Editorial

JOURNAL OF CHILDREN'S ORTHOPAEDICS

Spine deformities in patients with cerebral palsy

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Dear Readers,

The first part of this issue of the *Journal of Children's Orthopaedics* has been edited in cooperation with the neuromuscular and spine study groups of the European Paediatric Orthopaedic Society (EPOS). It integrates the presentations given at the Society's 37th annual meeting in Tel Aviv, Israel (5th April 2019) in a two-hour focus session on cerebral palsy and associated spine deformities. The authors – who all practice in high-volume paediatric (neuro- and spine) orthopaedic units – highlight the current anatomical, biomechanical and surgical understanding of these deformities and the practical implications for conservative and surgical strategies.[1-5]

The natural history of spine deformities in patients with cerebral palsy is closely linked to their gross motor functioning. Incidence and risk of progression of spinal deformities are close to 100% in non-ambulating, severely affected individuals. Hence, caregivers must be broadly informed at an early stage of the deformity that conservative therapy is usually a 'time buyer' but is unlikely to prevent progression and a surgical intervention in the mid- and long term. The pelvis as an intercalary bone between the spine and the lower extremities is pivotal for the understanding and therapeutic action, be it conservative or operative. It constitutes the base of the spine and the rooftop of the hip. As such it is exposed to deforming forces that act from all directions. This results in significant intrapelvic asymmetries that have to be considered when it comes to iliosacral screw fixation.

There is an ongoing debate whether to operate on the spine or the hip first in case the spine deformity is associated with a dislocated hip, and whether to supplement iliosacral instrumentation. As the result of a vivid discussion during the symposium, the review of the literature and the combined experiences of the two groups, we may conclude as a practical and intuitive rule of thumb: the more pronounced and fixed the pelvic obliquity and the worse the gross motor function, the more it makes sense to first fix the spinal deformity and include the pelvis in order to re-horizontalize it and vice versa.

Until recently the sagittal spinal profile and the orientation of the pelvis have not gained as much attention in patients with neuromuscular spine deformities as compared to otherwise healthy ambulators. The importance of sagittal parameters for head control and sitting position as well as a possible association with the development of proximal junctional kyphosis and revision surgery has now been acknowledged although the body of knowledge for this specific group of patients is still limited. Instrumented levels, type of fixation as well as amount of sagittal correction need to be chosen wisely in order to achieve an optimal result.

Surgical deformity correction in severely affected, non-ambulating patients with cerebral palsy is still prone to complications. Keys to success are a meticulous preoperative assessment in a routine interdisciplinary assessment, an in-depth biomechanical understanding of the whole chain of reaction reaching from the lower extremity, through the hip joints, the pelvis and the spine up to the head, as well as an intraoperative subspecialized setting with two experienced spine surgeons who keep the overall surgical trauma low.

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COMPLIANCE WITH ETHICAL STANDARDS

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