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LETTER TO THE EDITOR

Letter to the editor regarding "Growth-preserving instrumentation in early-onset scoliosis patients with multi-level congenital anomalies"

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Dear Editor,

We read with great interest the study "Growth-preserving instrumentation in early-onset scoliosis patients with multi-level congenital anomalies" by Clement and colleagues [1]. The authors elaborately describe treatment results of various growth preserving instrumentation (GPI) systems in a large group of Early Onset Scoliosis (EOS) patients with multilevel congenital deformities. The strength of this paper is that it describes the results of the complete treatment period of these patients, and not only of the first years of follow-up. Our criticism is that almost all results attributed to the GPI were derived from measurements on graduates after final fusion surgery (24 of 26 patients).

The authors report that "…there was no progression of coronal curvature after GPI implantation". However, this was only compared between the GPI index surgery and after the final fusion surgery. By not reporting outcome parameters just before final fusion, it is difficult to distil the specific effect of the GPI on deformity progression. By including the effect of final fusion, GPI's efficacy will be erroneously overinflated [2]. Similarly, the results for length gain become too optimistic, despite the fact that the 0.4- and 0.8 cm/year for the T1-T12- and T1-S1 height respectively (based on data from Table 4), [1] is only about half of physiological growth [3]. Reporting results of all different treatment intervals, but especially the interval between index surgery and just before final fusion (the growth-friendly interval), might highlight important results that are crucial to be able to understand and compare effectiveness of different growth-friendly treatment strategies in this patient category.

A recent study by Xu et al. suggests that at least for a subset of the congenital EOS patients—namely those aged 9 to 11—one-stage posterior spinal fusion provides comparable or superior results to treatment with GPI, followed by final fusion [4]. In a commentary on the above study, Larson postulates that a less rigid implant may prevent implant complications, prevent stress-shielding of the spine and improve radiographic and clinical outcomes [5]. We agree with this view and believe that a more dynamic approach is feasible. Recently, we introduced the Spring Distraction System (SDS), a growing implant that provides continuous, dynamic distraction with a titanium spring around a sliding rod. In a preliminary series of 4 EOS patients with severe congenital deformities, the SDS was able to provide additional curve correction during the growth-friendly interval in addition to a height gain of 0.8 and 1.6 cm/year for the T1-T12 and T1-S1 segment, excluding the final fusion surgery [6].

Obviously, our results are only based on a small series of patients who still have a limited follow-up. However, they do indicate that this alternative approach is a viable option. To allow for thorough assessment of this strategy and many others that are currently under development, we would like to encourage our colleagues to report on the true performance of GPI systems, by comparing spinal morphometrics after GPI insertion with those just before final fusion.

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the version to be published. Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. MCK: Made substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data; or the creation of new software used in the work. Drafted the work or revised it critically for important intellectual content. Approved the version to be published. Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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