



Peak Timing and Associated Risk Factors for Specific Complications Following Adult Spinal Deformity (ASD) are Identifiable; A Guide for Surgeons and Patients

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Introduction

ASD surgery complication rates rank the highest of surgical specialties. Total complication rates have been reported, however little data exists for the timing and risk factors associated with specific complications. Purpose: evaluate the peak timing and risk factors for specific complications in a prospective, consecutive ASD cohort at minimum 2yr follow-up.

Methods

Prospective analysis of complications following ASD surgery. Inclusion criteria: ASD, age = 18yrs, spinal fusion =4 levels, and minimum 2yr follow up. Complications divided into major and minor, then further divided into operative, implant failure, infectious, neurological, proximal junctional kyphosis (PJK), return to OR, and wound complications. Peak timing of complications identified and rank order best fit modeling for complication risk factors created using multivariate analysis (MARS) at delineated time points (T=0, <3, 3-6, 6-12, 12-24 and >24 months).

Results

199 patients, mean follow-up 44.3 months (range 23.3-60.3) met inclusion criteria. There were 350 total complications (214 minor, 136 major). Minor complications peaked at t<3 months, major complications had bi-modal peaks at T=0 and 12-24 months. Neurological complications and PJK had bimodal peaks at <3 and 12-24 and <3 and 6-12 months, respectively. Implant failures peaked at >24 months. Rank order best fit MARS variables for major complications at T=0 was rhBMP-2 interbody dose/level, BMI and EBL, and at 12-24 months was SVA. MARS risk factors for minor complications at <3 months were rhBMP-2 posterior dose/level, EBL, total posterior fusion levels, and maximal scoliosis. The only risk factor for neurological complications at <3 months was total osteotomies; no risk factors were identified at 12-24 months. Risk factors for implant failures at >24 months were 3-column osteotomies, SVA and EBL.

Conclusions

Risk factors for the peak timing of specific complications following ASD surgery are identifiable. Surgeons should be aware of complication timing and risk factors to improve patient care.

Learning Objectives

By the conclusion of this session, participants should be able to:

- 1) Identify the peak timing of major and minor complications following ASD surgery and 2) identify risk factors for complications