Effect of Upper Instrumented Vertebra (UIV) On Adult Spinal Deformity (ASD) Correction, Maintenance of Correction, and Health Related Quality of Life (HRQOL) Following Lumbar Pedicle Subtraction Osteotomy

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Introduction

Lumbar PSO (LPSO) is frequently used to correct sagittal spino-pelvic malalignment (SSM), however, proximal junctional kyphosis (PJK) and unfavorable reciprocal changes in the unfused thoracic spine may lead to poor postoperative sagittal alignment and loss of correction.

Purpose

Evaluate maintenance of sagittal spino-pelvic correction following LPSO based upon upper instrumented vertebra in upper thoracic (UT) vs thoracolumbar (TL) regions.

Results

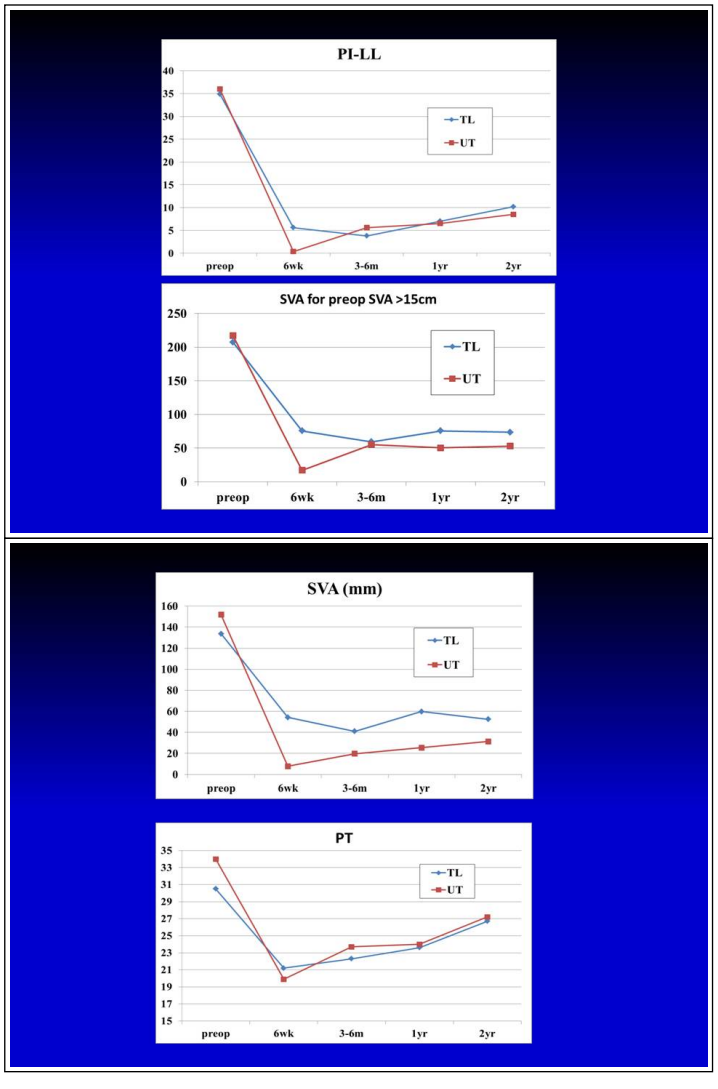
- 328 ASD patients met inclusion criteria
- UT and TL had similar preop SVA and pelvic incidence/lumbar lordosis (Pi/LL) mismatch
- UT had greater preop pelvic tilt (PT 33.4; p=.048)
- UT had lower SVA than TL at 6 weeks postop (11mm vs 54mm; p<0.05),
- However, beyond 6 weeks postop, all sagittal radiographic parameters were similar UT vs TL

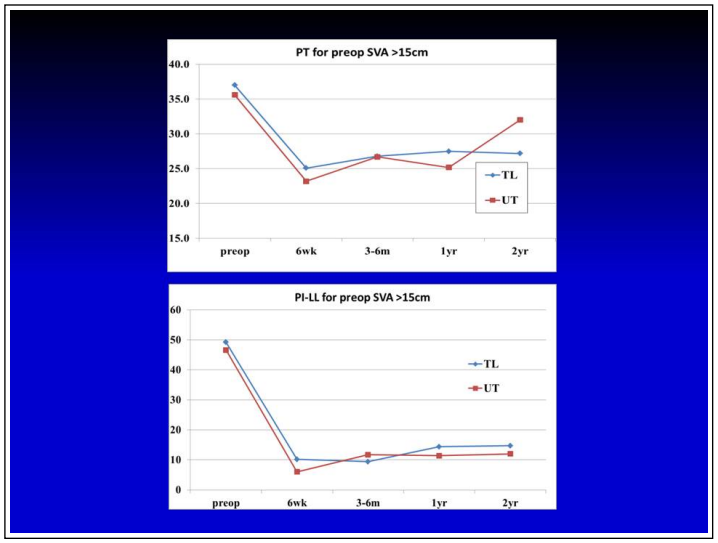
Methods

1) Retrospective evaluation of ASD patients enrolled into a multicenter spinal osteotomy database.
2) Inclusion Criteria:
   - LPSO for SSM and distal fusion to the pelvis
   - Radiographic and health related quality of life (HRQOL)_ evaluation timepoints to include: preoperative and 6week, 3 month, 6 month, 1year and 2year postoperative
3) Subjects stratified by UIV (UT vs TL)
4) Sagittal alignment correction and correction maintenance evaluated and correlated with HRQOL values
5) Subanalysis performed for correction maintenance for patients with very high SVA >15cm

Results cont'd

- UT and TL maintained similar sagittal correction through 2 years
- UT and TL initially maintained threshold criteria for good sagittal alignment (SVA<5cm, PT<25, PI-LL <11)
- However, mean TL SVA was >5cm at 1yr (5.3cm)
- HRQOL values were similar for UT vs TL for all timepoints except SRS-22 at 6 weeks (3.4 vs 2.6) and VAS at 1yr (5.2 vs 3.1)





Conclusions

Analysis of UIV location for LPSO procedures demonstrated UT and TL achieve and maintain acceptable sagittal correction, however, UT maintained better SVA correction (<5cm) than TL at 2 year postop. Both groups demonstrated loss of initial PT correction at 2 years postop. Long term evaluation will determine if these differences impact HRQOL values, complication and revision rates.

Learning Objectives

By the conclusion of this presentation, participants should: 1) understand that UIV in upper thoracic spine (UT; T2-T5) had better early sagittal alignment, better maintenance of sagittal correction and better maintenance of sagittal vertical axis <5cm than patients with UIV in the thoracolumbar (TL; T9-L1) region at 2 year follow up and 2) be aware that HRQOL scores were the same between UIV in upper thoracic spine and UIV in the thoracolumbar.