Selective Endoscopic Discectomy and Thermal Annuloplasty for Chronic Lumbar Discogenic Pain: An Endoscopically Guided, Visualized Intradiscal Electrothermal Procedure

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Introduction: The pathogenesis of lumbar chronic discogenic pain (CLDP) has been hypothesized, studied, and generally accepted by clinical studies, but few treatment methods have gained universal acceptance. After non-surgical treatments fail, the choices of traditional surgical intervention are limited. The purported mechanism of each surgical procedure's effectiveness is dependent on one or a combination of the following concepts: 1. Eliminate or modify motion at the diseased mobile interspace (fusion); 2. Relieve intradiscal protrusion and pressure (discectomy); 3. Ablate neural sensors in the periannular regions (IDET).

Endoscopic Selective Discectomy and bipolar radio-frequency thermal annuloplasty was used to test the hypothesis that chronic leakage of the inflammatogenic by-products of a degenerating nucleus pulposus through the defects in the annulus fibrosus sensitizes neural sensors in the periannular regions, resulting in a painful inflammatory response. If the hypothesis is correct, removal of the inflamatogenic material (discectomy) and ablation of the neural sensors in the annular defects and closure of the defects (thermal annuloplasty), would decrease discogenic pain.

Method: An IRB approved prospective study of 113 consecutive patients undergoing endoscopic thermal annuloplasty for chronic lumbar discogenic pain with a minimum follow-up of two years served as the basis for this report. In contrast to the strict patient selection necessary for subsequent IDET studies, we included all patients with degenerated, protruding discs severe concordant discogenic back pain with provocative discography.

Results: Seventeen patients (15%) had excellent results; thirty-two patients (28.3%) had good results; thirty-four patients (30.1%) had a fair result; thirty patients (26.5%) had poor result. Inflammatory granulation tissue and nucleus pulposus embedded in the annular layers were common findings. Two patients experienced severe dysesthesia, one fully recovered and one patient with unrecognized co-morbidities of epilepsy and peripheral neuropathy had permanent radiculopathy.

Discussion: Stratification of the Good and Excellent results allowed refinement of the patient selection process to the current selective nucleotomy and radio-frequency thermal annuloplasty technique. SED with thermal annuloplasty then produced consistent clinical results when compared to IDET. The addition and combination of selective discectomy with visualized thermal annuloplasty serve as an improved, “visualized IDET” for discogenic back pain. This is the first known clinical experience report in the English literature on a visualized electro-thermal technique. Using the technique described, our satisfactory results are comparable to more conventional, but more invasive surgical therapies such as fusion and Total disc Replacement, but with much less cost and surgical morbidity.

Conclusions: The posterolateral transforaminal endoscopic approach to the disc allows for intradiscal visualization and probing of the annulus and nucleus pulposus. This tissue sparing access portal opens the door to new intradiscal treatment as a surgical therapy that does not “burn any bridges” for subsequent non-surgical and surgical treatment. The transforaminal access portal utilizing an endoscope will allow further research into the generators and causes of discogenic pain in the early stages of disc herniation. It also allows for earlier and more effective surgical treatment in a population of patients with prodromal symptoms of disc herniation and radiculopathy.