Spinal pain

When is it time for an intervention?

Gary M. Franklin, MD, MPH

John Markman, MD

The number of working-aged persons in the United States who are disabled and unable to lead productive lives has increased dramatically in the past 3 decades,¹ swelling the rolls of the Social Security Disability Insurance system to a financial tipping point. As a useful metric to quantify this disability, the US Burden of Disease Collaborators have identified 3 of the top 5 causes of years lived with disability (YLD) in the United States: back, neck, and other musculoskeletal disorders accounted for about 6.2 million YLD in 1990 and 7.9 million YLD in 2010.² It is critical that neurologists understand the complex tradeoffs of risk and benefit that invariably go along with addressing the pain symptoms that are often at the heart of disability claims. Utilization rates and costs have soared for all types of diagnostic and treatment services for spinal pain, including the interventions discussed in this issue. Growing expectations for pain relief and a diminishing tolerance for activity limitation have not been met with a wave of innovative treatments that either prevent the transition from acute to chronic pain or more effectively treat chronic pain.

In this issue of *Neurology® Clinical Practice*, 2 senior Mayo Clinic clinicians, a neurologist and an interventional anesthesiologist, provide a careful assessment of 3 types of spinal injection: therapeutic epidural steroids for radicular pain primarily associated with disc herniation,³ medial branch diagnostic block and neurotomy for facet-mediated pain,⁴ and diagnostic diskography for the assessment of so-called diskogenic pain.⁵ The latter 2 are injections/treatments aimed at axial-predominant spinal pain syndromes, that is, chronic low back pain with a relatively minor painful radicular component. Efficacy/effectiveness, safety, and cost should all be weighed when neurologists are treating and referring patients with these chronic pain syndromes.

Epidural steroid injections are the most highly studied of the therapeutic spinal injection types. In a patient with a primarily painful lumbar radicular pain but in the absence of signs of a deteriorating nerve root, this type of injection may seem to be an attractive treatment alternative. Bartleson and Maus³ cite well-done systematic reviews from both the American Academy of Neurology (2007)⁶ and the American Pain Society (2009)⁷ that fair evidence suggests short-term pain relief.

Departments of Environmental and Occupational Health Sciences, Neurology, and Health Services (GMF), University of Washington, Seattle; Washington State Department of Labor and Industries (GMF), Olympia; and Departments of Neurosurgery and Neurology (JM), University of Rochester, NY.

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Correspondence to: meddir@uw.edu

As with other therapies for chronic low back pain, including behavioral approaches, there is minimal evidence for long-term functional benefit.⁸ In a Washington State Health Technology Assessment review, the average number of all spinal injections received per patient between 2006 and 2009 was 3.1 (Medicaid), 3.9 (state employees), and 4.3 (workers' compensation).⁹ A relatively robust cost–utility analysis conducted in the United Kingdom stressed that an epidural steroid injection is not a stand-alone therapy. Rather, the authors recommended that such intervention should be viewed as part of a package of rehabilitative care where a coherent analgesic strategy is provided and potential psychosocial barriers to rehabilitation are addressed in a systematic fashion.¹⁰

Diagnostic medial branch blockade for the diagnosis of axial back pain aims to localize a syndrome to richly innervated, osteoarthritic facet joints. The lack of sensitivity and specificity of imaging studies and inability of physical and neurologic examination to discriminate a symptomatic facet joint from other potentially painful spinal structures prompts clinicians to perform provocative testing.⁴ The best study on this type of diagnostic blockade required complete relief of pain,¹¹ but most studies simply require partial relief of the low back or neck pain. A patient in Washington State receiving this procedure will receive about 4 neurotomies, likely reflecting both the difficulty with localization and the redundancy of medial branch innervation of the facet joints. In one relatively well-done randomized trial of 376 patients with paravertebral tenderness screened with diagnostic facet (medial branch block) injections with 0.5% bupivacaine, 115 (30%) were negative, and of the remaining 261 who were positive, 150 failed either the control injection or had too prolonged a response.¹² Only 30% of patients initially thought to be good candidates for diagnostic facet injection remained eligible for neurotomy. This need for careful selection highlights the challenge of treatment matching in chronic low back pain, especially when symptoms are attributed to a specific, degenerative structural defect. The evidence for analgesic benefit is more robust for radiofrequency ablation of the medial branches in the cervical spine relative to the lumbar segments.

Diskography is the most controversial procedure covered by Maus and Bartleson.⁵ There is no way to confirm or refute their opening claim that “the most common cause of chronic low back pain is internal disc disruption or diskogenic pain,” but it strikes us as overly simplistic. The authors concede that the principal reason to perform diskography is to identify patients most likely to benefit from arthrodesis for axial low back pain. In contrast to the evidence for the benefit of arthrodesis in the setting of unstable grade II spondylolisthesis due to bilateral pars fracture, there is little consensus, even among surgeons, regarding this indication for lumbar fusion surgery for so-called diskogenic pain. As the authors concede, diskography has no therapeutic intent other than providing an explanatory model for a highly selected subset of patients with suspicion of a single culprit lumbar segment and without certain comorbid mental health problems and catastrophizing behaviors. Emerging evidence informs the hypothesis of accelerated disc degeneration in patients who have undergone diskography.¹³

The role of diagnostic and treatment approaches focusing on peripheral “pain generators” are evolving as the evidence for central modulation of pain intensity in chronic musculoskeletal pain grows.^{14,15} The analgesic benefit of duloxetine in recent clinical trials of nondepressed patients with axial predominant chronic low back pain bolsters the search for therapeutic targets in the CNS.¹⁶ Treatments shown to address the psychosocial variables that often modulate chronic pain intensity, such as fear avoidance and catastrophizing, are an essential concomitant of medical and procedural approaches.^{17–19} Further investigation of best practices that can accomplish effective secondary prevention to prevent unnecessary disability and the transition to chronic pain should be of the highest priority.²⁰

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