Percutaneous Transforaminal Endoscopic Lumbar Discectomy case series

2023

A study included 47 patients in the TELD group, matched with 47 patients in the conservative group. The disc height of the TELD group at the last follow-up was lower than that at the baseline (P < 0.001), and lower than that of the conservative group at the last follow-up (P < 0.05). The disc degeneration grade of the TELD group at the last follow-up was greater than that at the baseline, and greater than that of the conservative group at the last follow-up. There was no significant difference in the facet joint degeneration in the TELD group between the baseline and the last follow-up, and between the TELD group and the conservative group at the last follow-up (P > 0.05). The pain intensity and disability scores in the TELD group at the 3-month follow-up and the last follow-up were significantly lower than those at the baseline (P < 0.001). Six patients in the TELD group required additional surgery during the follow-up period.

The long-term follow-up data shows that the disc height of the operated level was significantly reduced and the lumbar disc degeneration was significantly aggravated in TELD-treated patients; in contrast, the facet joint degeneration did not show significant aggravation ¹⁾

A retrospective analysis was conducted on 83 patients diagnosed with IDH admitted to our hospital between May 2020 and June 2022. Among these patients, 43 underwent PLIF (PLIF group), while the remaining 40 received PTED treatment (PTED group). Parameters such as operative time, intraoperative bleeding, hospitalization duration, Visual Analogue Score (VAS), and Oswestry Disability Index (ODI) were measured in both groups before and after the procedures. Additionally, 74 IDH patients were randomly assigned to either a research group receiving McKenzie therapy (n = 37) or a control group receiving standard care (n = 37). VAS and ODI scores were recorded pre- and post-intervention in both groups, and lumbar forward flexion joint range of motion (ROM) was assessed.

Results: The PTED group demonstrated shorter operative times, reduced intraoperative bleeding, and shorter hospital stays compared to the PLIF group (P < .05). One month after surgery, no significant differences in VAS and ODI were observed between the PLIF and PTED group patients with Pfirrmann class II-III herniation (P > .05). However, Pfirrmann class IV patients in the PLIF group exhibited lower VAS and ODI scores compared to those in the PTED group (P < .05). Following rehabilitation care, the research group exhibited lower VAS and ODI scores and greater ROM compared to the control group (P < .05).

Conclusions: PTED is characterized by reduced surgical trauma, shorter operative duration, and decreased intraoperative bleeding, while PLIF offers complete removal of the affected disc and stable intervertebral fusion. Integrating McKenzie therapy-based rehabilitation care further enhances lumbar spine function and alleviates pain in patients²⁾.

A retrospective study was conducted on 46 patients (26 men and 20 women; average age 60.8 ±

6.78 years) with symptomatic ASD. The patients were treated with three approaches. The operation time, incision length, time to return to work, complications, and the like were compared among the three groups. Intervertebral disc space height, angular motion, and vertebral slippage were obtained to assess spine biomechanical stability following surgery. The visual analog scale (VAS) score and Oswestry disability index were evaluated at preoperation and 1-week, 3 months, and the latest follow-ups. Clinical global outcomes were also estimated using modified MacNab criteria.

Results: The operation time, incision length, intraoperative blood loss, and time to return to work for the percutaneous transforaminal endoscopic discectomy (PTED) group were significantly decreased compared with those for the other two groups (P < 0.05). The radiological indicators in the CBT-PLIF group and TT-PLIF group had better biomechanical stability compared with those in the PTED groups at the latest follow-up (P < 0.05). The back pain VAS score in the CBT-PLIF group was significantly decreased compared with those in the other two groups at the latest follow-up (P < 0.05). The good-to-excellent rate was 82.35% in the PTED group, 88.89% in the CBT-PLIF group, and 85.00% in the TT-PLIF group. No serious complications were encountered. Two patients experienced dysesthesia in the PTED group; screw malposition was found in one patient in the CBT-PLIF group. One case with a dural matter tear was observed in the TT-PLIF group.

