



Does the Use of Minimally Invasive Pedicle Pedicle Screw Fixation Lower the Rate of PJK and Reoperation for PJF?



Paul Park MD; Praveen V. Mummaneni MD; Gregory Mundis MD; Neel Anand MD; Pierce D. Nunley MD; Juan S. Uribe MD; Michael Y. Wang MD FACS; Adam S. Kanter MD; David O. Okonkwo MD, PhD; Richard G. Fessler MD; Vedat Deviren MD; Stacie Nguyen MPH; Christopher I. Shaffrey MD, FACS; Kai-Ming G. Fu MD PhD; International Spine Study Group

Introduction

Disruption of the paraspinal muscles and joints may contribute to PJK. Use of minimally invasive (MIS) pedicle screw fixation has been theorized to lower the PJK rate by reducing paraspinal soft tissue injury. The purpose of this study was to compare rates of PJK and reoperations for PJF in a propensity matched patient cohorts who had posterior minimally invasive (MIS) versus open pedicle screw placement to correct moderate degrees of adult deformity.

Methods

Two multi-center databases were queried. Inclusion criteria for the databases were age >18 yrs and one of the following criteria: coronal scoliosis =20°, SVA >5cm, PT >25°, or thoracic kyphosis >60°. Patients were categorized into 3 groups by surgical approach. The MIS group were those who had lateral interbody fusion (LIF) and/or MIS TLIF with posterior percutaneous instrumentation. Hybrid (HYB) group were those who had LIF followed by open posterior instrumentation. Open (OPEN) group were those who had a traditional posterior exposure for screw placement +/- osteotomies. Patients were propensity matched for SVA, PI-LL mismatch, and levels fused. 114 patients were included with 38 in each group. All patients had 2 year minimum follow-up. PJK was defined as proximal junctional angle >10° and change post-op >10°.

Results

Mean age was 60.8(MIS), 62.4(HYB), and 53.5(OPEN)yrs (p=0.018). Pre-op SVA and PI-LL were similar and remained so at 2 year follow-up (Table 1). Mean levels fused were 4.7(MIS), 5.4(HYB), 6.8(OPEN) (p=0.002). Radiographic PJK rates were similar. However, 0(0%) cases in MIS vs 6(15.8%) in HYB (p=0.01) and vs 3(7.9%) in OPEN (p=0.07) required re-operation. Mean PJK angle in these patients were 21.3° for HYB and 23.1° for OPEN.

Conclusions

In this comparative study, MIS pedicle screw fixation resulted in a similar rate of radiographic PJK in patients who were propensity matched for SVA and PI-LL mismatch (pre-op SVA<5cm, PI-LL of 10-20 degrees) and levels fused. There was a trend toward MIS cases requiring less reoperation for PJK.

Learning Objectives

To access the PJK and PJF rates between different surgical techniques in treating adult spinal deformity