Objective: To evaluate the clinical outcome and advantages of MI-TLIF (minimally invasive transfominal lumbar interbody fusion) with one cage and pedicle screw system in the treatment of spondylolisthesis and lumbar spinal stenosis by comparing with traditional surgical method (PLIF).

Methods: From August 2009 to June 2010, 26 patients with lumbar spondylolisthesis underwent MI-TLIF (minimally invasive TLIF) with one cage and pedicle screw system While 28 cases of spondylolisthesis underwent traditional PLIF (Posterior Lumbar Interbody Fusion). The two groups were compared by surgical technique, operation time, incision length, outcome, bed time, JOA score and statistical analysis. At the same time, prevention and treatment for surgical complications had been noted, as well as surgical approach selection, was also described.

Results: In TLIF group, mean operation time was 240 ± 36 (210 ~ 340min), bleeding average 360 ± 42ml (300 ~ 600ml), incision length 3 ~ 4cm, bed stay time 5 to 7 days, JOA score before surgery 18, after surgery 24. In traditional PLIF group, mean operative time 220 ± 15 (190 ~ 350min), bleeding average 520 ± 36ml (500 ~ 1000ml), incision length 16 ~ 22cm, bed time 45 ~ 90 days, JOA score score preoperative 17, postoperative 25. In both groups, length of incision, postoperative bed rest time has significant difference (P < 0.05), and postoperative JOA score, operative time has not statistically significant difference (P > 0.05).

Conclusions: MI-TLIF with one cage and pedicle screw system for the treatment of lumbar spondylolisthesis shows great advantage in blood-loss, incision length, bed stay time by comparing with traditional method (PLIF). It is a valuable method of minimally invasive spinal surgery with less paravertebral soft tissue injury, high efficacy and rapid recovery. But it requires a higher surgical techniques and more difficult procedures which was based on traditional surgery experience.