Clinical Outcome of Two-level Percutaneous Pedicle Screw Fixation in Lumbar Degenerative Disease: A Preliminary Report
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Objective: The evolution of minimally invasive techniques should reduce or minimize the destructive aspects of the open techniques but preserve the operative goals of neural decompression and spine fusion. The purpose of this study was to report the clinical experiences for percutaneous posterior fixation of the lumbar spine.

Methods: A total of 24 patients with two-level lumbar degenerative disease underwent neural decompression, discectomy, and interbody cage insertion via small midline incision with percutaneous pedicle screw fixation. Clinical outcome was measured by Odom's criteria, Visual Analogue Scale (VAS), and Oswestry Disability Index (ODI). Operative results were assessed by total operating time, intraoperative blood loss volume, change of total lumbar lordotic angle (TLA) and segmental lordotic angle (SLA), accuracy of pedicle screws, and rate of bone fusion.

Results: “Excellent” or “good” clinical results were obtained in 19 patients (79.2%). VAS scores prior to surgery to alleviate back and leg pain were 6.67 and 7.17 and 4.75 and 5.00 immediately postoperative and 3.83 and 3.63 at the last follow-up visit, respectively. Preoperative ODI was 66.08%. ODI was 51.83% immediately postoperative and 35.54% at the last follow-up visit. The total procedure required a mean of 4.17 hours. Estimated blood loss was 521ml, and transfusion was needed in 4 patients during the surgery. There was no statistical significance in the change of TLA and SLA for the preoperative, postoperative, and follow-up period, and the bone fusion rate was 91.6%. Of the 144 screws placed, 6(4%) screws were malpositioned, and two cases involved performing a conventional, open procedure in the earlier stage, since it was difficult to insert screws, due to their pedicle alignment.

Conclusion: Two-level percutaneous pedicle screw fixation can be safely and effectively performed using minimally invasive techniques, thereby reducing pain, operating time, and blood loss. Pedicle alignment is a critical factor in multilevel percutaneous pedicle screw fixation.