

# Percutaneous Endoscopic Lumbar Discectomy for Migrated Herniations

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## Introduction

Percutaneous endoscopic lumbar discectomy (PELD) is a spine surgery involving a 7 mm incision under local anesthesia that requires a one-night stay. There are three basic variations of PELD: the transforaminal (TF) approach, which is a method of operating through the intervertebral foramen, the interlaminar (IL) approach, utilizing the interlaminar space, and the extraforaminal (EF) approach for lateral lumbar disk herniation.<sup>1</sup> In conventional surgical procedures for migrated herniation, surgeons in the early stage of the learning curve are more likely to cause complications, such as insufficient hernia removal, epidural space hemorrhage, dura mater injury, and adhesive radiculitis. We have developed novel techniques to avoid these. The migration of lumbar disk hernia (LDH) was classified into four grades: disk-level LDH, slight-migrated LDH, moderate-migrated LDH, and severe-migrated LDH. The “half-and-half technique” of the TF approach was used for disk-level and slight-migrated LDH, in which the tip of a beveled cannula was positioned to equally face both the inside of the intervertebral disk and the epidural space. The inside-out technique was employed to initially remove the nucleus pulposus from the intervertebral disk to depressurize it and then remove the hernia from the epidural space. Although the half-and-half technique was initially performed on moderate-migrated LDH above the L4/5 disk, preparatory foraminoplasty was additionally performed, if required, to remove several millimeters of the superior articular process so as to incorporate the epiduroscopic

technique, which permits introduction of an endoscope into the epidural space.<sup>2</sup> Moderate-migrated LDH from the L5/S level were treated with the IL approach to remove the upper edge of the lamina, followed by partial laminoplasty in which the interlaminar space was enlarged to freely direct the endoscope downward. Severe downward-migrated LDH from the L4/5 to L5/S levels were treated with a method combining the TF approach to resect the upper third of the hernia from the L4/5 level and the IL approach to remove the lower two thirds from the L5/S level.<sup>3</sup>

For severe upward-migrated LDH at the L3/4 and L4/5 levels, we have developed a novel translaminar approach to bore a 9 mm hole in the lamina. The following discusses these applied PELD techniques.

## Materials

### Background of Patients

We performed percutaneous endoscopic lumbar discectomy (PELD) on 1,181 cases of lumbar disk herniation between April 2007 and October 2010. The patients were 320 women and 748 men with an average age of  $48.3 \pm 16.1$ . The patients who received PELD were those not exhibiting much improvement after receiving at least six weeks of conservative treatment, such as block injections, NSAID, and rehabilitation, those having difficulty in moving their bodies due to severe pain, or those clearly exhibiting progressive neurological symptoms who received a definitive diagnosis based on MRI, CT, or functional X-ray. Those with central