Risk of Development of New Onset Post Operative Cervical Deformity (CD) in Thoracolumbar Adult Spinal Deformity (ASD) and Effect on Clinical Outcomes at 2 year follow up

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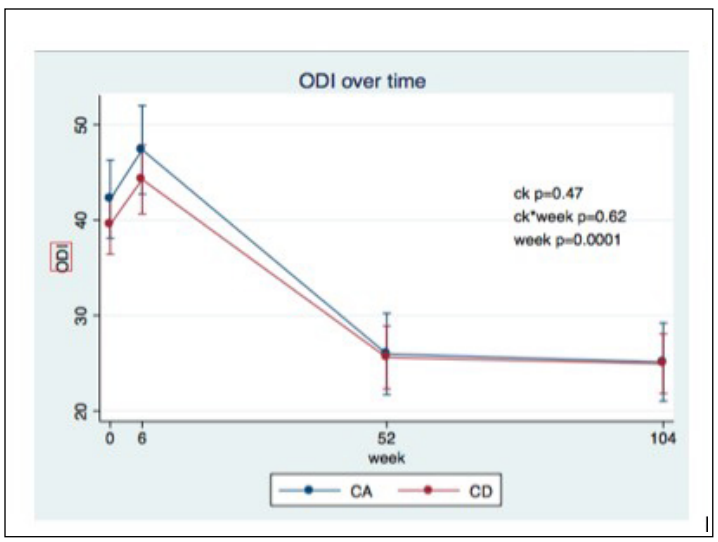
Introduction

A high prevalence of residual cervical deformity (CD) has been identified following surgical treatment of adult spinal deformity (ASD). Development of new onset CD is less understood and its clinical impact unclear. This study quantifies the incidence of CD after ASD surgery, identifies predictors of development, and determines the impact outcomes.

Methods

Retrospective review of prospective multi-center database yielded 215 patients (pts) with complete 2yr follow-up and full length xrays including the cervical spine. CD was defined by: T1S-CL>20°, C2C7 SVA>40mm, or C2C7 kyphosis>10°. Univariate analysis was performed using t-tests or tests of proportion. Multivariate logistic regression was used to determine independent predictors of new CD. The impact of CD on Health Related Quality of Life (HRQL) and satisfaction was measured using repeated measures mixed models or logistic regression as appropriate, accounting for potential confounders.



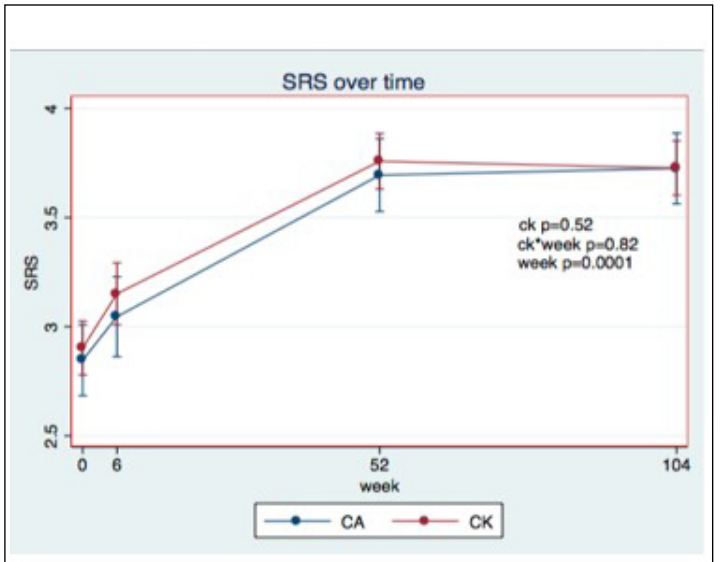
alignedbaseline	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
BL_CM_Diabetes	10.4968	12.38987	1.99	0.046	1.03835	106.1134
uiv_T5	.3165583	.1550952	-2.35	0.019	.1211754	.8269762
LATpre_TS_CL	1.081147	.0368049	2.29	0.022	1.011365	1.155744
LATpre_C2PT	.9053079	.052664	-1.71	0.087	.8077553	1.014642
_cons	.8044749	.3655215	-0.48	0.632	.3301872	1.960039

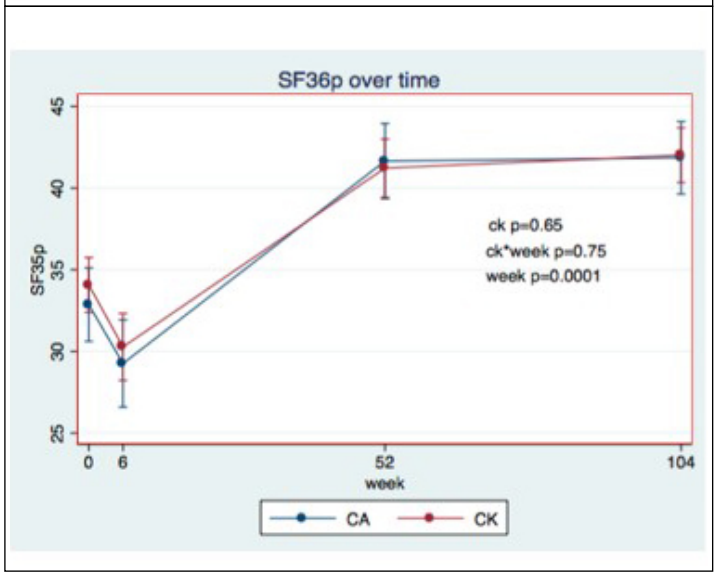
Results

88/215 ASD pts did not have CD at baseline and 42 of them (47.7%) developed CD at 2 years postop. Univariate analysis revealed that pts who developed new cervical deformity in the post op period had a higher incidence of diabetes (14.29%vs2.17%,p=0.036) increased pre-op C2C7 SVA (p=0.04) and C2 slope (p=0.038) and smaller diameter rods used at surgery (p=0.0328). Independent predictors of new CD at 2yrs included: diabetes (OR 10.49, p=0.046) and increased pre-op TS-CL (OR 1.08/deg,p=0.027). Ending instrumentation below T4 was a negative predictor of CD (OR 0.31, p=0.019). Pts with and without CD experienced improvements in 2yr SF-36 (p=0.0001), ODI (p=0.0001) and SRS (p=0.0001). Rates and overall improvement were similar. CD was not associated with decreased satisfaction (p=0.28).

Conclusions

47.7% of pts without preop cervical deformity develop new postop cervical deformity after ASD surgery. Independent predictors of new onset CD at 2yrs include diabetes, higher preop TS-CL, and ending instrumentation above T4. Significant improvements in HRQL scores occurred despite the development of postoperative CD.





Learning Objectives

By the conclusion of this session, participants should be able to:

1) identify the postop incidence of cervical deformity being 47.7% and 2) identify risk factors for postop new onset cervical deformity