

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