Medial Branch Blocks Versus Pericapsular Blocks in Selecting Patients for Percutaneous Cryodenervation of Lumbar Facet Joints

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Background and Objectives: At many institutions, it is not practically feasible to perform a series of controlled or placebo-controlled medial branch blocks on several facet joints in order to select patients for facet joint rhizotomy. As for uncontrolled blocks, there is no proof that medial branch blocks are superior to other types of blocks. This study was performed to compare medial branch blocks to simple pericapsular blocks for the selection of patients for lumbar facet joint cryodenervation.

Methods: Patient selection was based on history, imaging, and physical examination. Diagnostic blocks were either medial branch blocks or pericapsular blocks. Percutaneous medial branch cryodenervation was performed by use of a Lloyd Neurostat 2000. Outcome parameters were low back pain (visual analog scale [VAS]), limitation of activity (Macnab), and overall satisfaction. A total of 26 patients were recruited, 13 for each group. Follow-up was 6 months.

Results: Patients who had been selected by medial branch blocks had better pain relief than did patients who had been diagnosed by use of pericapsular blocks. At 6 weeks and at 3 months after treatment, these results reached statistical significance (VAS 2.2 *v* 4.2, $P < .05$).

Conclusions: Our results suggest that uncontrolled medial branch blocks are superior to pericapsular blocks in selecting patients for facet joint cryodenervation, but both blocks work. If serial controlled blocks cannot be used, lumbar facet joint pain remains a diagnostic dilemma. *Reg Anesth Pain Med 2007;32:27-33.*

Key Words: Cryodenervation, Diagnostic blocks, Facet joint, Lumbar, Rhizotomy, Zygapophyseal joint.

A significant amount of work has been done to determine which diagnostic injection technique is most predictive of successful subsequent denervation of lumbar facet joints.[1-6] Intra-articular blocks may be as effective as medial branch blocks in diagnosing lumbar facet joint pain in the view of some authors,[7-9] but at osteoarthritic joints and especially the L5/S1 joints, where the joint line is oriented more coronally, strict intra-articular injections may be difficult to perform. As a consequence, either controlled medial branch blocks (by use of a short-acting *v* a long-acting local anesthetic) or placebo-controlled blocks (by use of a local anesthetic *v* normal saline) have been suggested as the gold standard for diagnosing facet joint pain.[1,10] Using placebo-controlled medial branch blocks, a study demonstrated at least 60% relief in 87% of patients treated,[11] but in most other trials, "excellent" and "good" results do not exceed 65% of treated patients. However, this ideal diagnostic pathway is very impractical in a clinical setting, because it requires several repeated diagnostic injections, especially when neighboring levels (for example, L4/5 and L5/S1 as the most frequently affected) need to be tested individually, as well as in combination and with placebo control. To illustrate this problem, imagine the following scenario: A low back pain patient has bilateral osteoarthritis of the L4/5 and L5/S1 facet joints visible on plain x-rays and on CT-scan, as well as maximum tenderness to localized pressure somewhere in between those 2 joints. He also points to this area when asked where pain is greatest or even highlights this region in a pain

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drawing. First, verum blocks of the L3 and L4 medial branches would have to be performed, followed by the placebo (or control) blocks on another day or vice versa. Then, verum blocks of the L4 medial branch and the L5 dorsal ramus would have to be performed, followed by the placebo (or control) blocks on another day or vice versa. If both block series bring about considerable pain relief, they would have to be followed by verum and placebo (or control) blocks of the L3 and L4 medial branch and the L5 dorsal ramus together, to ascertain that the pain relief generated by blocking both facet joint levels is greater than when blocking only 1 level. In total, this procedure would require a minimum of 6 diagnostic injection sessions before rhizotomy. Most health insurers would not be willing to reimburse for such a detailed work-up, an issue that has been discussed.[12]

Because we are unable to perform such extensive diagnostics in the spine clinics of a large university department, we currently use uncontrolled, medial branch blocks to select patients for lumbar facet joint cryodenervation. This denervation method was developed in the 1970s by Lloyd et al.[13] and has also been used by other investigators for facet joint neurotomy.[14-16] Although not completely unexpected, our own results paralleled those of other authors, ranging around 65% to 70% successful procedures.[17] Before we adopted the medial branch technique for facet joint diagnostics, we had been using fluoroscopy-guided, nonselective, pericapsular facet injections. With this technique, a needle is positioned under the fluoroscope onto the posterior capsule of a lumbar facet joint without an attempt to enter the joint space, and a local anesthetic is injected; only 1 injection per joint is required as opposed to 2 injections per joint with medial branch blocks. The objective of this study was to determine whether uncontrolled medial branch blocks are any better in predicting successful outcome of cryodenervation than are the rather imprecise pericapsular blocks. Our hypothesis was that no differences would exist between groups.

Methods

Patients

Study subjects were recruited from our spine clinics. All these patients had exhausted conservative treatments such as physical therapy, chiropractic therapy, back braces, NSAIDs, analgesics, or acupuncture for a minimum of 3 months. Inclusion criteria were nonsciatic low back pain, localized paraspinal pain and localized tenderness to pressure, recognized as typical by the patients, and positive diagnostic medial branch blocks or pericapsular blocks as described below. Exclusion criteria were the presence of radicular (sciatic) pain, previous lumbar-spine surgery with the exception of nucleotomies, relevant spinal-canal stenosis, activated erosive spondylochondrosis, malignant tumors, chronic inflammatory disease, a history of depression, and pending workman's compensation cases. The additional presence of pseudoradicular (referred) pain, responsive to the diagnostic blocks, was not considered an exclusion criterion. When meeting the clinical criteria and before proceeding to the diagnostic blocks, patients were asked to participate in the study. Our institutional review board approved the study; written informed consent was obtained for the diagnostic blocks, the denervation procedure itself, and for the collection, analysis, and publication of anonymized medical data.

Study Design, Group Allocation, and Parameters

The study was designed as a prospective, controlled trial, with the group that underwent diagnostic testing by medial branch blocks serving as a control for the group that underwent testing with pericapsular blocks. Patients were assigned to receive either pericapsular blocks or medial branch blocks, according to a computer-generated randomization list, and when a positive response was recorded, were assigned to the matching study groups. Out of 41 patients tested, 26 tested positive and were entered into the study (13 in each group). The average age (± SD) was 55.5 ± 11.5 years in the pericapsular block group and 55.3 ± 12.4 years in the medial branch block group. Our main outcome parameter was the intensity of low back pain, as measured by visual analog scale (VAS 0 to 10). For each measurement, patients were asked to rate the average low back pain experienced during the preceding 24 hours. The ability to perform everyday activities (in the presence of low back pain) was rated according to a simplified Macnab rating (3 = excellent, 2 = good, 1 = moderate, 0 = poor).[18] General satisfaction with the therapy result was assessed by the following question: Given the same level of low back pain as before the procedure, would you choose to have it performed again? Data were collected before the procedure, as well as at 2 weeks, 6 weeks, 3 months, and 6 months. A time period of 6 months was considered sufficient to give evidence to any significant differences in outcome between the 2 diagnostic procedures.