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Title
First radiographic and clinical results of the M-brace in the treatment of adolescent idiopathic scoliosis

Introduction
The Maastricht brace (M-brace) was developed to improve patient compliance and associated efficacy of brace treatment in adolescent idiopathic scoliosis (AIS). The emphasis is on wearability and comfort for the patient, whilst retaining corrective pressure function. Initial pressure measurements in the M-brace revealed a higher corrective pressure as compared to the Boston brace, and a better patient reported quality of life as measured with the SRS 22 and Brace questionnaire. We present the first results of the efficacy in terms of curve correction of the M-brace in AIS. The aim of this study was to evaluate the in-brace curve correction of the Maastricht brace as compared to the Boston brace (the current gold standard), and thus to determine the effect of increased wearing comfort on treatment efficacy.

Methods
A total of 65 patients (mean age of 13 years, 11 boys) with mild to moderate AIS, who had been treated with the M-brace since January 2011, were included in this retrospective multicenter study. The very short term correction effectiveness of the brace was evaluated by comparing the primary and secondary curves on standard postero-anterior full spine radiographs, with and without M-brace, with those on bending X-rays. The degree of correction in the M-brace was then expressed as a percentage of the correction of the curves as achieved in the bending radiographs. The relative correction in brace is described as percentage of correction between standard postero-anterior full spine radiograph with and without M-brace. As a control group four patients were also fitted a Boston brace, in order to compare the in-brace correction between the braces.

Results
There were 51 patients with a primary thoracic curve, and 14 patients with a primary lumbar curve. The predominant Lenke classification was type 1 and 2. The average primary curve Cobb angle was 34.2° ± 10,1°. The average primary curve angle in bending x-rays was 15.5° ± 8.3°. In the M-brace the primary curve was 25.4° ± 10.1°. This is an in-brace correction of 48%. The relative correction in the M-brace of the primary curve was 26% and 31% of the secondary curve, respectively. The control group had an in-brace correction of 50% in the Boston brace versus 45% in the M-brace.

Conclusions
These preliminary results demonstrate an adequate in-brace correction of the M-brace, which is comparable to corrections found in current literature and similar to the in-brace correction of the Boston brace. With a probable better compliance because of a higher wearing comfort, the M-brace may be a promising new brace treatment for adolescent idiopathic scoliosis, without compromising treatment efficacy.