Predicting 30-day Perioperative Outcomes in Adult Spinal Deformity (ASD) Patients with Baseline Paralysis or Functional Dependence

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Disclosures

- No relevant disclosures
- All disclosures can be found on http://www7.aaos.org/education/disclosure/search
Introduction

• Patients undergoing surgical treatment of adult spinal deformity (ASD) are often preoperatively risk stratified using standardized instruments to assess for perioperative complications

• Many ASD instruments account for medical comorbidity and radiographic parameters, but few consider a patient’s ability to independently accomplish necessary activities of daily living (ADLs)
Methods

- Patients ≥18 years undergoing ASD-corrective surgery were identified in NSQIP.
- Patients were grouped by 1) plegic status and 2) dependence in completing ADLs [“totally dependent”=requires total assistance in ADLs, “partially dependent”=uses prosthetics/devices but still requires help, “independent”=requires no help].
- Quadriplegics and totally dependent patients comprised “Severe functional dependence,” paraplegics/hemiplegics who are “partially dependent” comprised “Moderate functional dependence”, and “Independent” non-plegics comprised “Independent.”
- ANOVA with post-hoc testing and Kruskal-Wallis tests compared demographics and perioperative outcomes across groups.
- Logistic regression found predictors of inferior outcomes, controlling for age, sex, BMI, and invasiveness.
- Subanalysis correlated functional dependence with other established metrics such as the modified frailty index (mFI) and Charlson Comorbidity Index (CCI).
Results

- 40,990 ASD patients were included (57.1 years, 53% female, 29.8kg/m\(^2\))
- Mean invasiveness score 6.9±4.0. 95.2% were Independent (Indep), 4.3% Moderate (Mod), and 0.5% Severe (Sev).
- Sev had higher baseline invasiveness than Mod or Indep groups (9.0,8.3,6.8, respectively,p<0.001).
Results

• Compared to the Indep patients, Sev and Mod had significantly longer inpatient LOS (10.9d, 8.4d, 3.8d, \( p<0.001 \)), higher rates of SSI (2.2%, 2.9%, 1.5%, \( p<0.001 \)), and more never events (17.7%, 9.9%, 4.0%, \( p<0.001 \)).

• Mod had higher readmission rates than either Sev or Indep groups (30.2%, 2.7%, 10.3%, \( p<0.001 \)).

• No differences in implant failure were observed (\( p>0.05 \)).
Results:

- Controlling for age, sex, BMI, CCI, invasiveness, and frailty, regression equations showed increasing functional dependence significantly increased odds of never events (OR: 1.82 [1.57-2.10], p<0.001), specifically UTI (OR: 2.03 [1.66-2.50], p<0.001) and DVT (OR: 2.04 [1.61-2.57], p<0.001).

- Increasing functional dependence also predicted longer LOS (OR: 3.16 [2.85-3.46], p<0.001) and readmission (OR: 2.73 [2.47-3.02], p<0.001).

- Subanalysis showed functional dependence correlated more strongly with mFI (r=0.270, p<0.001) than mCCI (r=0.108, p<0.001), while mFI and mCCI correlated most with one another (r=0.346, p<0.001).
Conclusions

• Severe functional dependence had significantly longer LOS and more never-event complications than Moderate or Independent groups.

• Overall, functional dependence may show superiority to traditional metrics in predicting poor perioperative outcomes such as increased LOS, readmission rate, and risk of surgical site infection and never-events.