

Oral presentation

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Forced lordosis on the thoracolumbar junction can correct double major scoliosis; an innovative approach on brace treatment and etiology of adolescent scoliotic and kyphotic deformities

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Background context

Adolescent idiopathic scoliosis is an important spinal deformity. No etiology directed therapy is available. Correction can be achieved with limited options by bracing. The focus of bracing is in the coronal plane and with forces directed at the apices of curves. Bending radiographs in the coronal plane are used to assess flexibility and to predict treatment outcome. The corrective potential of fulcrum lordotic bending in the sagittal plane as technique in bracing has not been addressed in radiographic studies.

Purpose

To support our hypothesis that an early kyphotic deformity of the thoracolumbar junction plays a role in the development of scoliotic deformities and can be addressed to facilitate correction of scoliosis.

Study design

A prospective radiographic study was conducted.

Methods

Anteroposterior spine radiographs of patients with a double major curve pattern scoliosis were obtained in two groups of patients. In group A, radiographs in 3 positions: standing, and supine with and without radiolucent fulcrum ($n = 12$) were taken. In group B, radiographs in two positions ($n = 28$): standing, and supine with lordotic fulcrum were taken. Cobb angles of the scoliotic curves were determined and evaluated statistically. The sagittal con-

tour of the thoracolumbar junction in standing position was measured.

Results

In group A with the patients lying supine, a significant correction of the Cobb angle was obtained at the thoracic level of 15.4% and the lumbar level of 27.5% ($p < 0.001$). Adding in supine position, a lordotic fulcrum on the thoracolumbar junction resulted in further correction at the thoracic level of 15.7% and lumbar 18.1% ($p < 0.001$).

Comparing in group A the thoracic and lumbar curvatures in standing position with that on a lordotic fulcrum in supine position revealed a total reduction of 31% and 45.6%, respectively. For the independent group B, this reduction in one step is 38% and 44.4%, respectively.

Conclusion

In this radiographic study, correction of a double major curve scoliosis in the coronal plane appeared to benefit clearly from the application of a lordotic fulcrum on the thoracolumbar junction. This innovative approach was already valuable in the application of our bracing technique and maybe in developing strategies in surgical correction of scoliosis.

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