

Percutaneous Interventional Treatment Options for Back Pain

Spinal pain and radiculopathy are very common conditions. Acute spine pain of a nontraumatic origin has a good prognosis for spontaneous recovery when it is not associated with significant neurological deficits. One third of patients typically recover within one week, whereas two thirds recover within two months. With respect to those with disc herniations and spinal pain, only 10% have significant pain beyond 6 weeks. In turn, most of these patients can be treated successfully with conservative and medical therapies. However, a small proportion of patients with neck and back pain will not respond to these conservative measures and will continue to experience discomfort beyond 3 months.

There are many potential causes for pain of spinal origin, including the facet joints, intervertebral discs, nerve roots, ligaments and associated fascial structures. However, the origin of spinal pain can be quite complex and morphological alterations in imaging studies may not correlate with the patient's symptoms. Nevertheless, MRI and CT are the mainstay of diagnostic spinal imaging, at times supplemented with bone scans.

Spinal injection procedures comprise a relatively conservative treatment option for those with neck or back pain. They are thought to be more effective than oral medications because they deliver the active medication directly to the anatomical site implicated in generating the pain. Spinal injections can be subdivided into those performed for **diagnostic** purposes and those performed for **therapeutic** purposes alone. Given at times, the lack of specificity of existing imaging in elucidating the exact source of an individual's spinal pain, targeted diagnostic injections can be performed for diagnostic purposes as well as pain relief. If there are multiple levels involved and the patient is not a surgical candidate, therapeutic spinal injections can also be performed.

It should be acknowledged that the literature remains conflicted on the efficacy of these diagnostic and therapeutic spinal injections and each patient varies in their response. This is because pain is subjective and influenced by many factors including social, financial, psychological and legal factors as well as by placebo effect and the efficacy of concurrent therapies such as physical therapy and medications.

There are **many different types of percutaneous spinal injections**, including transforaminal epidural or selective nerve root injections, translaminar or interspinous epidural injections, facet joint blocks, medial branch blocks and rhizotomy. The most commonly performed percutaneous injections are selective nerve root blocks, facet joint blocks and interlaminar epidural steroid injections. These are performed under either fluoroscopic or CT guidance.

The **typical injectate** includes a long acting local anaesthetic, such as Marcaine 0.5% and a steroid preparation, such as triamcinolone, methylprednisolone or dexamethasone.

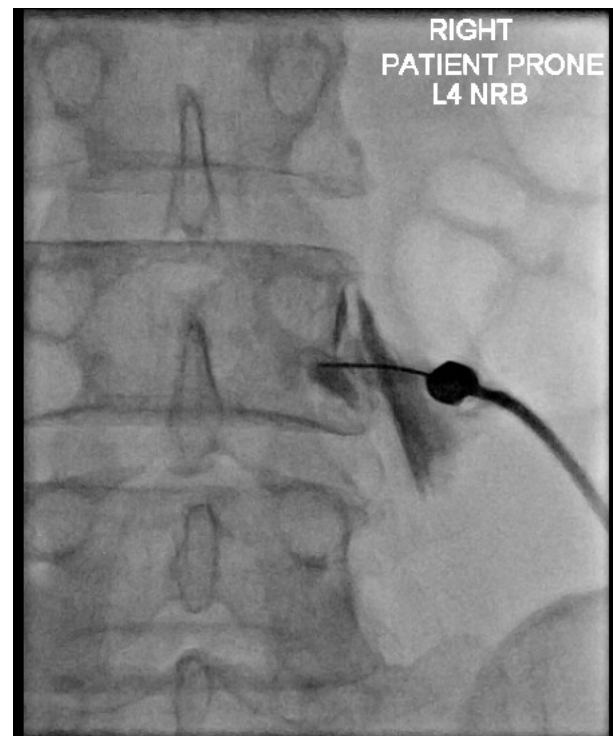


Fig 1. – Contrast confirmation of needle tip within the right L4 nerve root sleeve.

Often during a **selective nerve root block**, when the needle tip contacts the targeted nerve, the patient may experience a shooting pain, within the distribution of the selected nerve root. The goal of the procedure is to allow the injectate to come into contact with the locus of the pain generator, which is typically the radicular space. This is defined as fascial planes surrounding the nerve root, dorsal root ganglion and the spinal nerve as they exit the intervertebral foramen. For the most accurate assessment of spinal pain origin with this procedure, only one level at a time should be injected.

In the case of **translaminar epidural injections** the goal is therapeutic and not diagnostic. This is usually reserved for multilevel disc pathology and nonsurgical candidates. Once there is confirmation of the needle tip within the epidural space the injectate is allowed to diffuse around the epidural space and generally extends over 1-2 vertebral levels both superiorly and inferiorly. Larger volumes of injectate are used for this procedure than for selective nerve root blocks or facet blocks.

Facet joint injections are performed in an attempt to diagnose pain originating from a particular facet joint and to deliver injectate into the joint capsule itself, for pain relief. In the case of severe osteoarthritis it can be impossible to attain access into the joint due to osteophyte overgrowth. However, peri-articular injections are thought to provide some efficacy in the relief of facet joint pain.

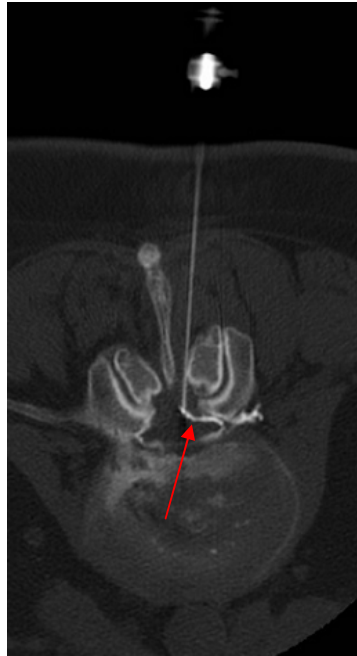


Fig 2. – Lumbar epidural injection.
Note contrast outlining the epidural space (arrow).



Fig 3. – Lumbar facet joint injection.
The needle tip is well within the joint space. Contrast can also be injected to confirm needle tip position.

As mentioned, there are a number of controversies within the literature regarding these procedures, which will not be covered in this article. However, the importance of good clinical assessment and long term follow up cannot be overstated. A good understanding of the natural history of the spinal disease being investigated is also vital. Pain relief from these percutaneous injections is not guaranteed, but in appropriately selected patients there is often identification of the locus of pain origin, (invaluable information for the treating surgeon/physician) and good pain relief for anywhere between 2 weeks to 3 months.

Andrew Smith

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