

T1 slope is a potent predictor of subsidence in anterior cervical discectomy and fusion with stand-alone cages Dong Wuk Son; Geun Sung Song MD, PhD; Sang Weon Lee; Jun Seok Lee M.D.

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#### Background

-In laminoplasty Preoperative parameters including the T1 slope (T1S) and C2-7 sagittal vertical axis (SVA) as predictors of kyphosis after laminoplasty accompanied by posterior neck muscle damage.

#### -In ACDF

The importance of preoperative parameters has been under-estimated

#### Purpose

We aimed to determine whether postoperative subsidence and pseudarthrosis could be predicted according to specific parameters on preoperative plain radiographs.

### Methods

- -Retrospectiv, 41 consecutive patients
- -Male:Female, 22:19
- -Mean age, 51.15 +/- 9.25 years
- -ACDF with a stand-alone PEEK cage
- ->1 year follow-up)
- -Parameters including
- SVA, T1S,
- segmental angle (SA) and ROM, C2-7 cervical angle (CA) and ROM,

and segmental inter-spinous distance

## Results

-Inclusion: Fifty-five segments 27 single-segment and 14 two-segment fusions -Subsidence: 36.4% -Pseudarthrosis: 29.1% -Demographic data and fusion level were unrelated to subsidence. -Multivariate logistic regression analysis for subsidence: A greater T1S was associated with a lower risk of subsidence (p=0.017, odds ratio=0.206).-ROC analysis for cut off value of subsidence T1S <28° (sensitivity: 70%, specificity: 68.6%). -There were no preoperative predictors of pseudarthrosis except old age. Conclusions A lower T1S (T1S <28°) is a risk factor of

subsidence following ACDF. Surgeons need to be aware of this risk factor and should consider various supportive procedures to reduce the subsidence rates for such cases.



\*significant group difference at each time point (P<0.05).</li>
^Significant group difference in the longitudinal trend
(P<0.05). TIH: total intervertebral height; CA: C2-7 cervical angle; SA: segmental angle; T1S: T1 slope.</li>

# Table 1. Correlation analysis between postoperative change and preoperative factors

	Pre-operative parameters					
	CA	SA	SVA	T1S	ROM CA	ROM SA
ΔCA	r=-0.359*	r=-0.173	r=0.342*	r=-0.080	r=-0.291 <sup>†</sup>	r=-0.363*
	p=0.007	p=0.206	p=0.011	p=0.560	p=0.036	p=0.008
∆SA	-0.082	-0.421*	0.338 <sup>†</sup>	0.225	-0.259	-0.269
	0.554	0.001	0.012	0.098	0.064	0.054
ΔSVA	0.151	0.107	-0.472*	-0.086	0.247	0.308
	0.271	0.436	< 0.001	0.532	0.078	0.026
ΔTIH	-0.200	-0.023	-0.238	-0.351*	0.078	0.239
	0.142	0.868	0.080	0.009	0.581	0.088

\*indicates p<0.01, +indicates p<0.05, CA: C2-7 cervical angle, SA: segmental angle, SVA: sagittal vertical axis, T1S: T1 slope, ROM: range of motion, delta: the value of last follow-up minus the value of pre-operative value, TIH:





Scheme illustrating the statistical analysis. F: force; : T1 slope; : the angle between spinous process and F sin ; Fdisc: loading on disc