



## Re-operation Rates in Minimally Invasive, Hybrid and Open Surgical Treatment for Adult Spinal Deformity with Minimum 2-Year Follow-up.

Adam S. Kanter MD; Gregory Mundis MD; Praveen V. Mummaneni MD; Neel Anand MD; Richard G. Fessler MD; Peter G Passias MD; Paul Park MD; Frank La Marca MD; Juan S. Uribe MD; Michael Y. Wang MD FACS; Behrooz A. Akbarnia MD; Christopher I. Shaffrey MD, FACS; Stacie Nguyen MPH; David O. Okonkwo MD, PhD; International Spine Study Group



### Introduction

Minimally invasive surgical (MIS) techniques are gaining popularity in the treatment of ASD with the premise of equivalency in outcomes and complication reduction. Potential limitations to MIS techniques are decreased corrective capacity, concern for long-term efficacy, and potential need for revision surgery. The current study aims to compare re-operation rate and indications following MIS, hybrid and open surgery for ASD.

### Methods

Two multi-center databases were retrospectively analyzed . Inclusion criteria: age >18 years with minimum 20° coronal lumbar Cobb, minimum 3 levels fused and 2 year follow-up. Patients were propensity matched for preop SVA, PI-LL, and levels fused, resulting in 114 patients in three subgroups of 38 patients: (1) MIS: lateral or transforaminal lumbar interbody fusion (LIF) and percutaneous pedicle instrumentation, (2) Hybrid: MIS LIF with open posterior segmental fixation (PSF), and (3) Open: PSF +/- osteotomies.

### Conclusions

Re-operation rates were not statistically different between the MIS, Hybrid, and Open surgical groups, however the incidence was twice as high in Hybrid and Open groups. The most common reasons for reoperation were PJK, neuro deficit, and infection for the hybrid and open groups, but pseudarthrosis in the MIS group.

### Learning Objectives

By the conclusion of this session participants will be able to discuss re-operation rates between three different surgical techniques for adult spinal deformity.

### Results

There were no significant differences between groups in pre-op SVA or PI-LL ( $p>0.05$ ), however the MIS group had significantly fewer levels fused (4.7) than the open group (6.8) ( $p=0.002$ ). The rate of revision surgery was not significantly different between the groups ( $p=0.196$ ): MIS=15.8% (6/38), Hybrid=31.6% (12/38), Open=31.6% (12/38). The most common reason for reoperation in the Open group was neuro deficit (10.5%) followed by PJK (7.9%). The most common reason in the Hybrid group was PJK (13.2%) followed by infection (7.9%). The most common reason in the MIS group was pseudarthrosis (7.9%).