Title
A Motion Preserving Surgical Treatment for Neuromuscular Scoliosis: A Case Report

Abstract
Introduction/Background: Approximately 98% of skeletally immature children with SCI will develop neuromuscular scoliosis, and two thirds will require surgical fusion. A posterior spinal fusion of the entire spine is standard of care. Maintenance of spinal flexibility and motion for potential growth is desirable. We present a case for proof of concept utilizing a surgical motion preserving technique to treat progressive neuromuscular scoliosis.

Case presentation and timeline: An 11-year-old girl who had sustained a T10 level (AIS A) paraplegia three years earlier in a motor vehicle accident presented with a progressive 60° neuromuscular scoliosis of the lumbar spine.

Diagnostic Focus and Assessment: The scoliosis was too severe to correct or stabilize with bracing.
Therapeutic Focus and Assessment: The mother was extremely reluctant to have an irreversible spinal fusion performed. The authors have extensive experience and success with motion preserving techniques for treating idiopathic scoliosis; thus, this option was proposed.

Follow up and Results: Surgery was performed in July 2015 with a 50% correction of the curve (curve pre op: 60°, post op 30°). The patient now sits without a pelvic obliquity and continues to have full range of motion of her lumbar spine.

Discussion: This case illustrates proof of concept for new thinking for treatment of children with neuromuscular scoliosis. Whereas the ultimate long term outcome is not yet known, surgical correction of neuromuscular scoliosis without spinal fusion does not eliminate treatment options if needed in the future, allowing for replacement of the implant or any other treatment. This is in marked contrast to a posterior spinal fusion, which is permanent and prevents alternative treatment options when they become available over the child’s life.

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Objective 1. Describe treatment options for paralytic scoliosis in patients with spinal cord injury.

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Financial Disclosure: Randal R. Betz is a paid consultant for DePuy Synthes Spine, Globus Medical, Medtronic, Abyrx, SpineGuard and Zimmer Biomet. He receives royalties from DePuy Synthes Spine and Medtronic. He is on the speakers' bureau of DePuy Synthes Spine. He receives stocks/options from Advanced Vertebral Solutions, MiMedx, Orthobond, Abyrx, SpineGuard, and MiMedx. He receives research support from DePuy Synthes Spine and publishers' royalties from Thieme.

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