Epidural Steroid Injections (ESI)

Overview

An epidural steroid injection (ESI) is a minimally invasive procedure that can help relieve neck, arm, back, and leg pain caused by pinched or inflamed spinal nerves due to stenosis or disc herniation. Medicines are delivered to the epidural space, which is a fat-filled area between the bone and the protective sac of the spinal nerves. Pain relief may last for several days or even years. The goal is to reduce pain so that you may resume normal activities and a physical therapy program.

What is an epidural steroid injection?

A steroid injection includes both a corticosteroid (e.g., triamcinolone, methylprednisolone, dexamethasone) and an anesthetic numbing agent (e.g., lidocaine or bupivacaine). The drugs are delivered into the epidural space of the spine, which is the area between the bony vertebra and the protective dura sac surrounding the spinal nerves and cord (Fig. 1).

Corticosteroid injections can reduce inflammation and can be effective when delivered directly into the painful area. Unfortunately, the injection does not make a herniated disc smaller; it only works on the spinal nerves by flushing away the proteins that cause swelling. The pain relief can last from days to years, allowing your spinal condition to improve with physical therapy and an exercise program.

Who is a candidate?

Patients with pain in the neck, arm, low back, or leg (sciatica) may benefit from ESI. Specifically, those with the following conditions:

- Spinal stenosis
- Spondylolisthesis
- Herniated disc
- Degenerative disc
- Sciatica

ESI has proven helpful for some patients in the treatment of painful inflammatory conditions. ESI can also help determine whether surgery might be beneficial for pain associated with a herniated disc. When symptoms interfere with rehabilitative exercises, epidurals can ease the pain enough so that patients can continue their physical therapy.

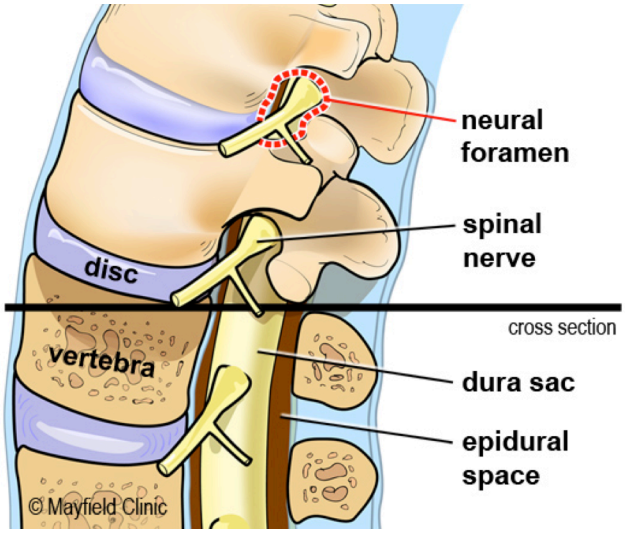

Figure 1. Side view of the spine. The epidural space is a fat-filled area that lies between the bony vertebra and the dura sac, which surrounds and protects the spinal cord and nerve roots.

ESI should NOT be performed on people who have an infection or have bleeding problems. The injection may slightly elevate blood sugar levels in patients with diabetes. It may also temporarily elevate blood pressure and eye pressure for patients with glaucoma. You should discuss this with your physician.

If you think you may be pregnant, tell the doctor. Fluoroscopy x-rays may be harmful to the baby.

Who performs the procedure?

Physicians who perform epidural steroid injections include physiatrists (PM&R), radiologists, anesthesiologists, neurologists, and surgeons.

What happens before treatment?

The doctor who will perform the procedure reviews your medical history and previous imaging studies to plan the best approach for the injections. Be prepared to ask questions at this appointment.

Patients who take aspirin or a blood thinning medication (Coumadin, Plavix, etc.) may need to stop taking it several days before the procedure. Discuss any medications with your doctors, including the one who prescribed the medication and the doctor who will perform the injection.

The procedure is usually performed in an outpatient center using x-ray fluoroscopy. Make arrangements to have someone drive you to and from the center the day of the injection.

What happens during treatment?

At the time of the procedure, you will be asked to sign consent forms, list medications you are presently taking, and if you have any allergies to medication. The procedure may last 15-45 minutes, followed by a recovery period.

