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Original Research

Transforaminal endoscopic system technique for discogenic low back pain: A prospective Cohort study

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HIGHLIGHTS

- The diagnosis and treatment for discogenic low back pain (DLBP) are controversial.
- TESSYS is an effective treatment for the treatment of DLBP.
- A complete management of the inflammatory granuloma is the key point in treating DLBP.

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ABSTRACT

Objective: To investigate the clinical outcomes of transforaminal endoscopic system(TESSYS) for discogenic low back pain(DLBP).

Methods: 62 consecutive patients with one-level DLBP applying to the including criteria underwent TESSYS from January 2010 to December 2013. These patients included 38 males and 24 females with a mean age of 42.7 ± 5.4 years (range, 18–73 yr) and a mean follow-up of 26.8 ± 4.2 months (range, 12–48 months). The visual analog scale (VAS) were used for back pain, the Oswestry Disability Index (ODI) for lumbar function, and the modified MacNab criteria for clinical global outcomes.

Results: 24 patients showed only inflammatory granuloma on annulus tear tissues(Group A), 16 patients showed no annulus tear but adhesion and inflammatory granuloma among the intracanal annulus fibrous(AF), posterior longitudinal ligament(PLL) and the abdomen side of the dura sac(Group B) and 22 patients showed both(Group C). Concordant pain could be triggered by touching the inflammation with the bipolar radiofrequency probe. The success rate (excellent and good) of group C was much higher than A and B($P < 0.05$). The whole success rate was 75.8%. Of the 4 patients with poor result, 2 refused further surgical treatment and showed either no improvement or worsening. The remaining 2 patients had spinal fusion surgery and achieved better results. VAS and ODI had significantly improved after surgery ($P < 0.01$). No unexpected complications were seen.

Conclusion: TEEYS is an effective method in treating DLBP and the complete management of the inflammatory granuloma was the key point in achieving better results.

1. Introduction

Discogenic pain is described as low back pain caused by disc degeneration and/or annular rupture. It is the pain with or without leg pain and sometimes associated with sitting intolerance, an extension catch, difficulty lifting, or an inability to maintain the same posture [1,2]. DLBP accounts for approximately 40% of the cases of chronic low back pain [2]. Thus, this disease has become a serious medical and social problem responsible for disability both in work and recreation [2].

Concerning the treatment for DLBP, no form of conservative therapy have been tested. In clinical, conservative therapies are typically applied before the diagnosis of DLBP. Surgical treatments include spinal fusion and disc arthroplasty [3]. However, open surgery is very invasive, and can incur complications that lead to

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persistent pain and functional impairment, even though the procedures are correctly performed [4]. Thus, minimal invasive percutaneous, intradiscal procedures have been reported and have achieved good outcomes [1,5,6]. However, previous studies all adopted intradiscal technique, which belongs to Yeung endoscopic spine system(YESS) technique [1,5,7]. This study is the first to investigate the clinical outcomes of TESSYS technique for DLBP.

2. Materials and methods

This study was approved by the Ethics Committee of xxxxxxxxx. All of the medical records were anonymous, and no patient information was extracted except for research purposes.

2.1. Patients selection

We evaluated 77 consecutive patients in our study from January 2010 to December 2013. The including criterions were as follows: 1) chronic low back pain with two or more typical clinical manifestations: sitting intolerance, extension catch, lifting difficulty, or an inability to maintain the same posture; 2) no radicular pain or signs of radiculopathy on physical examination of the lower extremity; 3) patients who had chronic low back pain>2 years and showed little improvement from conservative treatment for 6 months; 4) patients who showed disc degeneration on MRI(Fig. 1a); 5) patients whose DLBP was confirmed by provocative discography and had a pathologic lesion at a single level since disc level is a risk factor for the prognosis [5]; 6) no prominent disc herniation, spinal stenosis, previous lumbar surgery, or other pathologic findings such as fracture, tumor, or infection; 7) patients with intact medical records. 62 cases met these and were included.

