

## Caudal epidural injection

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Chronic low back pain is a ubiquitous problem. Epidural administration of steroids is one of our limited options. Although anesthesiologists might prefer the more familiar translumbar approach, caudal epidural injections are considered technically easier and safer, with minimal risk of inadvertent dural puncture.

A systematic review<sup>1</sup> found 18 randomized trials for caudal epidural injection. The evidence showed short- and long-term (> 6 mo) relief in chronic low back and lower extremity pain secondary to lumbar disc herniation, radiculitis or both, and discogenic pain without disc herniation or radiculitis. The review also included nonrandomized or case-control evidence for caudal epidural injections in managing low back pain from post-lumbar laminectomy syndrome and spinal stenosis.

Dr. Howe, a rural general practitioner with decades of experience with this procedure, offers his technique below.

Peter Hutten-Czapski, Scientific Editor

### REFERENCE

1. Conn A, Buenaventura RM, Datta S, et al. Systematic review of caudal epidural injections in the management of chronic low back pain. *Pain Physician* 2009;12:109-35.

**C**audal epidural injection for back pain and sciatica can be performed by family physicians without special training as long as they follow the correct procedure.

### INDICATIONS

- Caudal epidural injection can be considered for severe low back pain presenting as an emergency (after cord compression has been ruled out). If successful, it is the most effective form of analgesia and usually persists long after the local anesthetic would have worn off.
- The other indication is persistent low back or sciatic pain not responding to conservative measures.

### CONTRAINDICATIONS

- Sensitivity to local anesthetic
- Sepsis at the injection site
- Anticoagulant therapy
- Theoretically, previous neurologic infection, because the injected fluid might restart the inflammation

### ADVERSE EFFECTS

Adverse effects are rare but in theory include

- Infection
- Accidental spinal anesthetic, with or without hypotension, and spinal headache (if the dura is penetrated)
- Subperiosteal injection, which is not dangerous but is painful

- Temporary paralysis of the anal sphincter in the event of extensive superficial injection

In 50 000 injections using 50 mL of 0.5% procaine, Cyriax encountered 1 case of hypersensitivity, 2 of temporary paraplegia and 2 of chemical meningitis, and all 5 cases resolved spontaneously.<sup>1</sup>

## THEORY

The theca extends to about as low as the S1 level, so injections into the spinal canal below this level pass up extradurally and bathe the nerve roots.

## EQUIPMENT

- 20 G spinal needle
- 10 mL syringe
- 3 mL syringe with a fine needle
- Alcohol wipes
- 80 mg methylprednisolone
- Local anesthetic (some experts recommend procaine, but bupivacaine or lidocaine are acceptable; I use 1%)
- Ink pen

## PROCEDURE

Obtain consent after advising the patient of the rare possibility of adverse effects. Caution the patient that, although there is a good chance of immediate relief, the pain might get worse for a day or 2, even if the procedure is ultimately successful.

1. Have the patient lie in the prone position with a pillow under the symphysis pubis and buttocks exposed. If the pain is too severe to allow that position, the patient can lie on his or her side with hips flexed. Some physicians find it easier to palpate the landmarks with this position.
2. Draw up 9 mL of local anesthetic and 80 mg of methylprednisolone into the 10 mL syringe.
3. Feel for the 2 cornua of the sacral hiatus after separating the buttocks. There are 3 tricks if the cornua are not immediately obvious. One is to start below and move your finger up the dorsal surface of the coccyx until you encounter a slight "step." Another is to place the tip of your index finger over the anus, and the hiatus will be about the level of your proximal interphalangeal joint. A third trick is that the hiatus is at the point of a downward pointing equilateral triangle whose other 2 angles are the 2 posterior inferior iliac spines. I mark the cornua with a pen. Sterilize the skin with alcohol and allow it to dry.

4. Infiltrate the area with local anesthetic (with the 3 mL syringe and fine needle) in case you have to poke around a bit with the spinal needle, and use this to assess the angle of the lower sacrum.
5. Insert the spinal needle, with its stylet, into the space between the cornua on either side, the coccyx below and the arch of S5 above (Fig. 1). It may take a little manoeuvring to find the correct angle because it varies among patients, but it is roughly parallel to the body of S5 and very often horizontal or inclined slightly downward. Unless you get it exactly right, you may feel some resistance as the needle slides against bone.
6. Withdraw the stylet and wait to see if cerebrospinal fluid or blood drips out. If the former occurs, the patient is one of the rare few whose dura extends lower than usual and the injection must be abandoned to avoid giving a spinal anesthetic. If blood drips out, the needle can be repositioned to avoid an intravascular injection.
7. Assuming there is no leaking of cerebrospinal fluid, attach the 10 mL syringe containing local anesthetic and methylprednisolone and start to inject it slowly (Fig. 2). If you inject too quickly there is a danger of drowsiness from a pressure effect, so engage the patient in conversation as you inject. Place your other hand over the lower sacrum; if you feel the skin rise up your injection is too superficial.



Fig. 1. Inserting the needle.

8. As you continue the injection the patient may feel burning in 1 or both legs as the local anesthetic bathes the nerve roots, so, before you start, warn the patient that this might happen.
9. Remove the needle when all the material has

been injected and stuff a gauze swab in the natal cleft.

10. Have the patient wait a few minutes before getting up and walking. Any weakness will be syn-copal and not neurologic.



Fig. 2. Injecting anesthetic.

## FOLLOW-UP

Because of the possibility of transient worsening of symptoms, it is best to wait a week or 2 to assess the results. If pain improves and later recurs, the injection can be repeated. In my experience, the intervals between injections typically lengthen, and usually fewer than 4 are needed.

**Competing interests:** None declared.

## REFERENCE

1. Ombregt L, Bisschop P, Ter Veer HJ. Chapter 59. A system of orthopaedic medicine. 2<sup>nd</sup> ed. 2003. p. 903-16.

## RESOURCE

Cyriax JH, Cyriax PJ. *Cyriax's illustrated manual of orthopaedic medicine*. Oxford: Butterworth Heinemann; 1983. p. 226-30.

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