



Influence of anterior cervical discectomy with fusion on local and global spine sagittal alignment. Prospective study.

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Cervical Spine Research Society - Europe



Disclosures

ÇDisclosures

ÇNONE



Introduction & Background

- The influence of the global sagittal axis of the spine on correct posture and thus quality of life has been established. The following study seeks to examine the effect of anterior cervical discectomy with fusion on local and global spine alignment as well as patient outcome.

(Scheer, Harroud 2013, Duval-Beaupre 1992, Berthonnaud 2005)



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Materials and Methods

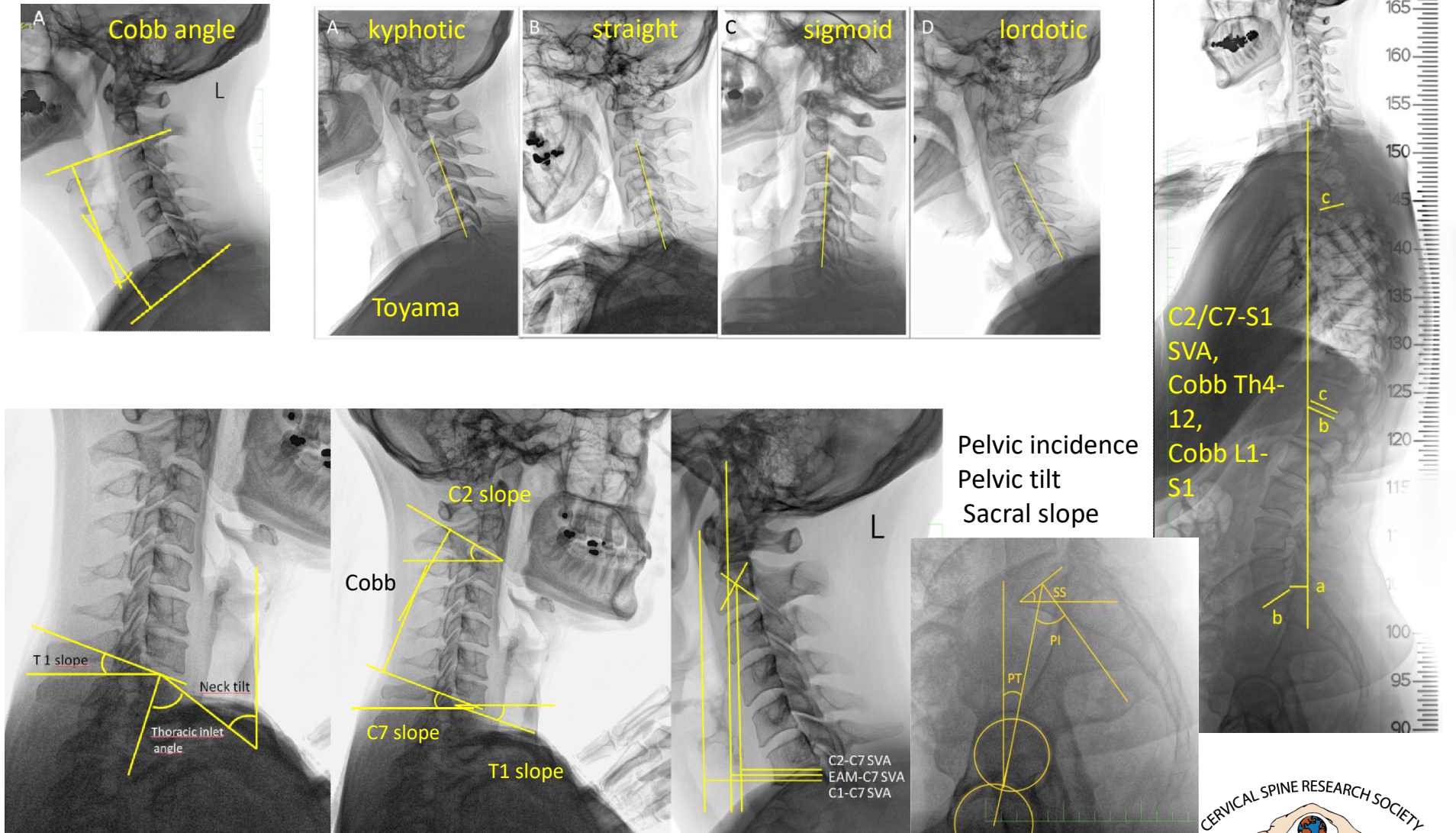
The authors present a prospective analysis of the sagittal profile of the cervical and global spine in a group of **110 patients after subaxial cervicla spine operation (ACDF)**, based on evaluation of preoperative and postoperative radiological and clinical data. There are two evaluated groups, two substudies.