2.2. Surgical techniques

2.2.1. Provocative discography

Patients were arranged in lateral position with the affected side upwards under local anesthesia. Positive concordant pain was induced in all patients by provocative discography with or without leakage of contrast media. We don't use methylene blue during discography for it could stain the degenerated discs and surrounding tissues and make illusions for endoscopic procedures.

2.2.2. Working channel insertion

An 18-gauge spinal trocar as the working channel was inserted after foraminotomy utilizing the TOMshidi drill. We only remove part of the abdomen side of the superior articular process to make way for the working channel. Thus, the stability is maintained. The working channel should not reach into AF(Fig. 1b) and could reach the middle of the spinal canal(Fig. 1c). The external diameter of the working channel is 7.3 mm and the endoscope is 6.3 mm (Joimax GmbH, Karlsruhe, Germany).

2.2.3. Intradiscal management

The annulus tear was found in 46 patients. We do not use nipper to drag the herniated disc for this could enlarge the tear. We use forcep to reach into the disc from the tear to release the surrounding tissues and remove the NP and the inflammatory tissues stuck in the tear(Fig. 2a). The arc-shaped bipolar radiofrequency

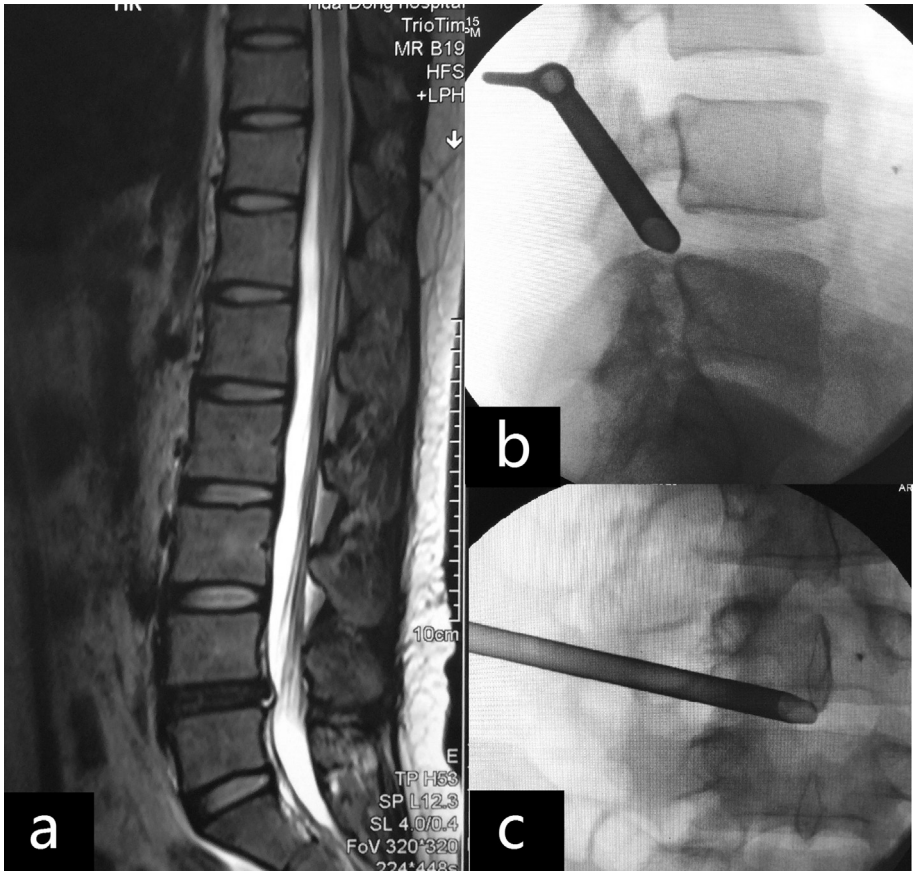

Fig. 1. A 26-year-old female patient with DLBP underwent TESSYS. a Pre-operative MRI manifests disc degeneration at L4/5. **b** Lateral view during the procedure shows the working channel is out of the disc. **c** AP view shows the working channel reaching the middle of the spinal canal.