The goal is to inject the medication as close to the painful nerve as possible. The type of injection depends on your condition and if you have metal rods or screws from previous surgery. The doctor will decide which type is likely to produce the best results.

Step 1: prepare the patient
The patient lies on an x-ray table. Local anesthetic is used to numb the treatment area so discomfort is minimal throughout the procedure. The patient remains awake and aware during the procedure to provide feedback to the physician. A low dose oral sedative, such as Valium or Versed, may be offered depending on the center.

Step 2: insert the needle
With the aid of an x-ray fluoroscope, the doctor directs a hollow needle through the skin and between the bony vertebrae into the epidural space. Fluoroscopy allows the doctor to watch the needle in real-time on the x-ray monitor, ensuring that the needle goes to the desired location. Some discomfort occurs, but patients more commonly feel pressure than pain.

There are several types of ESIs:

- **Cervical ESI (neck).** The needle entry site is from the side of the neck to reach the neural foramen, just above the opening for the nerve root and outside the epidural space (Fig. 2). Contrast dye is injected to confirm where the medication will flow.
- **Lumbar ESI (low back).** The needle entry site is slightly off midline of the back to reach the nerve canal (Fig. 3). Contrast dye is injected to confirm where the medication will flow.
- **Caudal ESI (tailbone).** The needle is placed in the sacral hiatus above the tailbone to reach the lowest spinal nerves. Contrast dye is injected to confirm where the medication will flow.

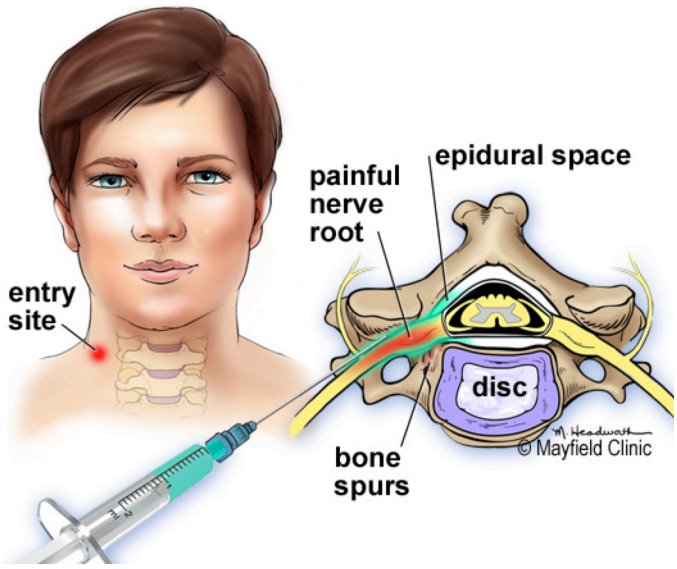

Figure 2: An ESI injection in the cervical spine for neck or arm pain. The needle is inserted from the side of the neck to reach the neural foramen to deliver the steroid medication (green) where the inflamed nerve root exits the spine.

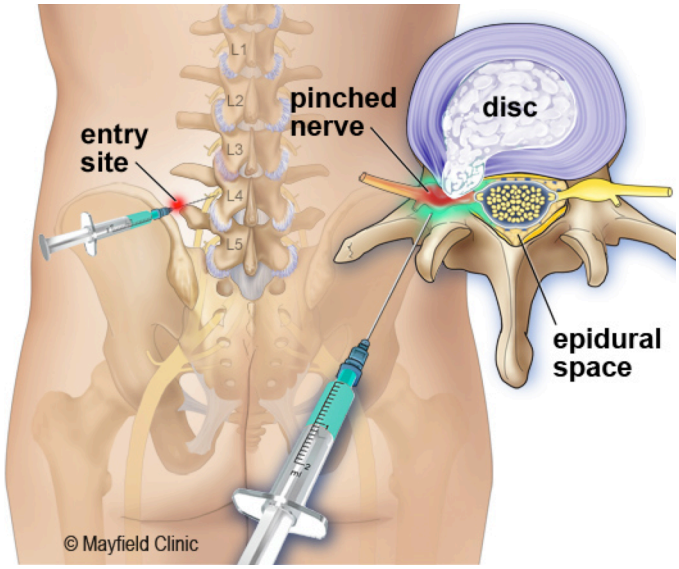

Figure 3: An ESI injection in the lumbar spine for leg or low back pain. The needle is inserted from the back on the affected side to reach the epidural space to deliver steroid medication (green) to the inflamed nerve root.

