Comparison of Static vs. Dynamic Bracing in Decreasing Curvature in Scoliosis

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Introduction

- Scoliosis is a complex, three-dimensional structural deformity of the spine characterized by axial vertebral rotation, a flattening of the sagittal plane, and a frontal plane curvature.
- Typically classified as:
  - Idiopathic (65%) - Unknown cause with subclasses as infantile, juvenile, adolescent, or adult, according to time of onset.
  - Congenital (15%) - Present at birth
  - Neuromuscular (10%) – Developed as a secondary symptom of another condition, such as spina bifida, cerebral palsy, spinal muscular atrophy, or other physical trauma.

Background

- Affects approximately 7 million people in the United States
- Seen in 1-3% of adolescent population
- Male :Female with 10 degree curve is equal.
- Male : Female with 30 degree curve is 1:10
- Curve progression defined by either a 5 or 10 degree change in curve magnitude.
- Skeletally immature patients with curves of 20-29 degrees, there was a 68% risk of curve progression.

Clinical Relevance

- Left untreated in the growing child, patients can experience impairments secondary to adulthood scoliosis such as: back pain, pulmonary dysfunction, cor pulmonale, psychosocial effects, and even death.1
- The younger the patient and the larger the curve at the initiation of bracing, the greater the chance of curve progression, thus necessitating surgery.
- Majority of literature signifies progression of more than 5 degrees, before skeletal maturity, as a benchmark for bracing failure, rather than spine surgery.1
- Dynamic bracing allows for, and is encouraged, to participate in sports while in brace. Static bracing requires activity to be done outside the brace.
- Patient compliance found to be the greatest limiting factor in research results in both types of bracing, although patients demonstrated slight better compliance with dynamic likely due to no limitation of activity while in brace.

Evidence

- To date, a major criticism of the bracing literature remains the absence of a prospective, randomized study to determine the efficacy of brace treatment.1
- Comparing several studies demonstrates that static and dynamic bracing shows 60-66% success rate preventing curve progression.1
- The initial cohort of AIS patients who were treated with SpineCor Dynamic Bracing System, showed an overall correction /stabilization for 93% of patients after 2 years.3
- Despite success with the Milwaukee, Wilmington, Spine-Cor, and Boston braces, at present none is demonstrably superior to the others with regard to treatment success, curve progression, or need for surgery.1

References