VEPTR TREATMENT OF EARLY ONSET SCOLIOSIS (EOS) IN CHILDREN WITHOUT RIB ABNORMALITIES: LONG-TERM RESULTS OF A PROSPECTIVE, MULTICENTER STUDY

Ron El-Hawary, Kevin Morash, M Kadhim, MJ Smith, A Samdani, J Flynn: Children's Spine Study Group

ORTHOPAEDICS

BACKGROUND: The vertical expandable prosthetic titanium rib (VEPTR) is a well-known treatment of thoracic insufficiency syndrome, which has been applied to various etiologies of EOS. In 2007, a prospective study on VEPTR treatment of EOS without rib abnormalities was initiated.

METHODS: A prospective, multicenter cohort design was employed. Participants underwent VEPTR implantation ≥5 years prior to analysis. Pre-implantation and last available radiographs were compared, regardless of whether VEPTR remained in vivo. Additional analysis was performed if VEPTR was in vivo ≥5 years.

RESULTS: This study included 59 patients (mean age at VEPTR insertion 6.1±2.4 years; mean f/u 6.9±1.4 years). Currently 24 patients still have VEPTR, while 24 have converted, 3 had VEPTR explanted, 6 unknown and 2 deceased. On last imaging (n=59; mean f/u 4.8±1.9 years), scoliosis improved from 71.8±18.0° preoperatively to 60.9±20.3° (p<0.001) and T1- T12 height increased (15.8±3.2 cm to 19.3±3.8 cm, p<0.001). T1-S1 height also increased (24.8±4.4 cm to 31.2±5.3 cm, p<0.001), representing 119% age-matched growth. Composite improvement of scoliosis, T1-T12 and T1-S1 height was achieved in 79%.

A subset of 29 patients was analyzed at most recent f/u ≥5 years while VEPTR remained in vivo (24 VEPTR patients above, and 5 with VEPTR later removed). Mean age at insertion was 5.0±2.2 years; mean duration of 6.2±1.1 years. Scoliosis improved from preoperatively (69.3±14.5° to 61.6±16.1°, p=0.006), T1-T12 height increased (15.0±3.3 cm to 18.7±3.3 cm, p<0.001) and T1-S1 height increased (23.7±4.5 cm to 30.1±4.6 cm, p<0.001), representing 83% age-matched growth. Composite improvement was achieved in 83%.

CONCLUSION: At minimum 5-year follow-up, VEPTR controls scoliosis and allows spinal growth.