1. **30 patients** s who underwent at least 1 year follow up.
2. **22 patients** with primary kyphotic sagittal balance of the cervical spine

The following parameters were used to describe the cervical sagittal profile: cervical lordosis using the **Cobb** method, **sagittal vertical axis C2-C7 (C2-7 SVA)**, **Toyama sagittal profile**, **thoracic slope (T1S)**, **T1S-Cervical lordosis (CL)** and **C2Slope**. **Thoracic kyphosis**, **lumbar lordosis** and **pelvic parameters - pelvic tilt (PT)**, **pelvic incidence** and **sacral slope**, were measured to assess the global spine axis. The global sagittal spine axis was evaluated by the **C2-S, C7-S vertical axis (C-S SVA)**. **The Neck disability index (NDI)** and **Visual analogue scale (VAS)** were used to assess clinical status before and after operation.



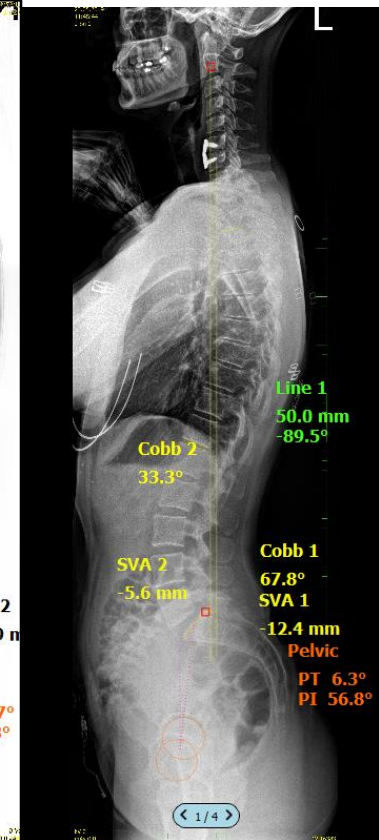
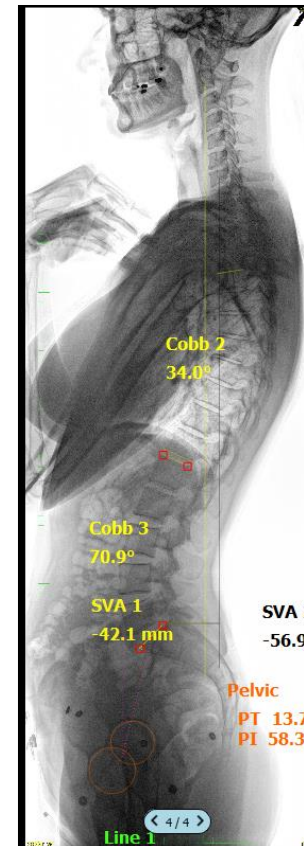
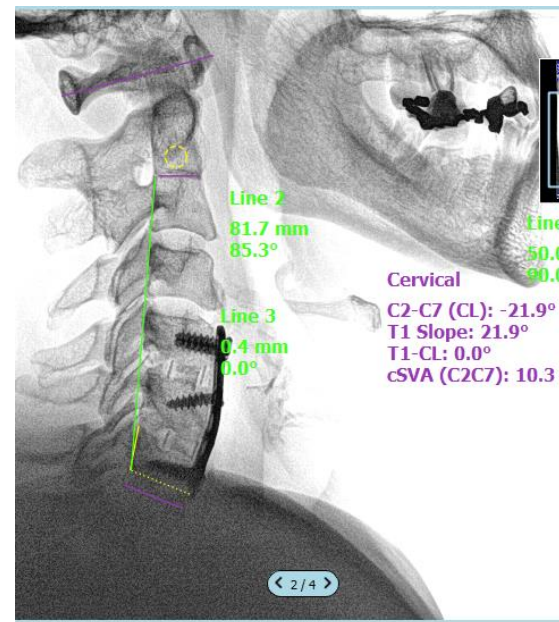
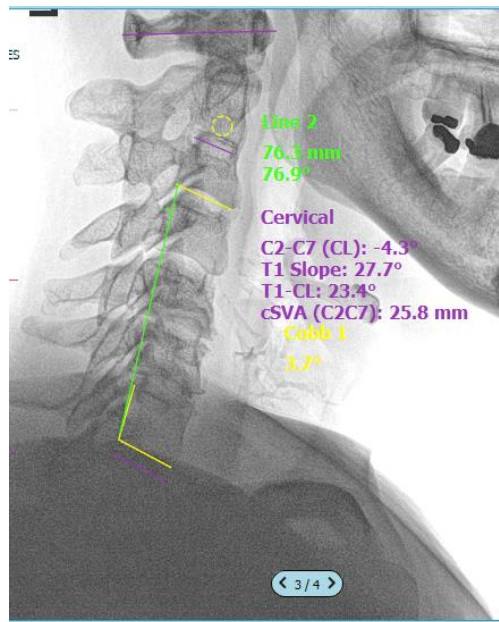
Materials and Methods - paramethers



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Results

Group 1.-All: After a one year follow-up, 30 patients were evaluated. Over 90% of patients showed . change in their cervical sagittal profile, C-S SVA, pelvic tilt and T1 slope. In 74% of cases, the C-S SVA improved by an average of 30.7 mm. PT or T1S also changed. Half of them on average 8.2 ° and the other half on average 4 °. 83% of patients had improvement of their cervical spine lordosis with an average increase of 5.6 °. Clinically, 80% of patients have improved



