

## Effect of Intradiscal Electrothermal Treatment with a Short Heating Catheter and Fibrin on Discogenic Low Back Pain

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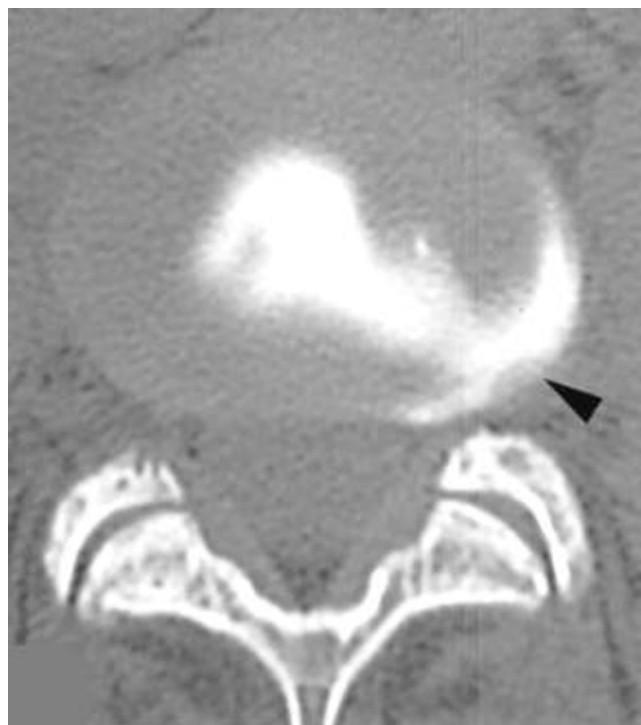
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This report illustrates the dramatic improvement of incapacitating low back and leg pain after intradiscal electrothermal treatment, using the recently developed shorter heating element, and an injection of fibrin sealant.

A 44-yr-old woman presented to a private spinal interventional clinic with complaints of severe left-sided low back and leg pain radiating to the great toe. Her symptoms started after a car accident approximately 3 yrs before and were progressively worsening. She originally started with physical therapy and received epidural steroid injections three times within 1 yr, but her symptoms were not relieved. She denied any bowel or bladder dysfunction or any leg weakness. Her symptoms worsened mostly with sitting, bending, and driving. She was somewhat better with lying down.

The initial physical examination was normal. The magnetic resonance imaging revealed a minimal posterior annular bulge in the L4-5 intervertebral disc. During pressure-controlled manometric discography, she experienced 10/10 (Numeric Rating Pain Scale) concordant pain. A computed tomographic study immediately followed and revealed a grade 4 left posterolateral annular tear at the L4-5 level extending to the outer annulus just proximal to the L4-5 foramen (Fig. 1). An electromyographic study was normal.

Despite continuous conservative management, including opioid medication, 1 yr after evaluation her symptoms had significantly worsened, with a constant pain scale of 10/10. Because of her poor response to conservative care and her desire to avoid reconstructive surgery, we performed an intradiscal electrothermal treatment using a SpineCATH intradiscal catheter (Fig. 2) with fibrin sealant. No flare-up related to the procedure was reported. At a 1-mo follow-up visit, she had withdrawn from all opioid

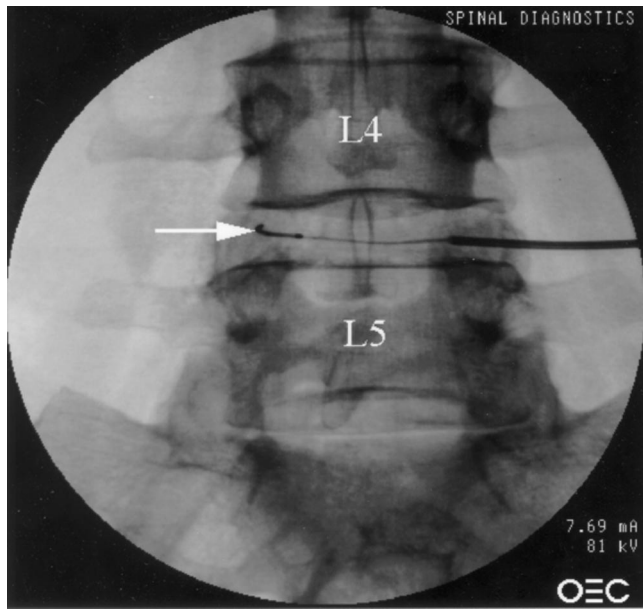


**FIGURE 1** Computed tomographic discogram showing a left posterolateral annular tear (arrowhead), which extends circumferentially within the substance of the annulus fibrosus just proximal to the foramen.

drugs. The leg pain was completely relieved, and mild low back pain continued, with a pain scale rating of 2/10. She returned to her work with job modification. At a 3-mo follow-up visit, the patient had returned to full duty, with the only limitation being heavy lifting. Her back pain is now completely resolved, and she experiences only slight, intermittent, left-leg symptoms.

Intradiscal electrothermal treatment is a minimally invasive procedure using thermal energy for managing chronic discogenic LBP.<sup>1</sup> The reason intradiscal electrothermal treatment relieves discogenic pain remains speculative, but destruction of nociceptors or thermal modulation of collagen could contribute to pain relief.<sup>2</sup> However, studies show that intradiscal heating causes thermal necrosis of tissue, and injury of the normal annulus caused by long heating elements could be a cause of prolonged flare-ups and unsatisfactory outcome.<sup>3</sup> The recently introduced SpineCATH intradiscal catheter has a shorter (1.5 cm) active electrothermal tip rather than the standard 6-cm-tip catheter and might theoretically afford better outcomes with less prolonged flare-ups.

Fibrin sealant has recently been introduced as an effective instrument in the care of surgical patients and has been used as an adjunct to hemostasis, wound healing, and tissue adhesion. The fibrin may enhance the repair process



**FIGURE 2** *Fluoroscopic image (anteroposterior view) of intradiscal electrothermal treatment. The short heating catheter tip (arrow) is positioned in the left-side outer annulus. The position is consistent with the computed tomographic discogram showing the disruption laterally, extending to the foramen.*

via various mechanisms, including acting as biological glue, providing a scaffold for ingrowing fibroblasts, and stimulating reparative cells.<sup>4</sup> This report demonstrates dramatic and rapid symptom relief that probably occurred secondary to effective thermal ablation of nociceptive neural fibers growing into a grade 4 annular fissure. The addition of fibrin sealant may also have helped “seal” the annulus and prevent leakage of inflammatory substances into the epidural space.

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