Reviewer's Comment concerning “Multiaxial high modularity spinopelvis (HSMP) fixation device in neuromuscular scoliosis—a comparative study” (ESJO-D-13-00331R1 by Jin-Ho Hwang, Hitesh N. Modi, Seung-Woo Suh, Jae-Hyuk Yang, Jae-Young Hong)

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The authors publish on a new technique of pelvic fixation called “Multiaxial high modularity spinopelvis (HSMP) fixation device in neuromuscular scoliosis”. They report on 27 patients using such pelvic fixation and compare it to a historic control when they were using a classic pelvic fixation. Both groups are identical. Similar clinical and radiological results were obtained using conventional and “HSMP”-based pelvic fixation in patients with paralytic neuromuscular scoliosis.

Pelvic fixation was described initially by Allen and Ferguson [1]. Because of the complexity and some shortcomings of this former type of fixation we ourselves described several pelvic fixations over the years: the modified Luque for Duchenne's neuromuscular scoliosis, the MW fixation for severe and rigid pelvic obliquity, the adult pelvic fixation and the four-rod techniques for sacrectomy and/or previously failed deformity surgery [2–5]. Numerous authors have also described other methods of pelvic fixation, the latest using S2 screws to achieve anchor in the sacrum and pelvis [6]. Because of the complexity of pelvic fixation in neuromuscular scoliosis the authors have devised a multiaxial high modularity spinopelvic fixation. Under this complicated appellation it seems, according to the drawings, that such system relies on a lateral offset connector with polyaxial capabilities. Such lateral offset connectors already exist in most instrumentations systems when one wants to connect an iliac screw to the rod for instance or a screw that lies at a distance from the rod, except that they usually do not have any polyaxial capabilities. Obviously having two multiaxial capabilities on

either side (polyaxial crown on the iliac screw side and polyaxial connector on the rod side) can only make the connection of an offset rod to the iliac screw easier.

Principles of correction in neuromuscular scoliosis to correct the pelvic obliquity have so far relied mostly on the cantilevering techniques introduced by Allen and Ferguson, popularized with the unit rod and modified by ourselves with a modification of the Luque technique. In such technique one has to achieve a strong fixation on the sacropelvis side then the rods are introduced in the sacroplevis and cantilevering the rods to the spine achieves the bulk of the correction. In order to achieve better correction we introduced the MW fixation where it is possible to distract and compress on the high/low side of the pelvis after cantilevering. Therefore, most classic instrumentation corrections are performed from the bottom up.

The technique presented by the authors seems to rely on rod derotation like it has been classically described in the thoracic spine for adolescent idiopathic scoliosis. This is therefore a correction achieved from the top down. I would also think that using a rod derotation technique this can only be achieved one rod at a time. Using a classic system without the two multiaxial and translation capabilities of the “HSMP”, a rod derotation maneuver cannot be performed for a sacroplevic fixation as the distal tip of the rod describes a quarter or half circle with significant translation during rod rotation. As the pelvis and S1 screw are a fixed-point the rod derotation maneuver is not possible to correct pelvic obliquity using conventional systems.

In the authors' new HSMP fixation derotation is definitively possible as the transverse connector allows for translation and the two polyaxial connections allow for the rod to follow the arc of rotation. Therefore, such a system may be an advantage for surgeons who wish to correct the pelvic obliquity from the top down and with rod derotation technique.

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In conclusion, the authors' paper showed similar clinical and radiological results with conventional and HSMP-based pelvic fixation in patients with paralytic neuromuscular scoliosis. As often in surgery the criteria for success are how familiar a surgeon is with one technique or instrumentation. This connector that has a translation capabilities and a polyaxial head seems to be an advantage for pelvic fixation. However, as one adds more connections and more polyaxial capabilities one will lose in rigidity and expose to bursitis or fretting corrosions. Such system would need to be tested in a biomechanical lab to see its usefulness in rigid neuromuscular or adult scoliosis where pelvic fixation is required.

Conflict of interest The author has no conflict of interest.

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