

Online Resource 1

Residual L4 Tilt and Five-Year Self-Image After L3 Fusion for Adolescent-Onset Idiopathic Scoliosis

Table S1. Age as a Secondary Modifier of L4/L5 Change

Segment	Interval	n	Adjusted β per 5-y age	95% CI	P
L4	Preoperative to 1 week	85	+0.128	-3.018 to +3.275	.936
L4	1 week to 2 years	84	-0.085	-0.670 to +0.499	.772
L4	2 to 5 years	81	+0.005	-0.370 to +0.380	.979
L4	1 week to 5 years	81	-0.112	-0.647 to +0.423	.679
L5	Preoperative to 1 week	85	+0.289	-0.966 to +1.543	.648
L5	1 week to 2 years	84	-0.003	-0.366 to +0.360	.986
L5	2 to 5 years	81	+0.185	-0.765 to +1.135	.700
L5	1 week to 5 years	81	+0.200	-0.516 to +0.917	.579

Models used HC3 robust standard errors and adjusted for baseline segment tilt, preoperative main Cobb angle, Lenke type, and center. Positive β denotes less leveling or more residual tilt with older age.

Table S2. Correlations Between 5-Year Radiographic Markers and Self-Image

Radiographic marker	n	Spearman ρ	P	FDR q
L4 tilt	78	-0.405	<.001	.008
L5 tilt	78	-0.285	.011	.100
LIV tilt	78	-0.308	.006	.070
L3/4 disc wedge	67	0.021	.864	.945
Residual main Cobb	78	-0.342	.002	.038
Clavicle angle	78	0.104	.364	.637
C7–CSVL offset	78	-0.020	.861	.945

False-discovery-rate q values were calculated across 35 radiograph-by-PROM correlations. The primary L4 tilt–Self-image association had a bootstrap 95% CI of -0.585 to -0.192 .

Table S3. LIV Tilt and Distal L4/L5 Correction

Analysis	Segment	LIV exposure (per 5°)	n	Adjusted β	95% CI	P	Std. β	ΔR^2	Outcome interpretation
Early correction	L4	Greater LIV correction	85	+1.99	+1.02 to +2.95	<.001	+0.397	0.048	Greater initial leveling
Early correction	L5	Greater LIV correction	85	+0.95	+0.14 to +1.75	.022	+0.286	0.025	Greater initial leveling
Prospective late alignment	L4	Greater 1-week LIV tilt	81	+0.60	-0.29 to +1.48	.183	+0.095	0.005	Greater 5-year residual tilt
Prospective late alignment	L5	Greater 1-week LIV tilt	81	+0.82	-0.27 to +1.91	.139	+0.153	0.015	Greater 5-year residual tilt

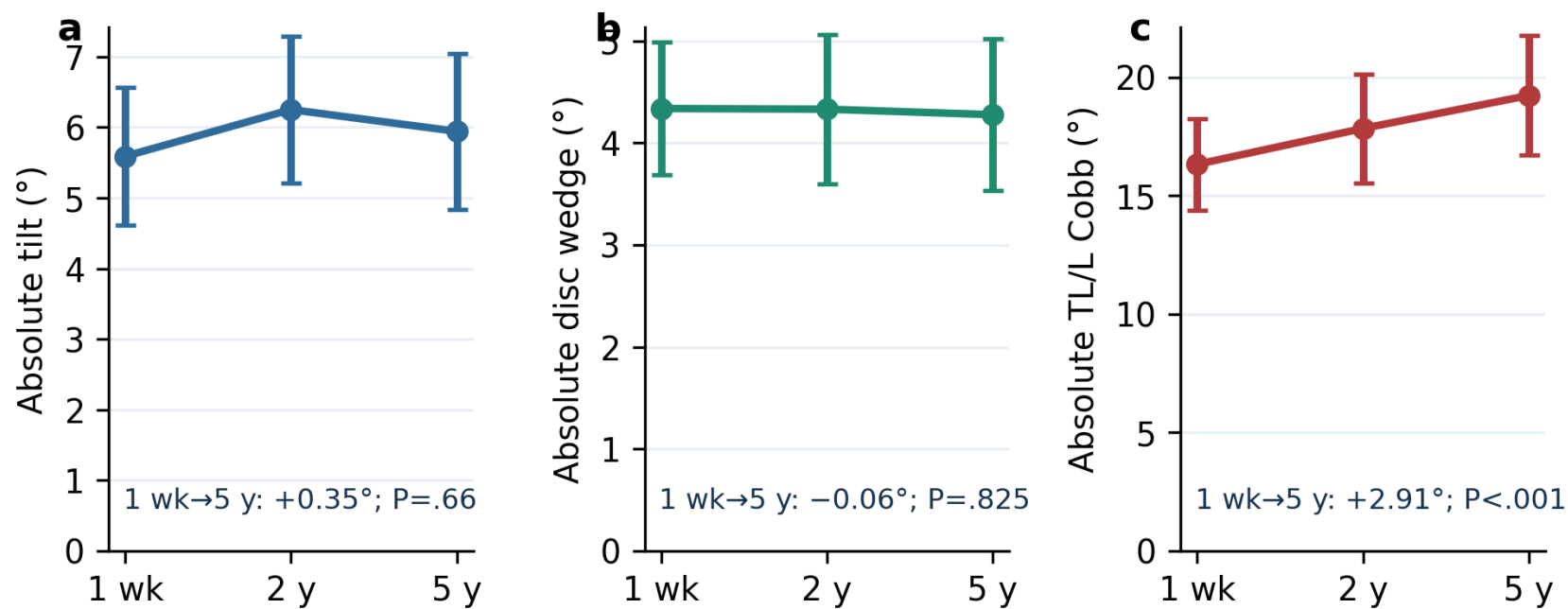
Positive early-correction coefficients indicate greater distal leveling. Positive prospective coefficients indicate greater 5-year residual tilt. Early models adjusted for preoperative segment and LIV tilt, preoperative main Cobb angle, main-curve correction, age, Lenke type, and center. Prospective models adjusted for 1-week segment tilt and main Cobb angle, age, Lenke type, and center. HC3 robust standard errors were used. Correction amount and residual 1-week LIV tilt were not entered together because, conditional on preoperative LIV tilt, they are algebraically complementary.