All three approaches can treat patients with symptomatic adjacent segment degeneration efficiently and safely. Functional recovery was more accelerated in the PTED group compared with the other approaches in the short term; CBT-PLIF and TT-PLIF can provide superior biomechanical stability to the lumbosacral spine following decompression compared with PTED; however, compared with TT-PLIF, CBT-PLIF can significantly reduce back pain caused by iatrogenic muscle injury and improve functional recovery. Therefore, superior clinical outcomes were achieved in the cortical bone trajectory screw fixation (CBT-PLIF) group compared with the PTED and TT-PLIF groups in the long term ³⁾.

2022

During a 12-month inclusion period, patients were prospectively included in a single-center case series. Inclusion criteria consisted of sciatica lasting for at least 6 weeks, which was not responsive to conservative treatment. Percutaneous Transforaminal Endoscopic Lumbar Discectomy was performed using dexmedetomidine as sedative and lidocaine as local anesthesia. Measurements included the numeric rating scale (NRS, from 0 to 10) for leg pain, back pain, COMI-back, and NRS for anxiety of anesthesia and perioperative continuously monitored hemodynamics. Furthermore, satisfaction with the sedation was scored by patients, surgeons, and anesthesiologists.

Ninety-two consecutive patients were enrolled. Of all patients, 18.5% had anxiety about undergoing surgery under local anesthesia. All but one patient underwent PTED successfully. There was one case of conversion due to severe, uncontrollable back pain during surgery. Throughout the procedure, hemodynamic parameters showed no clinically relevant change compared to baseline. Anesthesiologic complications were three cases (3.4%) of self-limiting hypoxia and five cases (8.6%) of nausea and/or vomiting. Surgeons and anesthesiologists had a high satisfaction rate (> 87%) with conscious sedation during the procedure, while satisfaction with sedation was scored 8.4 \pm 2.2 by patients.

PTED performed under local anesthesia and conscious sedation is safe and effective to treat sciatica and yields high satisfaction rates from surgeons, anesthesiologists, and patients ⁴⁾

Mahatthanatrakul et al. reviewed patients who underwent TELD. Clinical data obtained were the Oswestry disability index (ODI) and visual analog scale (VAS) for back and leg pain. Residual mass signal and disc protrusion size were measured in postoperative MRI.

Thirty-one patients were reviewed. The mean age was 38.3 ± 14.4 years (range 18 to 76 years). ODI was 18.2% at the first follow-up and 12.7% at the last follow-up (p = 0.009). VAS for back and leg pain were 2.0 and 1.0 without significant change during follow-up. Disc protrusion size was reduced by 67.7% at the 1-year follow-up (p < 0.001). The residual mass signals at postoperative day 1 were high in 12 cases, intermediate in 18 cases, and low in 1 case. The signal intensity was correlated with the percentage of disc protrusion reduction (p = 0.048). The percentage of disc protrusion reduction correlated with the last follow-up ODI (p = 0.018).

One year after TELD, annulus remodeling was observed with an average of 67.7% size reduction. The high signal intensity of residual mass on day 1 correlated with disc protrusion reduction at follow-up MRI. The percentage of disc protrusion reduction associated with the ODI at the final follow-up 5 .

2015

164 patients who were less than 60 years old, complained of unilateral leg pain. Kim et al. measured the maximum trunk shift from the central sacral vertical line (CSVL-max) on preoperative whole spine radiographs and classified the trunk list as CSVL-max \geq 10 mm. CSVL-max was measured on serial radiographs taken at one, 3, 6, and 12 months postoperatively in patients with trunk lists.

Twenty-nine patients (17.9%) had a trunk list (M: F=10:19; mean age, 37.1 ± 11.24 years). Female gender (OR 4.28; 95% CI, 1.49 - 12.3) and HIVD at L4-5 (OR 5.6; 95% CI, 1.8 - 16.7) were risk factors for trunk list. The trunk list was normalized (CSVL-max < 10 mm) in 15 (52%) patients after PELD, and the median time for normalization was 3 - 6 months. Prognostic factors for the recovery of the trunk list were not identified.

