

Final Key Questions and Background

Facet Neurotomy for Treatment of Facet Joint Pain

Introduction

A large proportion of the adult population suffers from back or neck pain at some point in life. One of the possible sources of chronic back pain is degeneration of the facet joints. Typically, facet arthropathy (joint disease) develops progressively and the typical patient is over 50 years of age. Whiplash injuries can also result in cervical facet joint pain. It is estimated that the prevalence of facet joint pain is 10-15% in the low back, 40-50% in the mid-back, and 45-55% in the neck. However, these estimates vary widely with diagnostic methodology employed.

The primary physical sign suggestive of facet joint pain is paraspinal tenderness at the affected facet joints, and the dominant symptom is axial spinal pain. Other symptoms (e.g., radiating pain, pain that is exacerbated with certain movements) may also be present and suggestive of facet joint pain. There is no “gold standard” diagnostic tool for facet joint pain. Diagnosis of facet joint pain cannot be accurately made by physical or radiological examination alone and diagnostic nerve blocks may be the most accurate assessment method. Diagnostic medial branch blocks or intra-articular injections involve injection of local anesthetic. A positive block occurs when the patient experiences pain relief that lasts as long as the duration of action of the anesthetic used.

Once the facet joint is determined to be the source of pain as indicated by a positive diagnostic block, then prolonged pain relief may be achieved with destruction of the nerves to the affected joint in a procedure called facet neurotomy. Neurotomy does not cure the source of pain, but instead cuts off the pain signal to the brain by damaging the nerve. Different types of facet neurotomy are available, but the most common type employs radiofrequency needles to destroy the nerve tissue with heat generated by an electric current. During this procedure, the skin is anesthetized with a local anesthetic and the radiofrequency needles are advanced using guidance (usually fluoroscopic) to confirm that the needles are properly positioned at the presumed location of the nerves from the affected joint. A radiofrequency current is then applied to disrupt the ability of the nerves to transmit pain signals to the brain. Other names for this procedure include percutaneous radiofrequency denervation, nerve ablation, neurolysis, medial branch neurotomy, medial branch rhizotomy, and articular rhizolysis.

Policy Context

Facet neurotomy aims to treat pain resulting from facet joint disease, but it does not cure the condition. There are significant questions related to the diagnosis of facet joint pain, and treatment of facet joint pain with facet neurotomy.

Scope of this HTA**Population(s):**

Patients being considered for facet neurotomy due to suspected facet joint pain.

Intervention:

Facet neurotomy using FDA approved devices, other ablation techniques (e.g., chemical denervation).

Comparator(s):

Including but not limited to: alternative treatments, including sham neurotomy, therapeutic intra-articular injections or medial branch blocks, medical therapy, physical therapy, chiropractic therapy, natural history. Different types of facet neurotomy will also be compared if facet neurotomy is found to be effective compared with alternative treatments.

Outcomes:

The primary outcomes of interest are clinically meaningful pain relief and functional improvement. Secondary outcomes include health-related quality of life (including psychological status), return to work, patient satisfaction, and opioid use. Outcomes may include composite outcome measures. Additionally, safety and complications outcomes will be reported.

Key Questions

In patients with facet arthropathy or facetogenic pain:

1. With different regions of the spine (lumbar, thoracic, cervical facet) considered separately, what is the evidence that the use of diagnostic blocks (i.e., medial branch blocks or intra-articular injections with local anesthetic) to select patients for facet neurotomy improves clinical outcomes following facet neurotomy? Consider each of the following:
 - a. Diagnostic block versus alternative diagnostic test (e.g., physical examination, radiological examination)
 - b. Type of diagnostic block (i.e., medial branch block versus intra-articular injection) for patient selection
 - c. Use of a single diagnostic block versus two or more controlled diagnostic blocks (i.e., use of a short- versus a long-acting local anesthetic, or use of a local anesthetic versus saline)
 - d. Degree and duration of pain reduction from diagnostic block (e.g., pain relief of $\geq 30\%$ versus $\geq 50\%$, or $\geq 50\%$ versus $\geq 80\%$)
 - e. Unilateral versus bilateral diagnostic block
 - f. Diagnostic block of single versus multiple levels
2. With different regions of the spine (lumbar, thoracic, and cervical) considered separately, what is the evidence of short- and long-term comparative efficacy and effectiveness of facet neurotomy (FN) compared with alternatives (e.g., sham neurotomy, therapeutic intra-articular injections, etc.)?

- a. What is the evidence of the short- and long-term comparative efficacy and effectiveness of different types of facet neurotomy (e.g., radiofrequency, pulsed (cooled), chemical, cryoablation, laser)
 - b. What is the evidence of the short- and long-term comparative efficacy of repeat neurotomy procedures at the same level and the same side as the initial procedure?
 - c. Is there evidence of differential effectiveness when conducting unilateral versus bilateral facet neurotomy?
 - d. Is there evidence of differential effectiveness when conducting facet neurotomy on single versus multiple spinal levels?
3. With different regions of the spine (lumbar, thoracic, and cervical) considered separately, what is the comparative evidence regarding adverse events and complications during the periprocedural period and longer term for facet neurotomy?
 4. With different regions of the spine (lumbar, thoracic, and cervical) considered separately, is there evidence of differential efficacy or safety compared with other treatment options in subpopulations? Include consideration of age, gender, race, ethnicity, disability, and workers compensation.
 5. With different regions of the spine (lumbar, thoracic, and cervical) considered separately, what is the evidence of cost effectiveness of facet neurotomy compared with other treatment options?

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