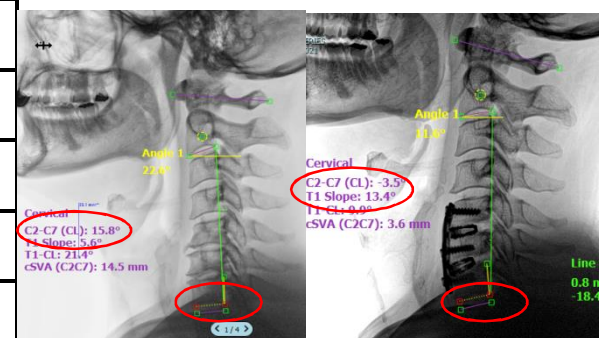
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Results

Group 2-Kyphotic.: In the group of 22 patients with kyphotic cervical sagittal balance 2 years after ACDF there was a significant change in the sagittal profile for lordotization (by 9.4 °) and a change in the T1 Slope. No significant difference between 1 or 2 level ACDF was found. There was a shift and a significant correlation of the local and global sagittal axis of the spine C2-C7 SVA and C2-S SVA. No further correlation was found between local and global parameters of the sagittal balance of the spine. There have been significant positive changes of VAS by more than 2/3 of patients..

Wilcoxon Matched Pair Test	N	T	Z	p-level
CL Cobb Before & CL Cobb After	22	19,0000	3,490057	,000484
TOY before & TOY after	22	18,000	3,522523	,000428
T1S before & T1S after	22	37,5000	2,889443	,003862
T1S-CL before & T1S-CL after	22	59,0000	2,191431	0,028421
VAS Cp before & VAS Cp after	22	34,5000	1,988201	,046798
VAS before & VAS after	22	15,00000	3,070300	,002140

Tab.1 Significant changes of paramethers before and after ACDF



Correlation	Valid N	Spearman R	t(N-2)	p-level
C2C7SVA PO & C2_SSVA PO	22	,453416	2,275038	,034061

Tab.2 Significant correlation of paramethers before and after ACDF



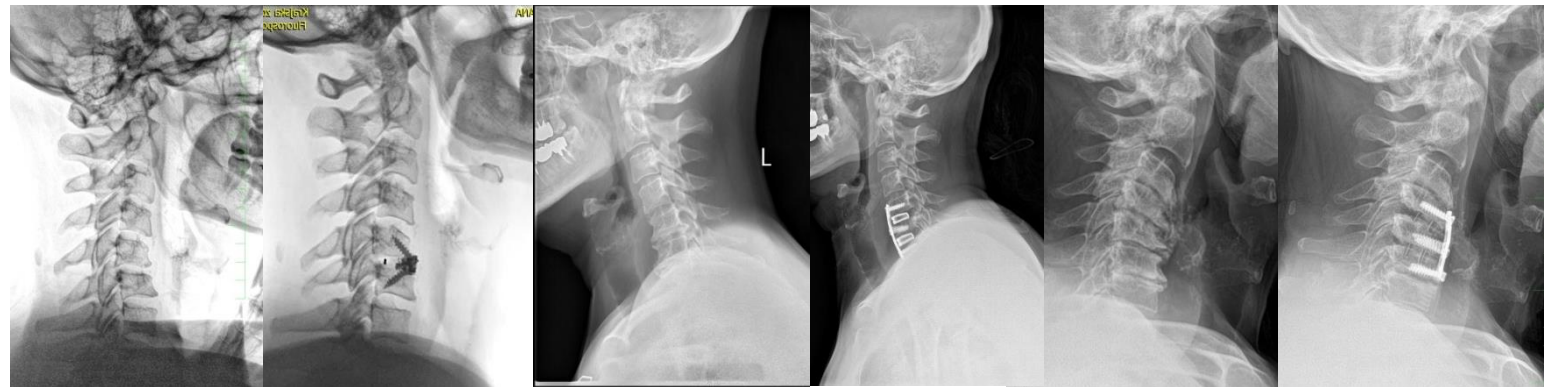
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Discussion

Several studies show a significant increase in cervical lordosis after ACDF, a higher percentage of cervical lordosis after multi-level procedures

Published positive correlation of T1S with CL and negative correlation of CL with C2-7SVA (Gillis 2016, De la Garza-Ramos 2016, Basques 2018, Guo 2018, Yu 2015)

Several studies show strong correlations of CL with the overall axis of the spine (C-S1 SVA) and correlation of the change of C-S1 SVA with spinopelvic parameters (PT, SS) (Kim 2015, Huang 2017)



Conclusion

Anterior microdiscectomy of the subaxial cervical spine significantly affects local sagittal alignment parameters- cervical lordosis and T1S and global sagittal parameter C2-S SVA. ACDF also likely to affects the global sagittal axis of the spine including spinopelvic parameters, but no correlate has yet been found between them in our study so far. ACDF also has a **positive impact on patients clinical status.** No correlate has yet been found between the clinical status of the patient after surgery, changes in the parameters of the sagittal spine axis or the number of operated levels so far.

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