



Investigation of the Providence TLSO for Treatment of Scoliosis

Hannah G. Godlewski, C. Leigh Davis, CPO, MSPO

Children's Healthcare of Atlanta Orthotics and Prosthetics Department and Children's Orthopedics of Atlanta, Atlanta, GA

INTRODUCTION

Adolescent idiopathic scoliosis (AIS) has been defined by the Scoliosis Research Society (SRS) as a lateral curvature of the spine greater than ten degrees as measured using the Cobb method on a standing radiograph, with no clear underlying cause (Kane 1997). SRS guidelines recommend orthotic treatment for adolescents diagnosed with AIS with curves between 25 and 40 degrees. The goal of orthotic management in idiopathic scoliosis is to alter the natural history of the patients' curve.

Many studies have investigated the efficacy of orthotic treatment of scoliosis with mixed results. Treatment of high magnitude curves and treatment with night-time only orthoses is especially suspect. This study examined 80 patients, all treated by the same organization with Providence nocturnal orthoses who had varying degrees of scoliosis, including high and low magnitude curves. Success of bracing treatment was determined by curve magnitude at conclusion of treatment compared to initial curve magnitude and natural history data.

METHOD

Subjects: 80 patients, 71 females and 9 males; 8 to 16 years of age; median age of 12 years; no primary medical conditions or orthotic history. Inclusion criteria: at least 4 years of age, Risser 0, 1, or 2 at brace initiation, initial primary curve between 20 and 45 degrees, no prior orthotic treatment, pre menarche or less than 1 year post menarche, and diagnosed with idiopathic scoliosis.

Apparatus: With IRB approval, data was acquired retrospectively from Children's Healthcare of Atlanta's (CHOA) electronic medical records, Children's Orthopedics of Atlanta's (COA) patient transcriptions, patient x-rays, and Spinal Technology, Inc. records.

Procedures: 435 patients were identified who received a Providence Orthosis from the CHOA O&P Department between 2006 and present. Eighty patients met the criteria for inclusion and had completed orthotic treatment. All patients were included regardless of stated compliance. Data collected included pertinent medical history and Cobb angle at brace initiation and discharge.

Data Analysis: A statistical analysis on the data collected was completed to review the success and failure rates of the patients included in the study. The patient data was sorted using Microsoft Excel, SAS 9.2 (Cary, NC), and Chi-square tests.

RESULTS

For all 80 patients who met inclusion criteria, 46.2% had successful treatment with curves progressing only 5 degrees or less. Forty-nine patients met the SRS inclusion criteria, and 23 (46.9%) had a successful treatment outcome. Eighteen patients had initial curves of less than 25 degrees, and in this group there was a 55.6% success rate. Only two (15.4%) of the 13 patients with initial curve magnitude greater than 35 degrees had successful treatment. Curve type also affected outcome; thoracolumbar curves had the highest success rate at 56%.

DISCUSSION

When compared to natural history data, this investigation supports the treatment of scoliosis with the Providence orthosis. Lonstein and Carlson reported a 68% rate of progression in untreated boys and girls, Risser 1 or 2, and curves 20 to 29 degrees. Among the 30 patients in this study with the same demographics, the rate of progression was improved at 50% with treatment with the Providence. When compared to the two recent studies looking at outcomes with use of the Providence TLSO, the results of this investigation lie soundly in the middle of those previously reported. In all groups reviewed, this study fell short of the 74% success rate reported by D'Amato, et al, and surpassed the 31% success rate reported by Janicki, et al.

CONCLUSION

In conclusion, our results support the hypothesis that treatment with the Providence night time TLSO can change the natural history of scoliosis progression, as it was effective in preventing curve progression in 46% of the patients with idiopathic scoliosis. The rate increases for smaller magnitude curves and decreases for high magnitude curves. Thoracolumbar curves are most likely to success with this orthosis.

CLINICAL APPLICATIONS

This study supports that the clinical use of a Providence orthosis can be effective for AIS treatment, especially for smaller magnitude and thoracolumbar curves.

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