

# Cervical Epidural Injection for Chronic Pain Relief

Literature review & A Clinical Audit done at West Hertfordshire NHS Trust Hospitals

Dr Khadija E Qureshi (**Specialist Doctor**) Dr Paul Hart (**Clinical Director & Consultant Pain Medicine**)

## INTRODUCTION

Epidural steroid injections (ESIs) are a frequently used treatment for chronic pain syndromes. A common characteristic among the syndromes treated with ESI is a pain described as “radicular pain”. The word radicular means “root” and typically refers to an irritated nerve root “Radiculitis”, or weakness associated with an affected nerve root, “Radiculopathy”

Dogliotti in 1933 was the first to describe cervical epidural anesthesia<sup>1</sup>. Bonica et al described a series of cases in which cervical epidural anaesthesia was used for surgery of the upper extremities, particularly in those cases where bilateral involvement with multiple fractures of the arm or shoulder girdle was present<sup>2</sup>.

Epidural Steroid Injections are considered routine and relatively painless. Approximately 72% of patients experienced immediate pain relief in a 2007 research trial to evaluate the usefulness of a cervical interlaminar epidural steroid injection in patients with neck pain and cervical radiculopathy (Kwon 2007). If pain relief is only moderately achieved with the first injection then another injection can be given in 2 weeks and may provide additional relief. Conditions commonly treated with ESI are Degenerative Disc Disease (Botwin 2007), Spinal stenosis, Spondylolysis, Radiculitis, Radiculopathy and Herniated Discs (Lin 2006).

**Procedure:** The procedure involves injecting a medication into the epidural space, where irritated nerve roots are located. This injection includes both a long-lasting steroid and a local anaesthetic (lidocaine or bupivacaine)

The steroid reduces the inflammation and irritation and the anaesthetic works to interrupt the pain-spasm cycle and nociceptor (pain signal) transmission (Boswell 2007). The combination medicine then spreads to other levels and portions of the spine, reducing inflammation and irritation. The entire procedure usually takes less than fifteen minutes. The most important and greatest success achieved with the use of epidural steroid injections (ESI) is the rapid relief of symptoms that allows patients to experience enough relief to become active again. With this help patients regain the ability to resume their normal daily activities.

**Types of ESI:** There are 2 basic methods of performing cervical epidural steroid injections under fluoroscopy, an x-ray like process that helps the doctor guide the needle, these are transforaminal and Interlaminar (Fig. 1)

The main difference in the types of ESIs is the position where the needle is inserted as well as the amount of nerve roots treated. After reviewing the history, performing a physical exam, and determining the cause of pain, the trained pain specialist will decide which procedure is more beneficial for the patient.

**Transforaminal route:** This technique enters the epidural area from the side where the nerves come out. The transforaminal approach allows more targeted placement of the medications. Contrast dye is used to verify that the needle is in the correct position.

**Interlaminar route:** This is performed for relief of pain going from the neck to the shoulder, arm or hand and may be done from the back of the neck or the side of the neck. A combination of numbing medicine and anti-inflammatory steroid medication is injected into the epidural space to decrease the inflammation around the nerve root to the arm and hand that is causing pain.

### Indications

Acute disc injury, with or without radiculopathy  
Cervical spondylosis with acute disc disruption and radiculopathy

Post-laminectomy cervical pain

Cervical pain without specific anatomic etiology :

- Cervical strain syndromes with associated myofascial pain
- Reflex sympathetic dystrophy
- Post-herpetic neuralgia
- Acute viral brachial plexitis
- Muscle contraction headaches

### Contraindications

- Infection at the injection site
- Systemic infection
- Bleeding diathesis
- Uncontrolled diabetes mellitus
- Congestive heart failure

**Limitations of the technique:** The technical skill required, patient acceptance and training in cervical

epidural anaesthesia are the main limitations of this technique.

