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Supine fulcrum bending test and in-cast correction of Scheuermann's thoracic kyphosis

T Kotwicki*, W Ostiak, P Janusz and A Szulc

Address: Department of Pediatric Orthopedics and Traumatology, University of Medical Sciences, Poznan, Poland - ul. 28 Czerwca 1956 roku nr 135 61-545 Poznan 61 545, Poland

Email: T Kotwicki* - kotwicki@ump.edu.pl

* Corresponding author

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Background

Patients with Scheuermann juvenile kyphosis often require conservative management with a series of corrective casts, followed by anti-kyphotic brace. Flexibility of the kyphosis can be assessed during a supine fulcrum bending test.

Objective

The aim of the study was to analyze the radiological flexibility of kyphosis and immediate in-cast correction in a series of patients conservatively treated at our department.

Materials and methods

From 2001 to 2007, eighty-six adolescents were conservatively treated for Scheuermann juvenile kyphosis of thoracic location. Charts of 55 patients, 39 boys and 16 girls, were accessible. The age was from 11 to 18 years, with a mean of 14.6 ± 1.6 years. The location of hyper-kyphosis was middle thoracic in most cases, apart from five patients with a thoraco-lumbar location. In 18 patients, a mild non-progressive scoliotic curvature was present; it did not exceed a Cobb angle measurement of 25°. A clinically visible scoliosis concerned 50% of girls and 20% of boys. The scoliosis pattern did not follow any currently used scoliosis classification; the curvature was not harmonious.

On the lateral full cassette standing radiograph, the angle of thoracic kyphosis (T4-T12) and lumbar lordosis (T12-S1) were measured. On the frontal radiograph, the angle of scoliosis was assessed. The flexibility of kyphosis was assessed on a supine fulcrum bending lateral radiograph (Figure 1). The in-cast kyphosis angle was measured on a standing lateral radiograph.

Results

The initial kyphosis angle ranged from 40° to 80° (mean 59.2° ± 9.3°). The lordosis angle ranged from 53° to 96° (mean 76.3° ± 9.3°). The kyphosis angle on supine fulcrum bending test ranged from 13° to 55° (mean 30.4° ± 9.7°). The kyphosis angle in the reclining cast ranged

Figure 1

from 22° to 74° (mean 44.3° ± 12.5°). There was no correlation between age and the supine bending correction. There was a correlation between the correction obtained with the supine bending test and the immediate correction in the cast (r = 0.64, p = 0.0012).

Conclusion

The reduction of the kyphosis Cobb angle by supine fulcrum bending was 50% on average, while in the cast in standing position, only half of this correction was maintained.

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