VEPTR-Eiffeltower Construct in the Treatment of Neuromuscular Scoliosis—Preliminary Results

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Abstract:

Introduction The development of scoliosis in neuromuscular diseases is frequently seen in early childhood. Unfortunately, management of scoliosis with braces or physical therapy is usually not successful and leaves the child with a severe spinal deformity at maturity. The treatment with telescopic VEPTR devices theoretically offers the possibility to avoid rapid progression and the need for braces. It also avoids the need for early spine fusion with the deleterious effects on pulmonary growth. Material and methods 13 Children, seven female and six male patients, with an average age of 8 years and 8 months had an Eiffel tower VEPTR construct performed due to progression of neuromuscular scoliosis. Underlying diagnosis were myelomeningocele in six and muscular diseases in five patients. One patient had cerebral palsy and another patient had arthrogryposis. The average follow-up was 11 months. Results Average time for surgery was 110 min. No blood transfusions were required. Average hospital stay was 9 days. The Cobb-angel of the main curve decreased from 62° before to 31° after surgery which is a correction of 50%. Pelvic obliquity was corrected in all cases. No complications during surgery were encountered. Immediate complications after surgery included one wound slough in a patient with spastic quadriparesis and one pneumonia in a patient with spinal muscular atrophy and severe restrictive lung disease. Two patients with myelomeningocele had urinary tract infections which resolved after antibiotic treatment. Late complications included two broken ilium hooks in one patient with myelomeningocele and flexible thoracolumbar kyphoscoliosis and two proximal cradle migrations in patients with myelomeningocele. These problems were revised during the lengthening procedures which were scheduled every 6 months. One patient with poor skin coverage suffered from a deep infection which was revised successfully without removing the device. Patient and parent satisfaction was very high in all cases. Discussion VEPTR was devised as a non fusion technique especially for congenital scoliosis. Recently it has also been recommended for neuromuscular deformities. It is our strategy to apply a bilateral rib to pelvis construct (Eiffel tower-construct) to patients with neuromuscular spinal deformities who are not ambulatory. Our preliminary data suggest that this approach offers a very good correction of spinal deformities during growth with low morbidity and reasonable complication rate. It may avoid performing early spine fusions and the development of thoracic insufficiency syndrome.

Keywords:

Neuromuscular scoliosis, VEPTR, Non-fusion technique

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