Paper #2: Guided Growth System (ggs) in the Treatment of Early Onset Scoliosis - 5 Years Follow-up

Michal Latalski, Ass Prof. MD PhD; Marek Fatyga, MD PhD; Krzysztof Kołtowski, MD; Anna Danielewicz-Bromberek, MD; Piotr Menarowicz, MD


Introduction: The aim of the treatment of children with EOS is controlling growth of the spine. Early progressive deformations require multiple stages of surgery performed every 6-12 months. One have to be reckoned with complications requiring additional surgical intervention.

Objective: The aim of the study is to present a method of surgical treatment of EOS involving the implantation of specially constructed implants to allow three dimensional correction of spinal deformity with a preserved capacity to continue the growth of spine without distraction staged operations followed by final fusion in mature spine.

Material. The clinical material consists of 26 patients: 20 girls and 6 boys aged 6 to 14 years (mean age - 9 years). 17 children had a single-curve (group A), 9 children had a double-curve (group B). The follow up ranged from 1 to 5 years (mean -3,7)

Method: In group A correction was performed by fixating and derotation of the apex of the curve. Spine was enabled to grow and slide cephaly and caudally along the rods. In group B correction was performed by fixating and derotation the caudal part of lumbar curve. Spine was enabled to grow and slide cephaly along the rods. Efficacy of spinal deformity correction using a GGS was estimated by Cobb angle measurement of the curvature, T1-S1 length, and apical vertebral rotation (AVR) 1 / before the operation, 2 / after surgery and 3 / follow up. Results. During surgery, all patients obtained a large correction of curvature ranging from 50% to 90% (on average -74%). The degree of correction was directly dependent on the size of the initial deformation of 62 to 120 ° (average 77 °). During the entire period of observation 22 patients did not require additional stage operative procedures. During the entire follow-up period, patients did not show any significant loss of correction. We have not observed any loss of correction or fits within the limits of measurement error. Four patients had to have the rods replaced with longer ones, since there was a risk that they might slide out of the farthest lower screws. In 11 patients, after skeletal maturity, we finished treatment by final spinal fusion achieving additional correction.

Conclusions: Using the method we obtained a very good 3D correction in the first stage of treatment. Maintenance of correction does not require any intermediate staged operating procedures. Patients do not require corrective brace. Using GGS in the EOS one avoid complications peculiar to current growth-sparing procedures. These patients would have had 60 lengthening procedures after their initial correction if treated by conventional growing rod methods.