

Longer Constructs, a Good Summit lowered likelihood of PJK (OR: 0.3, [0.1-0.9]; $p=0.27$). Good Base led to zero occurrences of PJF. In patients with severe frailty/osteoporosis, a Good Summit lowered incidence of PJK (OR: 0.4, [0.2-0.9]; $p=0.41$) and PJF (OR: 0.1, [0.01-0.99]; $p=0.49$).

CONCLUSIONS: To mitigate junctional failure, our study demonstrated the utility of individualizing surgical approaches to emphasize an optimal basal construct. Achievement of tailored goals at the cranial end of the surgical construct may be equally important, especially for higher risk patients with longer fusions.

FDA DEVICE/DRUG STATUS: This abstract does not discuss or include any applicable devices or drugs.

<https://doi.org/10.1016/j.spinee.2023.06.064>

12. Mobile device-based surface topography is a better predictor of spinal deformity than scoliometer

Yousi Oquendo, MD, MSc¹, Taylor Harris, BS², Xochitl Bryson, BA³, Joanna Langner, MS⁴, Michael Gardner, MD⁵, Kali R. Tileston, MD⁶, Ann Richey, BA⁷, Nadine Javier, BS⁷, John S. Vorhies, MD⁸; ¹Hospital for Special Surgery, New York, NY, US; ²Stanford Medical School, Stanford, CA, US; ³Stanford University School of Medicine, Palo Alto, California, US; ⁴Lafayette, CA, US; ⁵Stanford Medicine, Menlo Park, CA, US; ⁶Stanford, CA, US; ⁷Palo Alto, CA, US; ⁸Stanford University Dept of Orthopaedic Surgery, Palo Alto, CA, US

BACKGROUND CONTEXT: Nonradiographic screening and diagnosis in adolescent idiopathic scoliosis (AIS) currently relies on scoliometer. We hypothesized that white-light based 3D scanning could generate high quality 3D representations of surface anatomy using a mobile device and would provide better deformity assessments compared to scoliometers.

PURPOSE: We hypothesized that WL3D would provide better deformity assessments compared to scoliometers.

STUDY DESIGN/SETTING: Cross-sectional, single center study.

PATIENT SAMPLE: Ten- to 18-year-olds presenting to an outpatient pediatric orthopedic clinic with scoliosis radiographs within 30 days of the visit for evaluation of AIS.

OUTCOME MEASURES: 3D scan identified spinal deformity.

METHODS: Patients 10- to 18-years-old presenting to an outpatient pediatric orthopedic clinic with scoliosis radiographs within 30 days of the visit for evaluation of AIS were approached for the study. 3D scans were taken in the upright and forward bend positions. Image processing software was used to make 3D measurements of trunk shift (TS), coronal balance (CB), and clavicle angle (CL) in upright position and largest angle of trunk rotation (ATR) as detected in the lumbar and thoracic spine in bending position. 3D trunk shift, coronal balance, and clavicle angle were compared to their analogous radiographic measurements. 3D ATR and ATR as measured by a scoliometer (SM) were correlated to major curve magnitude (MCM). Multivariable regressions models were created to predict likelihood of coronal Cobb angle > 20 based on BMI and 3D measurements vs BMI and scoliometer. Model fit was compared using Akaike information criterion (AIC).

RESULTS: A total of 312 visits representing 258 patients were included. Mean age was 13.7 years, mean coronal MCM was 19.8+/- 13.0° for lumbar curves and 22.1+/-15.3° for thoracic curves. There was a significant correlation between 3D and radiographic CL ($r=0.65$), TS ($r=0.8$), and CB ($r=0.8$) ($p < 0.001$) including 3D data outperformed a model based on scoliometer data (AIC=206 vs 237).

CONCLUSIONS: Mobile device-based 3D scanning identifies clinically relevant scoliotic deformity and is a better predictor of major curve magnitude than scoliometer measurements.

FDA DEVICE/DRUG STATUS: This abstract does not discuss or include any applicable devices or drugs.