**Complications**

- Vasovagal reaction
- Dural puncture, postdural puncture (positional) headaches
- Headache without dural puncture
- Epidural abscess
- Epidural hematoma
- Durocutaneous fistula
- Spinal cord or brain stem injury from intra-arterial injection (transforaminal injections)
- Cushing's syndrome
- Non-positional headaches
- Facial flushing
- Insomnia
- Low-grade fever
- Neural injury from either catheter or needle
- Diaphragmatic paralysis are the known complications of this technique

**Aims of Audit**

1. To assess the effectiveness of Cervical Epidural injection in relieving chronic pain
2. To know the incidence of complications

**Methodology:** The Audit was registered with the Audit Department at West Hertfordshire NHS Trust Hospitals. Cervical epidural injection was performed for the relief of chronic pain, under mild sedation with midazolam (2 mg I/V). Attention to detail in positioning of the patient is given. The patient is placed in the prone position with a pillow under the neck and proper support for the head. Firm support pads are placed under the patient's chest and forehead, elevating the face off the table. (Fig 3). Standard sterile preparation and drape were followed by anaesthesia of the skin and subcutaneous tissues with 1% lidocaine. Needle placement was confirmed by image intensifier, and injection of radio-opaque dye in all patients. For an average-sized adult triamcinolone 80 mg was instilled. An additional 3 ml of 0.25% preservative-free bupivacaine was added. After the injection, the overlying puncture site was cleansed with alcohol wipe, and an adhesive bandage was placed. All the injections were performed by consultant pain medicine. Post procedure care involved monitoring the recovery for 30-60 minutes, patient complete pain scale assessment and an instruction to avoid exertional activities day of procedure.

For data collection a retrospective review of the clinic letters, written at first follow up after 23 consecutive epidurals between April 2006 and June 2007 was done. We reviewed patient profile and

assessed the epidural effectiveness and the incidence of complications.

**Inclusion Criteria:** All the Cervical epidural injections performed for the chronic pain relief during the above mentioned time period were included.

**Exclusion criteria:** The patients who did not attend for the follow up after their first cervical epidural injection were excluded

**Grading of Epidural Effectiveness:** The success of the epidural was rated on the self-evaluation by the patient. Depending on the degree of pain relief we graded the effectivity as follows:

- Absolute pain relief: 4/4
- Significant pain relief: 2/4
- Minor pain relief: 1/4
- No pain relief: 0/4

**Patients Profile / Approach:** A total of 20 cases were performed in this time period, 7/20 (35%) were males and 13/20 (65%) were females.

**Approach for Cervical Epidural:** The injection was performed in prone position and patients were given mild sedation

**RESULTS**

**1 Effectiveness for chronic pain relief:**

**Absolute pain relief (4/4):**

- 25% of the patients (5/20) had absolute relief of their symptoms after the first injection
- An additional 10%(2/20) of the patients had absolute relief after the repeat injection

**Significant relief (2/4):**

- 40% of the patients (8/20) had a significant relief of their symptoms after the injection
- Range of activities done by the patient increased

**Minor pain relief: (1/4)**

- 5%(1/20) of the patients had a minor pain relief after the injection

**No pain relief: (0/4)**

- 20% (4/20) of the patients had no benefit from the injection even after a repeat injection (for some).
- These patients were referred for the surgical intervention

Degree of Pain relief	%
Absolute pain relief (4/4) after first inj	25% (5/20)
Absolute pain relief (4/4) after repeat inj	10%(2/20)
Significant relief (2/4):	40% (8/20)
Minor pain relief:	5%(1/20)
No pain relief	20%(4/20)

**2. Incidence of Complications**

Out of 20 (5%) of the patient had a minor complication. Oral thrush and laryngitis was reported by this patient at first follow up clinic after injection

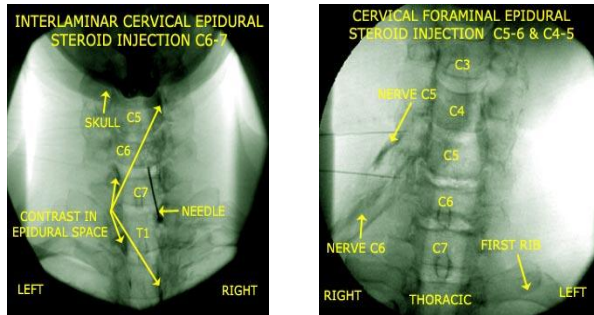


Fig: 1 Routes for Cervical Epidural Inj



Table 4: Degree of Pain relief after cervical epidural injection.



