Surgery for Idiopathic Scoliosis in Adolescents versus Young Adults: A Matched Cohort Analysis

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Introduction

It is unknown if outcomes differ between adolescents and young adults with idiopathic scoliosis (IS) when extent of surgery (i.e. instrumented levels) is similar. We compared adolescents versus young adults matched for instrumented/fused levels.

Methods

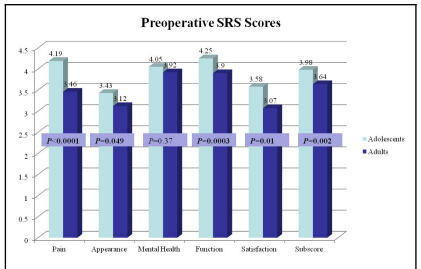
Two groups of 59 patients with IS [adolescents 10-18 ("AIS") vs young adults 19-39 ("YAIS")] were matched from a prospectively-enrolled database 1:1 on the basis of gender (76% females in each group) and instrumented levels (mean 10.9 levels in each). Only posterior-only, pedicle screw constructs ending at/above L5 were included. Operative data, radiographs, complications, and SRS-30 scores were compared at preop, 2-yr postop, and final f/u (3.67 yrs AIS, 3.61 yrs YAIS).

	Group		
	AIS (n=59)	YAdIS (n=59)	*P*-value*
Age at surgery (yr)	15.0 ± 2	25.6 ± 7	n/a
Female gender	45 (76%)	45 (76%)	1.0
Height (m)	1.60 ± 0.12	1.68 ± 0.08	**0.0006†**
Weight (kg)	53.8 ± 1	65.0 ± 14	**<0.0001†**
Vertebrae fused	11 ± 2	11 ± 2	0.99†
Length of Surgery (min)	274 ± 55	280 ± 58	0.92†
Estimated Blood Loss	534 ± 270	605 ± 398	0.63†

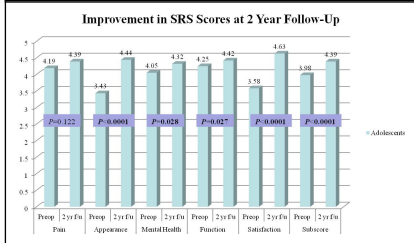
		Group		
		AIS (n=59)	YAdIS (n=59)	*P*-value*
UT Cobb (degrees)	Preop	26.7 ± 13.0	26.4 ± 11.1	0.91
	2 yr postop	14.7 ± 8.6	17.5 ± 9.0	0.08
	Final f/u	14.6 ± 10.8	21.7 ± 9.8	0.06
MT Cobb (degrees)	Preop	56.2 ± 14.7	50.4 ± 14.5	**0.03**
	2 yr postop	20.4 ± 9.6	23.9 ± 11.9	**0.0003**
	Final f/u	17.8 ± 11.4	29.4 ± 12.1	0.06
TL/L Cobb (degrees)	Preop	38.8 ± 13.2	38.7 ± 12.5	0.95
	2 yr postop	13.4 ± 9.2	18.3 ± 11.4	**0.01**
	Final f/u	9.7 ± 7.7	21.7 ± 14.1	**0.04**
Coronal balance (mm)	Preop	20.2 ± 14.7	14.5 ± 11.3	**0.04**
	2 yr postop	8.8 ± 7.5	11.6 ± 11.5	**0.01**
	Final f/u	7.2 ± 5.5	16.8 ± 14.3	**0.0002**

Results

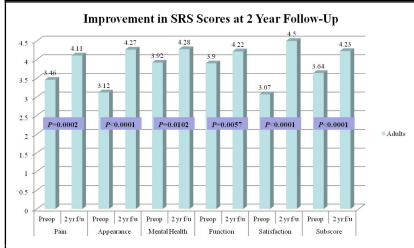
OR time (mean 274min AIS vs 280min YAIS, P=.92) and EBL (534mL AIS vs 605mL YAIS, P=.63) did not differ. AIS had greater reduction than YAIS in Cobb angles for MT curves (56° to 18° AIS vs 50° to 29° YAIS, P=.002), TL/L curves (38° to 10° for AIS vs 38° to 22° for YAIS, P=.04), and coronal balance (20mm to 7mm for AIS vs 14mm to 17mm for YAIS, P=.0002) at final f/u. Complications occurred in over twice as many YAIS [11 (19%)] as AIS [5 (8%)], though this was not significant (P=.11). YAIS began with worse SRS scores in all domains except mental health, but there were no differences in postop change (Subscores: AIS—3.98 improved to 4.44 postop; YAIS—3.64 improved to 4.15 postop; P=.0002 preop and P=.69 for difference between groups in final postop change)(Figure 1).



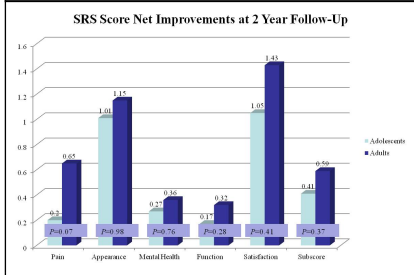
YAIS had worse preoperative SRS scores in several domains.



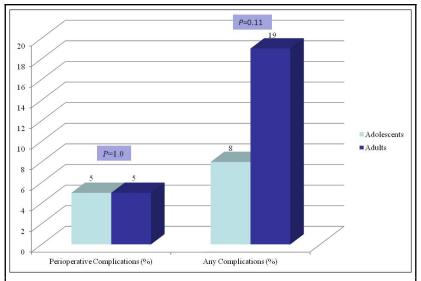
SRS scores for AIS improved significantly for all domains except pain.



SRS scores in YAIS improved significantly in all domains.



Changes in SRS scores post-surgery were not statistically different between groups.



YAIS had more complications, though the difference was not significant.

Conclusions

AIS gained more correction of MT and TL/L curves and coronal balance than YAIS. SRS scores for YAIS were lower preop but not different in postop improvement. YAIS had more complications, though this was not statistically significant. These results are important for discussion when AIS pts consider delaying surgery until their young adult life.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Note that both adolescents and young adults experience significant improvements in SRS-30 scores following surgery for idiopathic scoliosis, but that there is no difference between groups; 2) Recognize that young adults in our series did experience over twice as many complications as adolescents, though the difference was not statistically significant; 3) Note that young adults experienced inferior radiographic corrections of their curves compared with adolescents following surgery for idiopathic scoliosis.

References

Enercan M, Acaroglu E, Alanay A, Pellise F, Ozturk C, Kochai A, Kahraman S, Sanli T, Hamzaoglu A. Comparison of Outcomes of Surgery Performed in the Second Decade vs. the Third and Fourth Decades for Idiopathic Scoliosis. Paper #26, Scoliosis Research Society 47th Annual Meeting, Chicago, IL, Sept. 6, 2012.