In Congenital Cervical Scoliosis, the Lumbar Compensatory Curve has Higher Correlation with the Cervical Curve than the Thoracic Compensatory Curve

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BACKGROUND

Surgical indications for cervical congenital scoliosis are ill-defined, however progression and magnitude of compensatory curves are a relative indication to intervene. We sought to investigate the correlation between cervical congenital scoliosis and compensatory curves to elucidate more clear thresholds for surgery.

METHODS

Data were retrospectively collected from a single center identifying consecutive patients with isolated osseous congenital cervical scoliosis. Patients with concurrent thoraco-lumbar congenital abnormalities of formation or segmentation were excluded. Patients had a minimum of 2 year follow-up with serial imaging at 6 month intervals equating 40 total time points for bivariate Pearson correlation test.

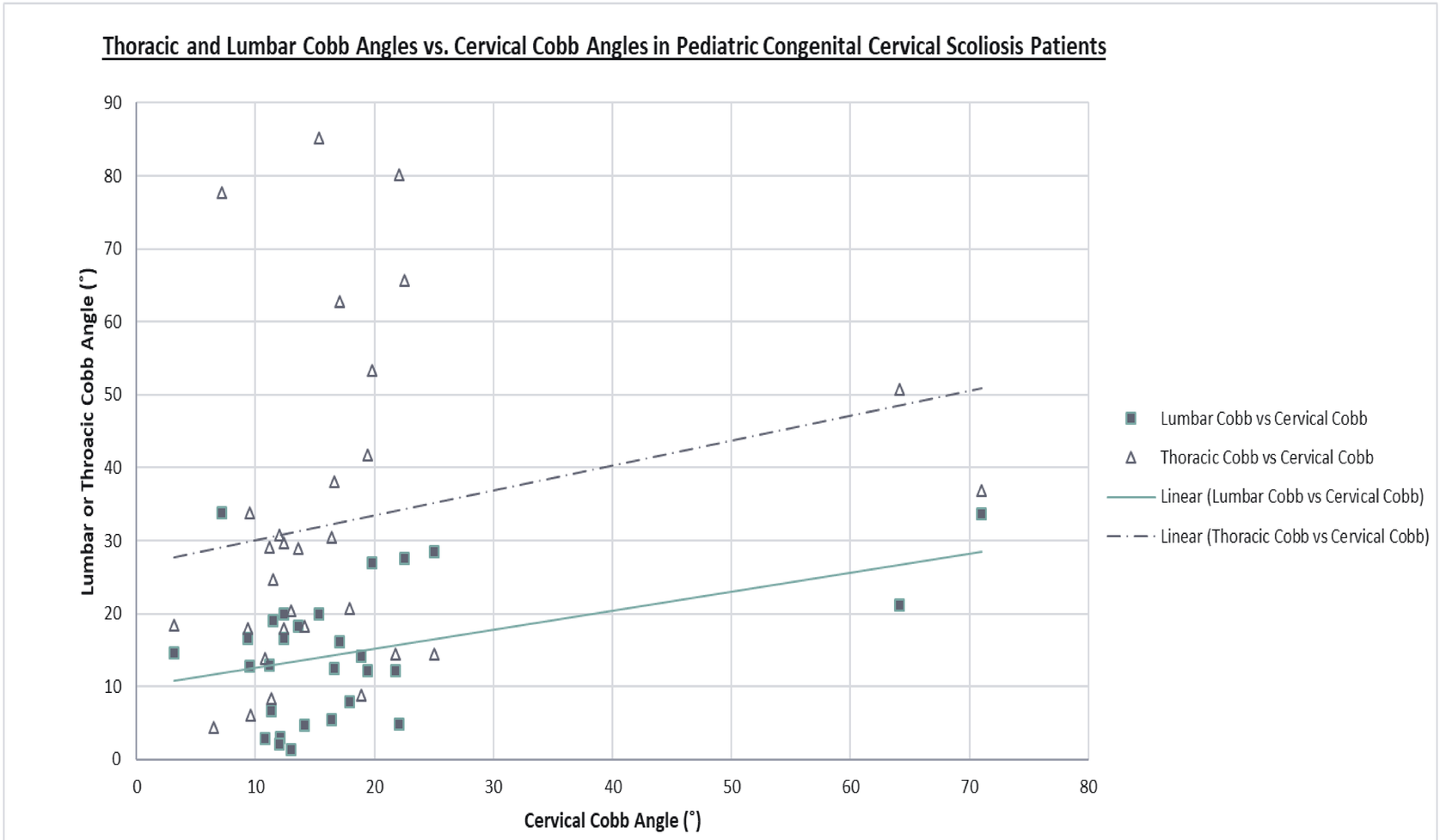

Figure 1: Scatter plot and associated line of best fit comparing cervical cobb angle to lumbar or thoracic cobb angle respectively

RESULTS

18 patients (12 M: 6F) with a mean age 7.0 ± 3.9 years were identified. The mean cervical, thoracic, and lumbar Cobb angles were, respectively, 18.3±14.3°, 32.8±22.6°, and 14.8±9.3°. Cervical Cobb angles were found to significantly correlate with lumbar Cobb angles (r=0.409), C2CSVL(r=0.407), and C7CSVL (r=0.403), $p<0.05$. Thoracic Cobb angle did not significantly correlate with cervical Cobb angle ($p=0.25$, r=0.218). However, thoracic and lumbar curve magnitudes did correlate with each other (r=0.377, $p<0.05$). Cervical Cobb also did not correlate with C2-SVA, C7-SVA, thoracic kyphosis, lumbar lordosis, or other sagittal measures.

CONCLUSIONS

In isolated congenital cervical scoliosis, cervical Cobb angles were significantly correlated with lumbar curve magnitude, but not thoracic curve size. Possibly the increased flexibility of the lumbar spine may allow greater compensatory balance and thus have greater correlation with cervical curve magnitude and possibly progression.