Fig 2: Cervical epidural injection patient position

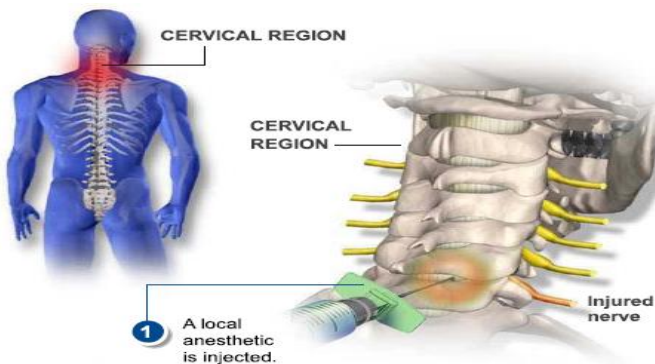


Fig 3: Steps of performing Cervical Epidural injection

**DISCUSSION**

Epidural Injections can be a very helpful adjunct in rehabilitation of patient's the spine pain that radiates into an arm or leg or in the thoracic spine around the chest or trunk. They work by placing steroids (a potent anti-inflammatory medication) close to an inflamed nerve. This allows the patient to be fully able to regain full motion and increase the muscular support of the spine critical in the recovery and prevention of future episodes. They are generally not indicated in spine pain that does NOT radiate from an irritated spinal nerve. Most patients actually respond to just 1-2 injections; therefore, they should not be routinely performed in a "series of three".

The injection can be performed in either sitting or prone position. It is certainly prudent to avoid the sitting position in a patient prone to vasovagal episodes. However, the lateral or prone positions do not enhance midline identification nor do they widen the cervical epidural space, as does the sitting position.

The long-term results of a single cervical epidural interlaminar corticosteroid injection are reported in one prospective non-comparative study as a success rate of 79%<sup>3</sup>.

The transforaminal route has gained in popularity over the last decade because it delivers the drug as close as possible to the inflammatory nerve root. Recently several case reports indicate the possibility of serious adverse events such as spinal cord injury after cervical transforaminal injections, which are hypothesized to be related to intra-arterial injection of particulate steroid occluding critical vessels that supply the spinal cord<sup>4</sup>.

In a retrospective cohort study on the complications of fluoroscopic guided interlaminar cervical epidural injections only minor complications were mentioned (in 17% of the patients). These complications resolved without morbidity<sup>5</sup>.

In this Clinical Audit all the cervical epidural injections were performed through interlaminar route in prone position under fluoroscopic guidance. Only 5% patients reported minor complications (oral thrush and laryngitis) which resolved spontaneously. Those patients who had no benefit from the injection (20%) even after a repeat injection (for some) were referred for a surgical opinion.

At this moment the debate regarding efficacy and safety of cervical transforaminal versus interlaminar injection of corticosteroids is ongoing. Therefore both techniques should be handled with caution and only after the patient has been fully informed of the risks.

Approximately 72% of patients experienced immediate pain relief in a 2007 research trial to evaluate the usefulness of a cervical interlaminar epidural steroid injection in patients with neck pain and cervical radiculopathy<sup>6</sup>. If pain relief is only moderately achieved with the first injection then another injection can be given in 2 weeks and may provide additional relief.

## CONCLUSION

We concluded that Cervical epidural injection has a valuable place in management of chronic pain syndromes, as 25% of the patients (5/20) had absolute relief of their symptoms after the first injection, where as an additional 10%(2/20) of the patients had absolute relief after the repeat injection. The incidence of complication was very low and only 1 out of 20(5%) patients reported oral thrush and laryngitis

## REFERENCES

1. Bonica JJ, Backup PH, Anderson CE, Hadfield D, Crepps WR, Monk BF: Peridural block: Analysis of 3, 637 cases and a review. *Anaesthesiology* (1957) 18:719
2. Hodges SD, Castle berg L, Miller T, Ward R, Thornburg C. Cervical epidural steroid injection with intrinsic spinal cord damage. *Spine* 1998; 23:2137-41.
3. Baker R, Dreyfuss P, Mercer S, Bogduk N. Cervical transforaminal injection of corticosteroids into a radicular artery: a possible mechanism for spinal cord injury. *Pain* 2003; 103(1-2): 211-5.
4. Botwin K, Castellanos R, Rao S et al. Complications of fluoroscopically guided interlaminar cervical epidural injections. *Arch Phys Med Rehabil* 2003; 84(5): 627-33.
5. Cervical interlaminar epidural steroid injection for neck pain and cervical radiculopathy: effect and prognostic factors. *Skeletal Radiol.* 2007 May;36(5): 431-6. Epub 2007 Mar
6. Kwon JW, Lee JW, Kim SH, Choi JY, Yeom JS, Kim HJ, Kwack KS, Moon SG, Jun WS, Kang HS. Cervical interlaminar epidural steroid injection for neck pain and cervical radiculopathy: effect and prognostic factors. *Skeletal Radiol.* 2007 May;36(5):431-6. Epub 2007