Scoliosis

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Efficacy of bracing immediately after the end of growth: final results of a retrospective case series

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Objectives

The objective of this study was to verify the efficacy of bracing for adolescent idiopathic scoliosis (AIS) after the end of growth (Risser 4 and 5, until 20 years of age).

Background

It is widely thought that bracing after skeletal maturity is useless; even though some results we previously published point to a different hypothesis. According to our experience and some old masters proposals (Stagnara, Sibilla), in these cases we propose bracing for aesthetic reasons and in worst cases, for a possible curve reduction.

Methods

In this retrospective study, the population included all AIS patients with Risser 4-5 at start that reached the end of treatment since our database started in 2003. We had 23 females and 2 males, average age of 16.5 ± 1.6 years, and an average Cobb angle measurement of 27.4° ± 8.4°. Patients received bracing treatment with Lyon or SPoRT braces for 18 to 24 hours per day, in addition to specific exercises, respecting SOSORT criteria, with a rapid weaning (2-3 hours every 6 months). Outcome criteria included the following parameters: SRS (unchanged; worsened over 6°; over 45° at the end of treatment; surgically treated; 2 years follow-up); clinical (ATR, hump, Aesthetic Index, plumbline distances); radiographic (Cobb degrees); and ISICO (optimum; minimum). ANOVA and chi-test were used for data analysis.

Results

The reported compliance during the 2.6 ± 0.6 treatment years was 95.1 ± 7.8%, while residual growth was 0.9 ± 1.1 cm. No patients progressed over 45°, no one was fused, and this remained true at the 2 years follow-up for the 25% that reached it. Improvements were found in 48% and 36% of worst and average curves, and in 45%, 58% and 36% of Thoracic, Thoracolumbar and Lumbar curves respectively. We found highly statistically significant reductions of maximal (-4.4°), average (-4.2°), thoracic (-6.0°) and thoracolumbar (-6.6°) curves. Statistically significant improvements were found for Aesthetic Index, but not for ATR or plumbline distances. Clinically, 30% of patients improved over the measurement error for Aesthetic Index. According to ISICO criteria, 50% of patients had minimum and 35% optimal results.

Conclusion

Before 20 years of age, even in skeletally mature patients, it is possible to reach radiographic and aesthetic improvements, although not as good as during growth. Correction is based on bone growth, but ligaments and neuromuscular control of posture can also be involved.