Table S4. Concurrent Correlates of 1-Week-to-5-Year L5 Tilt Change

Concurrent marker change	n	Spearman ρ	P	Adjusted β per 1°	95% CI	P	FDR q
L4 tilt	81	+0.277	.012	+0.401	+0.225 to +0.578	<.001	<.001
LIV tilt	81	+0.189	.091	+0.213	+0.034 to +0.391	.020	.081
TL/L Cobb	81	+0.077	.494	+0.099	-0.056 to +0.254	.207	.505
main Cobb	81	+0.014	.903	+0.098	-0.071 to +0.267	.252	.505
L3/4 disc wedge	70	+0.021	.863	+0.122	-0.133 to +0.376	.343	.545
clavicle angle	80	+0.149	.188	-0.082	-0.538 to +0.373	.720	.720
C7-CSVL offset	81	+0.196	.080	+0.165	-0.231 to +0.560	.409	.545
pelvic obliquity	40	+0.181	.263	+0.328	-1.079 to +1.735	.639	.720

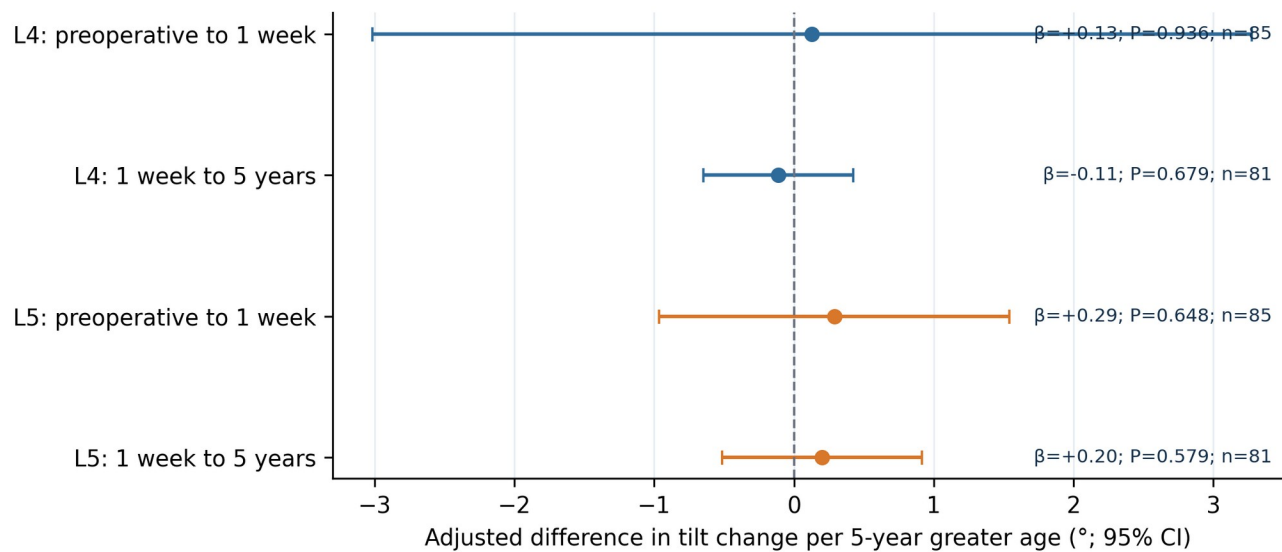
Positive L5 change indicates increasing residual tilt; negative change indicates leveling. Each HC3-robust model adjusted for the 1-week L5 and marker magnitude, age, Lenke type, and center. False-discovery-rate q values were calculated across all eight marker models. The pelvic-obliquity analysis was limited to 40 complete trajectories.

Figure S1. LIV Tilt, L3/4 Disc Wedge, and TL/L Cobb



Mean absolute LIV (L3) tilt, L3/4 disc wedge, and TL/L Cobb magnitude with 95% confidence intervals at 1 week, 2 years, and 5 years. The stable subjacent disc and increasing TL/L Cobb contrast with the modest L5 leveling shown in Fig. 2a.

Figure S2. Secondary Age Analysis



Models adjusted for baseline tilt, preoperative main Cobb angle, Lenke type, and center. Positive values indicate less leveling or greater residual tilt.

Adjusted age coefficients for initial correction and late L4/L5 change. Models include baseline tilt, preoperative main Cobb angle, Lenke type, and center.