

Clinical Video

Modified MIS-PLIF with Percutaneous Pedicles for Lumbar Degenerative Disease

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Posterolateral Fusion (PLF) of the lumbar spine was first introduced by Albee and Hibbs in 1911. Since the introduction of transpedicular screws fixation for lumbar posterolateral fusion by Roy-Camille in the 1970s [1]. It had been used to treat unstable thoracolumbar junction fractures. The procedure was widely indicated for spinal fractures, spinal deformities, spinal tumors, and degenerative diseases. Combined with interbody fusion (PLIF), it could offer 360-degree circumferential stability to the spine [2,3]. However, there are still concerns over an excessive retraction of the nerve roots which may lead to any neurological deficits during the preparation of the cage inserting tract and while inserting the interbody cage or bone graft posterolaterally. Subsequently, Harms and Jeszenszky developed the open Transforaminal Interbody Fusion (TLIF), which act as an alternative to the Posterior Lumbar Interbody Fusion (PLIF) [2,3]. TLIF is known to have less retraction of the thecal sac, allows exposure of the interspace more laterally, and is able to achieve a complete interspace preparation from an unilateral approach [2]. Although it has been a safe and successful method to treat degenerative lumbosacral diseases [4], the stripping of the paravertebral muscles is still required in the open TLIF procedure which may affect postoperative outcome [5,6], such as post-operative pain, and paraspinal muscles atrophy [7,8]. In order to counter the possible unwanted effects from the open TLIF surgery, Holly described the Wiltse posterolateral spinal approach to perform the Minimally Invasive (MIS) TLIF in 2006. The MIS approach is thought essentially preserves the posterior tension band and reduces injury to the paraspinal musculature [9]. Undoubtedly, the approach requires longer learning curves to get familiar with and the procedure needs a specific cylindrical expandable retractor. Hereby, we propose a new alternative method: the Modified MIS-PLIF. It requires a microscope and simple instruments such as Taylor spinal retractor and rubber bands. Then, we perform lumbar decompression through the unilateral midline approach with sublaminar drilling to decompress

the contralateral site, and then fixate the spine with percutaneous transpedicle screws to complete the MIS-TLIF. Because the surgical path is almost the same as microdiscectomy and is familiar to most spine surgeons. We think this procedure is an easy, effective and safe procedure for the lumbar spine degenerative disease. Furthermore, it suits for multilevel decompression or through midline approach.

Video Link: <https://youtu.be/P7S3X409NgM>

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