Step 3: inject the medication
When the needle is correctly positioned, the anesthetic and corticosteroid medications are injected into the epidural space around the nerve roots. The needle is then removed. Depending on your pain location, the procedure may be repeated for left and right sides. One or several spinal levels may be injected.

What happens after treatment?

Most patients can walk around immediately after the procedure. After being monitored for a short time, you usually can leave the center. Rarely temporary leg weakness or numbness can occur; therefore someone should drive you home.

Typically patients resume full activity the next day. Soreness around the injection site may be relieved by using ice and taking a mild analgesic (Tylenol).

You may want to record your levels of pain during the next couple of weeks in a diary. You may notice a slight increase in pain, numbness, or weakness as the numbing medicine wears off and before the corticosteroid starts to take effect.

Patients should schedule a follow-up appointment with the referring or treating physician after the procedure to document the efficacy and address any concerns the patient may have for future treatments and expectations.

What are the results?

Many patients experience pain relief benefits from ESI [1,2]. For those who experience only mild pain relief, one to two more injections may be performed, usually in 1-4 week intervals, to achieve full effect. Duration of pain relief varies, lasting for weeks or years. Injections are done in conjunction with a physical therapy and/or home exercise program to strengthen the back muscles and prevent future pain episodes.

What are the risks?

With few risks, ESI is considered an appropriate nonsurgical treatment for some patients. The potential risks associated with inserting the needle include spinal headache from a dural puncture, bleeding, infection, allergic reaction, and nerve damage / paralysis (rare).

Corticosteroid side effects may cause temporary weight gain, water retention, flushing (hot flashes), mood swings or insomnia, and elevated blood sugar levels in people with diabetes. Any numbness or mild muscle weakness usually resolves within 8 hours in the affected arm or leg (similar to the facial numbness experienced after dental work). Patients who are being treated for chronic conditions (e.g., heart disease, diabetes, rheumatoid arthritis, glaucoma, uncontrolled blood pressure) or those who cannot temporarily discontinue anti-clotting medications should consult their personal physician for a risk assessment.

Sources & links

If you have more questions, please contact Mayfield Brain & Spine at 800-325-7787 or 513-221-1100.

Links

http://www.spine-health.com
http://www.spineuniverse.com

Sources

1. Weinstein SM, Herring SA: NASS. Lumbar epidural steroid injections. Spine J 3(3 Suppl):37S-44S, 2003.
2. Lutz GE, Vad VB, Wisneski RJ: Fluoroscopic transforaminal lumbar epidural steroids: an outcome study. Arch Phys Med Rehabil 79:1362-1366, 1998.

Glossary

anesthetic: an agent that causes loss of sensation with or without the loss of consciousness.
corticosteroid: a hormone produced by the adrenal gland or synthetically made. Regulates salt and water balance and reduces inflammation.
degenerative disc: a breakdown or aging of the intervertebral disc causing collapse of the disc space, tears in the annulus, and growth of bone spurs.
epidural space: the area between the membrane surrounding the spinal cord and the vertebral wall that is filled with fat and small blood vessels.
fluoroscopy: an imaging device that uses x-ray or other radiation to view structures in the body in real time, or "live." Also called a C-arm.
herniated disc: the gel-like material within the disc can bulge or rupture through a weak area in the surrounding wall (annulus). Irritation, pain, and swelling occur when this material squeezes out and comes in contact with a spinal nerve.
sciatica: pain that courses along the sciatic nerve in the buttocks and down the legs. Usually caused by compression of the 5th lumbar or 1st sacral spinal nerves.
spinal stenosis: a narrowing of the spinal canal and nerve root canal can cause back and leg pain, especially when walking.
spondylolisthesis: a weakness or fracture between the upper and lower facets of a vertebra. If the vertebra slips forward, it can compress the nerve roots causing pain.

updated > 7.2018
reviewed by > Marc Orlando, MD, Mayfield Clinic, Cincinnati, Ohio