Selection bias should be considered in interpreting these results.

Trunk list, scoliosis, or lateral shift, was observed in 18% of the patients at the time of surgery. Female gender and L4-5 disc herniation were risk factors for the trunk list. Trunk list was reversible in more than 50% of patients within 6 months of PELD⁶.

201 patients had endoscopic discectomy and the mean age was 41 years. Male: female ratio was 1.3:1.0. The Mean time of onset of symptoms was 5.5 months and the most common level was L4/5 (53%). All endoscopic discectomies were performed under local anesthesia. Theater time was on average 110 minutes. 10 patients were lost to follow-up. 95% of patients were discharged within 7 hours postoperatively. Visual acuity score of the pain dropped from an average of 7/10 pre-operatively to 0-1/10 in 95% of patients two weeks postoperatively. 87% of patients went back to their normal daily activities within two weeks. There were no cases of Cerebrospinal fluid fistula, hematoma formation, or wound infection. 1% of patients developed a nerve root injury. 6% of patients had recurrent herniation and required microdiscectomy.

Endoscopic discectomy can be an alternative approach to microdiscectomy. While it can take more

expertise to perform endoscopic discectomy, the data shows that the far lateral endoscopic discectomy using the TESSYS technique has comparable outcomes to microdiscectomy ⁷).

A total of 105 patients were included in the study. The patients were retrospectively evaluated for demographic features, lesion levels, numbers of affected levels, visual analog scores (VASs), Oswestry disability questionnaire scale scores, and MacNab pain relief scores.

A total of 48 female and 57 male patients aged between 25 and 64 years (mean: 41.8 years) underwent TLED procedures. The majority (83%) of the cases were operated on at the levels of L4-5 and L5-S1. Five patients had herniations at two levels. There were significant decreases between the preoperative VAS scores collected postoperatively at 6 months (2.3) and those collected after 1 year (2.5). Two patients were referred for microdiscectomy after TLED due to unsatisfactory pain relief on the 1(st) postoperative day. The overall success rate concerning pain relief was 90.4% (95/105). Seven patients with previous histories of open discectomy at the same level reported fair pain relief after TLED.

Transforaminal lumbar endoscopic discectomy is a safe and effective alternative to microdiscectomy that is associated with minor tissue trauma. Herniations that involved single levels and foraminal/extraforaminal localizations were associated with better responses to TLED⁸.

2006

A total of 280 consecutive patients with a primary herniated, including sequestrated, lumbar disc with predominant leg pain, were randomized. A clinical follow-up was performed at 3 months, and at 1 and 2 years after the index operation with an extensive questionnaire, including the visual analog scale for pain and the MacNab criteria. The cohort integrity at 3 months was 100%, at 1 year 96%, and 2 years 92%. RESULTS:

At the 3-month evaluation, only minor complications were registered. At 1 year postoperatively, group 1 (endoscopy alone) had a recurrence rate of 6.9% compared to group 2 (the combination therapy), with a recurrence rate of 1.6%, which was a statistically significant difference in favor of the combination therapy (P = 0045). At the 2-year follow-up, group 1 reported that 85.4% had an excellent or good result, 6.9% had a fair result, and 7.7% were not satisfied. At the 2-year follow-up, group 2 reported that 93.3% had an excellent or good result, 2.5% had a fair result, and 4.2% were not satisfied. This outcome was statistically significant in favor of the group including chymopapain. There were no infections or patients with any form of permanent iatrogenic nerve damage, and no patients had a major complication. CONCLUSIONS:

A high percentage of patient satisfaction could be obtained with a posterior lateral endoscopic discectomy for lumbar disc herniation, and a statistically significant improvement of the results was obtained when an intradiscal injection of 1000 U of chymopapain was added. There was a low recurrence rate with no major complications. The method can be applied to any type of lumbar disc herniation, including the L5-S1 level ⁹.

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