Talking to Patients About Lumbar Facet Denervation (Medial Branch Neurotomy)

By Ronald Fudala, DC, DACAN

Lumbar facet denervation, more appropriately termed *medial branch neurotomy* (MBN), is a procedure that may be considered when patients suffer from recalcitrant non-radicular axial back and/or leg pain. While it is likely you have encountered or will encounter patients warranting deliberation of interventional procedures, it could be just as likely your patients may be advised by allopathic professionals, to undergo such procedures – even though their current conservative treatment has resulted in equivalent or better benefit. Let’s discuss the information necessary to answer four critical questions regarding MBN, enabling you to offer accurate and authoritative guidance for your patients. Those questions are:

- How reliably can lumbar facet pain be diagnosed?
- What results can be expected from the procedure?
- What are the risks associated with the procedure?
- Will this procedure offer benefit beyond what has already been attained?

Pain in Facet Joints: Tough to Track Down

It has long been known and is now well-accepted that the facet joints are structures capable of producing pain. In 1963, Hirsh, et al., first demonstrated the capacity of the facet joint to produce pain by the injection of hypertonic saline into the joint.\(^1\) Mooney and Robertson later delineated their typical lower extremity referral patterns now well-known to most of us.\(^2\) Subsequent investigators have further confirmed the presence of facet joint nociceptive fibers capable of pain transmission.\(^3\)\(^-\)\(^5\)

However, less well-agreed-upon, compared to the joint’s capacity for pain production, is the frequency with which this occurs and the precision with which it can be accurately diagnosed. The reported incidence of lumbar facetogenic pain shows wide variation. Most studies note an occurrence between 15-45 percent, depending on the diagnostic criteria utilized.\(^6\)\(^-\)\(^8\) Schwartz, et al., have even suggested a 4 percent rate for the facet joint serving as a sole source of pain.\(^9\)
Diagnostic precision for implicating facet pain is compromised in ways similar to that of confirming other potential sources of structural involvement. Spinal imaging, in general, is of little value in most non-neurogenic back pain syndromes. Pertaining specifically to the facet joints, abnormal imaging changes have been shown to have no relationship to the presence or magnitude of pain experienced.

Adding to the diagnostic dilemma is that no particular pain pattern, clinical bedside test or combination of tests can consistently and reliably distinguish facet-mediated pain from that originating in other structures.

**Diagnostic Considerations: Pros & Cons of Nerve Blocks**

In 1998, Revel, et al., demonstrated that patients matching 5/7 clinical criteria exhibited a 75 percent pain reduction on subsequent anesthetic blocks. These criteria were: age > 65, pain well-relieved by recumbent position, absence of pain with coughing, pain not worsened by forward flexion, pain not worsened when rising from flexion, pain not worsened by hyperextension, and pain not worsened by extension-rotation test. Further studies have shown that matching these criteria provides high specificity, but very low sensitivity in identifying those likely to benefit from anesthetic blocks.

In the absence of predictive clinical or radiologic findings, **nerve blocks** are considered to be the best way of diagnosing presumed facet-mediated pain. However, at present, there is no clear consensus on how a diagnostic block should be performed, or the threshold and duration of pain relief that constitutes a positive response. This is largely due to the lack of a gold standard of diagnosis to which nerve blocks could be compared.

Controlled diagnostic blocks imply having a patient undergo two separate injections, at different times, using anesthetic agents of different durations of action. A positive response occurs when a threshold of pain relief (usually between 50-80 percent) is experienced and the duration of relief is consistent with the known duration of the anesthetic. Single diagnostic blocks use only a single injection and anesthetic agent.

