Treatment and Long-Term Follow-Up of Juveniles with Idiopathic Scoliosis Using ScoliBrace®. A Case Series.

Rosemary Mirenzi[1], Nora-Lee Doueihi[1], Juan du Plessis[1], Jeb McAviney[1]

1 ScoliCare Australia, Kogarah, NSW, 2217, Australia

ScoliCare®

BACKGROUND

Juvenile Idiopathic Scoliosis (JIS) is characterised by abnormal curvature of the spine in children between the ages of 3 and 9. JIS is a highly progressive condition exacerbated by growth. JIS greater than 30 degrees has been shown to increase rapidly and presents a 100% prognosis for surgery, emphasising the need for active treatment and management. This case series investigates the use of ScoliBrace® as a non-surgical treatment approach of Juveniles with idiopathic scoliosis.

OBJECTIVE

To report the long term outcomes of the use of ScoliBrace® in five Juvenile patients with Idiopathic Scoliosis classified as double or triple curves, with a primary right thoracic curve.

METHOD

A cohort of 5 patients with JIS, aged 5-9, were prescribed a full time (20-23 hours per day) ScoliBrace® for the treatment of JIS. Every ScoliBrace® was custom made for the individual by a design team and Computer-Aided Design and Manufacturer.

Bracing hours were adjusted based on individual patient findings regarding growth status (Risser sign, hand X-ray, change in height).

Patients were braced for 3-8.5 years (average 6.6 years), with follow-up appointments on a 3-monthly basis. Patients were monitored for a minimum of 5 years (5-10 year range).

Out-of-brace X-rays, postural images and Angle of Trunk Rotation (ATR) measurements from yearly timestamps have been collected for this case series.

RESULTS

This case series showed successful reduction of primary Cobb angles and ATR (Table 1) in all patients.

- Secondary and tertiary lumbar curves reduced from an average of 22.6 degrees to 6 degrees (average 73% reduction).

- Secondary and tertiary upper thoracic curves were initially present in 2 patients. These curves reduced from an average of 27 to 23 degrees (average 15% reduction).

- 2 patients developed a mild compensatory upper thoracic curve throughout the treatment.

Case	Initial Cobb Angle	Post Cobb Angle	Degree Reduction	% Reduction	ATR on Start	ATR on End	% Reduction	Years of Follow-Up*	Years of Bracing
1	30	6	24	80%	10	5	50%	5	3.1
2	37	19	18	49%	17	5	71%	8	8
3	31	20	11	35%	15	8	47%	10	8.5
4	42	4	38	90%	17	6	65%	10	7.5
5	24	22	2	8%	10	7	30%	7	6
Average	32.8	14.2	18.6	52.4%	13.8	6.2	52.6%	8	6.62

Table 1: Cobb Angles and ATR Measurements Pre and Post Treatment.
*Years of follow-up is inclusive of years of bracing

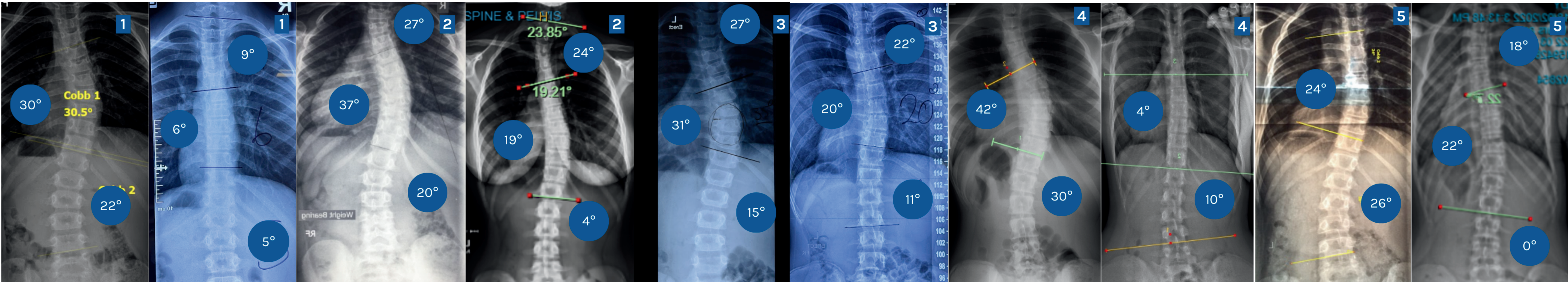Figure 1: Pre (left) and post (right) posture photos of all five case studies

Figure 2 : Pre (left) and post (right) X-ray images of all five case studies

CONCLUSION AND CLINICAL SIGNIFICANCE

Treatment of JIS using the ScoliBrace® resulted in a reduced Cobb angle at all spinal regions. ATR measurements at the level of the primary right thoracic curve was reduced in all patients. The ScoliBrace® may provide a useful treatment option for patients with JIS with double or triple curve classifications. ScoliBrace® treatment has the potential to improve Cobb angles and ATR in Juvenile patients with idiopathic scoliosis. This should be further investigated in future research.