



Modifications on cervical spine sagittal alignment after magnetic growing rod instrumentation. Is there a correlation with proximal junctional kyphosis?

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Introduction

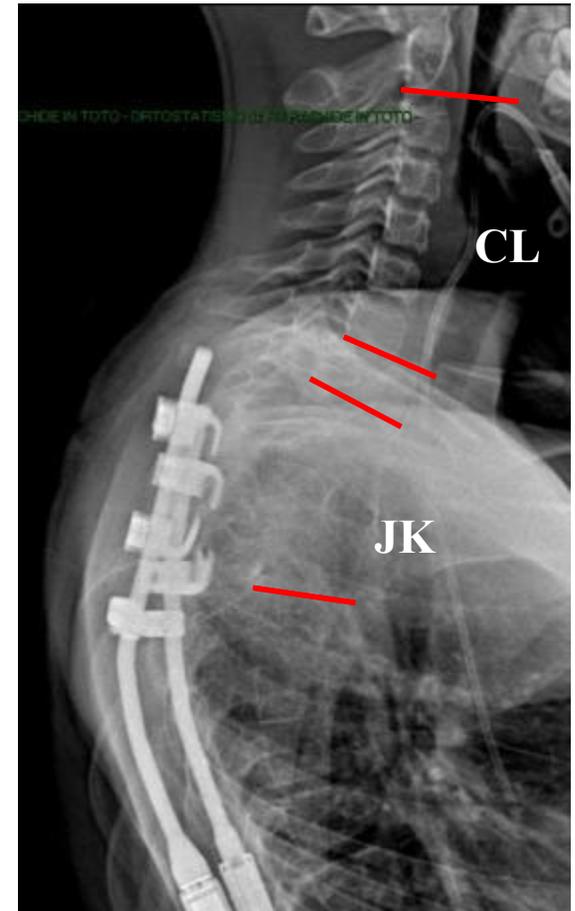
The purpose of this study was to examine a possible correlation between cervical spine sagittal modifications and proximal un-instrumented thoracic spine behavior in patients treated with magnetically controlled growing rod (MCGR) constructs.



Material And Methods

We reviewed retrospectively 6 consecutive patients treated with MCGR constructs, affected by early onset idiopathic scoliosis, focusing on changes upon:

- **cervical spine lordosis (CL)** calculated from C2 lower endplate to C7 lower endplate)
- **proximal thoracic junctional kyphosis (JK)** calculated as the angle between the vertebral endplates of two levels above and two levels below the proximal instrumented vertebra.
- **Scoliosis magnitude** expressed in Cobb angle, CL and JK were calculated before and after operation and at final follow up (FU).



Material And Methods

A possible **correlation between CL and JK** was evaluated.

All data were analyzed by SAS version 9.2.

Non-parametric correlation (Spearman's rho) was used to correlate:

- **post-op CL variation** (i.e. post-op value – pre-op value) to **post-op JK variation**
- **FU CL variation** (i.e. FU value – post-op value) to **FU JK variation.**

$P < 0.05$ was considered statistically significant

Results

Patients' age ranged from **4 to 11 years**.

Mean FU was **15 months** (min 12 - max 19).

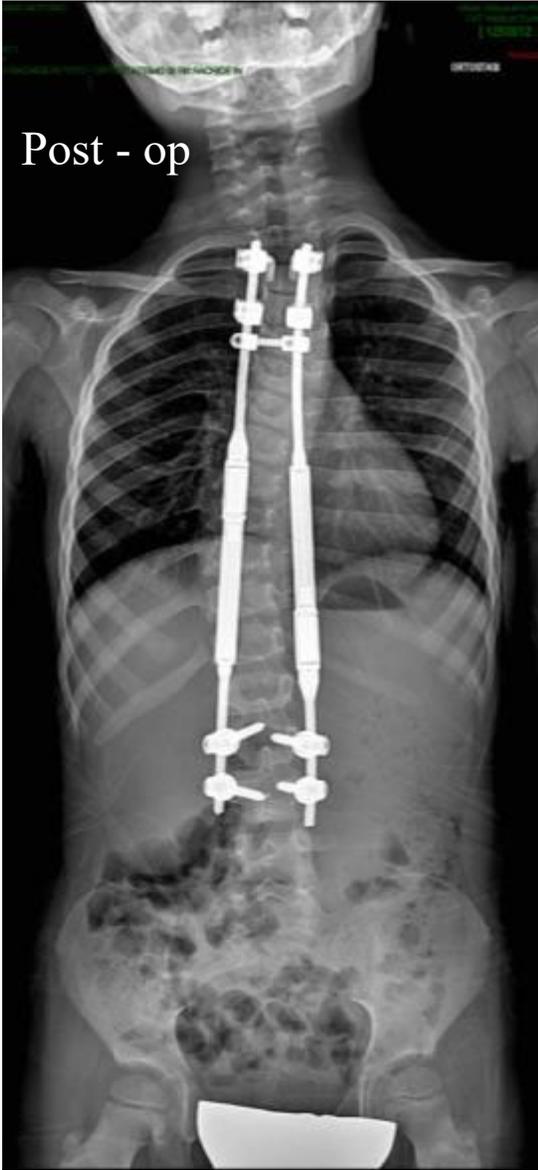
Main thoracic scoliosis was corrected from **62.7° to 32.0°**.

Mean **post-op CL variation** was **15.7°** ($\pm 11.2^\circ$, min 6.0° max 33.0°) while mean **post-op JK variation** was **0.95°** ($\pm 8.3^\circ$, min -10.0° max 15.0°): **no statistical correlation** was found between these two parameters.

Mean **FU CL variation** was **-20,0°** ($\pm 13.5^\circ$; min -43.0° max -3.0°) and **mean FU JK variation** was **16.4°** ($\pm 8.6^\circ$, min 7.8° max 30.1°): **a statistically significant correlation** was found between these two parameters ($\rho = -0.82857$, $p = 0.0416$).

JK was always asymptomatic.

Patient, male 4 years old



Conclusions

A statistically significant correlation was found between JK and progressive increase in cervical spine lordotic alignment over time. This finding may suggest that cervical lordosis increases over time in order to compensate PJK.

Future studies upon larger number of patients and longer FU must be carried out in order to confirm this theory.

In the immediate post-operative radiographic controls, non statistical correlation was found between JK and CL, which may indicate that correlation between these variables takes place at long-term rather than short-term.

Scoliosis correction was statistically significant in all patients.