<https://doi.org/10.1016/j.spinee.2023.06.065>

13. A prospective, observational, multicenter study assessing functional improvements after multilevel fusion for adult spinal deformity: 5-year follow-up results

Hananel Shear Yashuv, MD¹, Stephen Lewis, MD², Yukihiko Matsuyama, MD, PhD³, Jonathan Sembrano, MD⁴, Yong Qiu, MD⁵, Christopher Shaffrey, MD⁶, Kenneth Cheung, MD, FRCS⁷, Maarten Spruit, MD, PhD⁸, David Polly, MD⁴, Ahmet Alanay, MD⁹, Michael Kelly, MD¹⁰;

¹Department of Orthopaedic, Hadassah Medical Center, Hebrew University, Jerusalem, Israel, Jerusalem, IL; ²Toronto Western Hospital, Toronto, ON, CA; ³Department of Orthopaedic Surgery, Hamamatsu University School of Medicine, Shizuoka, JP; ⁴University of Minnesota, Minneapolis, MN, US; ⁵The Affiliated Drum Tower Hospital of Nanjing University Medical School, Nanjing, CN; ⁶Duke University Medical Center, Durham, NC, US; ⁷Queen Mary Hospital, Hong Kong, HK; ⁸St. Maartenskliniek, Nijmegen, NL; ⁹Alanay Saglik, Istanbul, TR; ¹⁰Rady Children's Hospital, San Diego, CA, US

BACKGROUND CONTEXT: Increasing numbers of patients are undergoing surgical treatment for adult spinal deformity (ASD). The main indications are pain, disability and loss of function. Multiple patient-reported health-related quality of life (HRQOL) measures are utilized to assess functional status and disability before and after surgery. Some components of these questionnaires may be more pertinent in the elderly population.

PURPOSE: Our primary aim was to assess which key functional outcomes were most impacted by multilevel fusion surgery for ASD. Our secondary aim was to assess if these functional improvements were maintained over the follow-up period

STUDY DESIGN/SETTING: Prospective observational multicenter cohort study

PATIENT SAMPLE: Patients ≥ 60 years of age from 12 international centres undergoing spinal fusion of >5 levels were included.

OUTCOME MEASURES: Function was assessed using the Scoliosis Research Society 22r (SRS22r) function domain, and with the personal care, walking, sitting and standing sections from the Oswestry Disability Index (ODI) and EQ-5D-3L scores

METHODS: Patients ≥ 60 years of age from 12 international centres undergoing spinal fusion of >5 levels were included. Follow-up visits were performed at 10 weeks, 12 months, 24 months and 60 months. Statistical analysis was performed on the specific functions to assess the outcome of specific functions at different time intervals.

RESULTS: A total of 219 patients (80.4% females) were included with a mean age of 67.5 years. The mean preoperative SRS-22r function scores were 2.71 (95% CI: 2.61; 2.80) which improved to 3.46 (3.35; 3.57) by 2 years postsurgery and were sustained at 5 years (3.40 [3.27; 3.53]). 44.9% of patients were either bedbound or had primarily no activity before the surgery which reduced to 18.1% at 2 years and 17.1% at 5-year follow-up. Similarly, the percentage of patients that could stand >30 minutes improved from 24.3% to 67.8% at 2 years and was 59.0% at 5 years. 25.7% of patients could walk for a mile or more before surgery, which improved to 62.7% at 2 years and was 57.3% at 5 years. 42.6% had unlimited sitting preoperatively, that improved to 65.0% at 2 years and 64.2% at 5 years. Normal social life was seen in 18.8% of patients at baseline compared to 56.0% at 2 years and 50.4% at 5 years.

CONCLUSIONS: This study provides quantifiable information regarding practical functional improvements seen in patients ≥ 60 years of age undergoing multilevel spinal fusions for ASD. Specifically, at 5 years postop, about 60% of patients can expect to stand more than 30 minutes, walk more than a mile and enjoy unlimited sitting, while 50% can enjoy a normal social life.

FDA DEVICE/DRUG STATUS: This abstract does not discuss or include any applicable devices or drugs.

<https://doi.org/10.1016/j.spinee.2023.06.066>