

Minimally Invasive Pedicle Screws Used in the Treatment of Lumbar Spinal Disorders.

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Background Context:

Minimally invasive spine surgery (MIS) has gained popularity in recent years. The interest in MIS is due to technological advances and the recognition of the trauma during open surgery (i.e. muscle stripping). There are a small number of MIS systems that have the capability to impart screw and rod fixation into the pedicles of the lumbar spine.

Purpose:

This study examines the use of one of these systems for the treatment of lumbar spine disorders.

Study Design/Setting:

Post-operative retrospective analysis of patients being treated for degenerative disc disease with a minimally invasive pedicle screw system.

Patient Sample: n=70

Outcome Measures:

Blood loss, days in hospital, operative time, intra-operative complications, in-patient post-operative complications were evaluated using univariate analysis of variance with the effects of number of levels and surgical approach.

Methods:

We conducted a multi-center retrospective chart review of seventy (70) patients receiving minimally invasive pedicle screws for the treatment of lumbar spine disorders. These patients had various interbody implants placed both anteriorly (n=30, 42.9 %) and posteriorly (n=40, 57.1%). The posterior surgeries were done using either TLIF (n=23, 57.5%) or PLIF (n=17, 42.5%) exposures. This study group consisted of 39 males and 31 females.

Results:

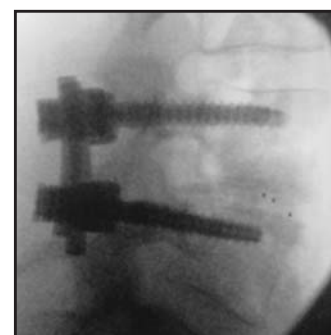
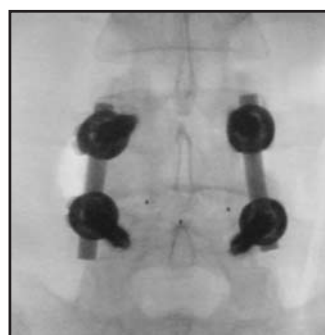
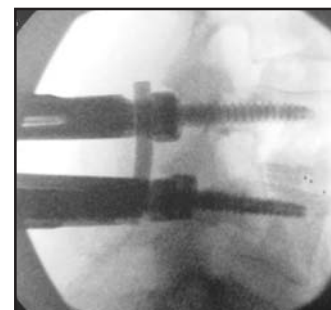
Operative time was significantly less in one level cases than two level cases, 167 vs. 251 minutes. The operative time for the TLIF procedure was longer than ALIF and PLIF procedures. Pedicle screw implant time was greater for 2 level procedures than one level, (87 min vs. 60 min). Screw implant time for the 360° was greater than the PLIF or TLIF. Hospital stay was not affected by the number of levels or surgical approach. The TLIF approach demonstrated less blood loss than the 360° or PLIF procedures, independent of the number of levels.

Three (3) of the seven (7) intraoperative complications that occurred were directly related to the pedicle screws. Two (2) of the three (3) complications involved

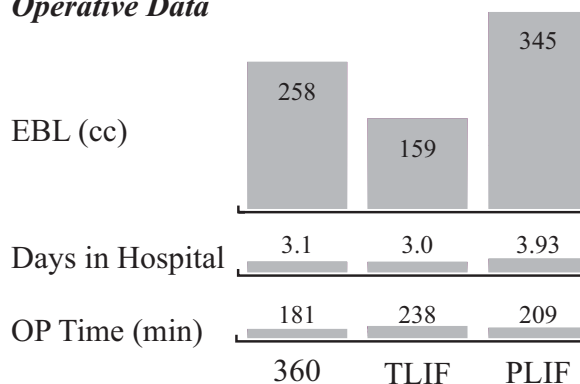
intraoperative screw misplacement; another involved migration of the interbody device after screw placement.

Conclusions:

Minimally invasive one- and two-level instrumentation was readily achieved via both anterior and posterior interbody fusions at numerous centers with short surgical times, low blood loss and minimal perioperative hardware complications.



Operative Data



Approach	N=	Op Time (min)	EBL (cc)	Screw Implant Time (min)	Days in Hospital
360	30	181 (SD, 10)	258 (SD, 29)	89 (SD, 6)	3.1
PLIF	17	209 (SD, 17)	345 (SD, 79)	60 (SD, 10)	3.93
TLIF	23	238 (SD, 7)	159 (SD, 35)	71 (SD, 4)	3.0