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The three dimensional analysis of the Sforzesco brace correction

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Background

Scoliosis is a three dimensional deformity, and brace correction should be 3D too. There is a lack of knowledge of the effect of braces, particularly in the sagittal and transverse plane. The aim of this study is to analyse the Sforzesco Brace correction, through all the parameters provided by Eos 3D imaging system.

Method

Design: This is a cross sectional study from a prospective database started in March 2003.

Participants: 16 AIS girls (mean age 14.01) in Sforzesco brace treatment, with EOS x-rays , at start, in brace after 1 month and out of brace at 4 months. Outcome measures: All the parameters and the Torsio-Index obtained from 3D Eos System, in and out of brace, in the three planes.

Statistical analysis: the variability of the parameters and the mean differences were analysed and compared using paired T test.

ANOVA was used for multiple comparisons. P value was set below 0.05.

Results

In the comparison in brace vs start of treatment the mean Cobb angle change significantly from 36.44 + -4 to 28.99 + -3.9 (p = 0.01). Significant changes in all the sagittal parameters were found (p = 0.02). In the axial plane, the TorsioIndex, changed significantly in brace, only for thoracolumbar and lumbar curves (P < 0.05). The analysis of the single vertebral tilt, demonstrated that the effect of brace are mostly concentrated to some segments: T4-T5; T10-T12, L1 and L5 in the AXIAL plane and T3-T6; T10-L1 in the frontal plane.

Conclusion

Sforzesco brace mostly modify the middle of the spine, and preserve the sagittal balance. The single vertebral orientation in each plane, should be considered together with the typically used values to assess brace effect.