There are pros and cons to each approach. Falco, et al., in what appears to be the most recent review on the accuracy of these procedures, found that false positive rates ranged between 17-66 percent, being more common when single blocks or thresholds of pain relief less than 75 percent were used. Derby, et al., confirmed this finding, also noting that using pain-relief thresholds above 75 percent correlates with improved outcomes after medial branch neurotomy.
However, additional research by Derby illustrated that using such highly specific criteria may unnecessarily exclude patients who could potentially benefit from interventional denervation. He found that 20 percent of patients with less than 50 percent relief, and up to 47 percent of patients with 50-69 percent relief (each considered to be negative responders to diagnostic blocks), went on to show a greater than 50 percent improvement in pain after undergoing medial branch ablation.\textsuperscript{24}

It is also important to understand that pain relief subsequent to medial branch blocks does not implicate the facet joint with certainty. The medial branch also provides innervation to the multifidus, interspinous ligaments, periosteum of the neural arch, and the interspinal muscles.\textsuperscript{25-26} Ackerman, et al., further illustrated how the facet joints can be falsely implicated by demonstrating that anesthetic infiltration of the paraspinals, without direct anesthesia of the medial branch nerve, can lead to similar reductions in axial low back pain.\textsuperscript{27}

**Medial Branch Neurotomy: Let’s Look at the Research**

Although medial branch neurotomy may benefit properly selected patients, the relief achieved is rarely complete or permanent. Because of this, treatment decisions are best based upon having a realistic understanding of expected outcomes in relation to a patient’s current level of pain and physical function.

Dreyfuss, et al., followed 15 patients showing >80 percent relief on controlled diagnostic blocks. Thirteen had relief of >60 percent at one year, with nine exceeding 90 percent pain reduction.\textsuperscript{28} Lakemeir, et al., assessed the six-month response to medial branch neurotomy in 29 patients after showing a minimum of 50 percent pain relief to a single diagnostic block. Average pain scale reduced from 6.6 to 4.7. Oswestry Index reduced from 40.8 to 28. This study also compared facet denervation to intra-articular steroid injection, finding no statistical difference between the two procedures.\textsuperscript{29}

The response to radiofrequency rhizotomy after having successful comparative nerve blocks in Goldfeld, et al.’s study of 174 patients showed 119 having good (50 percent) to excellent (80 percent) pain relief and 55 showing no improvement. Ninety-six of those with good-excellent responses had relief lasting between 6-24 months, with 43 percent of that cohort showing sustained benefit for two years.\textsuperscript{30}

Cohen, et al., followed 262 patients who had a positive controlled diagnostic block with >50 percent pain relief. Following medial branch neurotomy, 54 percent had pain relief >50 percent lasting at least six months. There was no difference in response between those reporting >80 percent relief on confirmatory
blocks as compared to those reporting relief of between 50-80 percent.\textsuperscript{31}

A later Cohen study reinforced this finding, further concluding that the use of more stringent diagnostic criteria (higher pain-relief thresholds or double as compared to single blocks) would likely result in withholding a beneficial procedure from a substantial number of patients without a corresponding improvement in success rates.\textsuperscript{32}

Not all studies have shown favorable results for medial branch neurotomy. One of the largest double-blind, randomized trials found no difference in VAS scores, physical function or medication use between active intervention and sham groups.\textsuperscript{33} Leclair, et al., found similar disappointing results after monitoring 70 patients who had experienced relief after a single diagnostic facet injection. At 12 weeks, no difference was seen between an active treatment and sham group.\textsuperscript{34}

Although this was one of the larger studies on facet denervation, it has been criticized for the lack of an adequate description of what constituted a positive diagnostic block.\textsuperscript{35} Similar criticism of reports finding evidence of procedural ineffectiveness have been echoed by Bogduk, et al., who stated: "Negative results have been reported only in studies that selected inappropriate patients or used surgically inaccurate techniques."\textsuperscript{36}

\textit{Editor's Note}: Part 2 of this article will continue the discussion of the benefits / risks of medial branch neurotomy, including key points for chiropractors to understand and share with patients who may be considering / advised to undergo this procedure.

\textit{References}


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