Panel), Orthopaedic Research Society (Advisory Board or Panel), Pediatric Orthopaedic Society of North America (Advisory Board or Panel), Orthopediatrics (Consultant); Craig Birch, Boston Childrens Hospital; Nora O'Neill, Boston Children's Hospital; Lawrence Karlin, Boston Childrens Hospital; Mark Proctor, Boston Childrens Hospital; Daniel Hedequist, Boston Childrens Hospital

Paper #25

Os Odontoideum in Children: Treatment Outcomes and Neurologic Risk Factors

Ilkka Helenius, Jennifer Bauer, Bram Verhofste, Paul Sponseller, Walter Krengel, Daniel Hedequist, Patrick Cahill, A Noelle Larson, Joshua Pahys, John Anderson, Jeffrey Martus, Burt Yaszay, Jonathan Phillips

Summary: Nonoperative treatment of os odontoideum provided good outcomes in children with normal neurologic function and a stable atlantoaxial joint. One of 31 nonoperatively treated children developed cervical instability during follow-up. Atlantoaxial instability (AAD, >5mm) or limited space available for cord (SAC, ⩽13mm) was associated with an 8-fold higher risk for neurologic deficits; therefore, children with these risk factors should undergo cervical spinal fusion.

Hypothesis: We hypothesised that children with atlantoaxial instability (AAI) or limited SAC would present increased risk of neurologic injury.

Introduction: Treatment outcomes and risk factors for neurologic deficits in pediatric os odontoideum are unclear.

Methods: We reviewed data from 102 children with os odontoideum treated at 11 centers between 2000 and 2016, who had minimum 2-year follow-up. 31 children had nonoperative treatment, and 71 underwent instrumented posterior cervical spinal fusion for C1-C2 instability. Nonoperative treatment consisted of observation (n=29) or immobilization (cervical collar, n=1; halo body jacket, n=1). Surgical treatment consisted of atlantoaxial (n = 50) or occipitocervical (n = 21) arthrodesis. One patient underwent transoral odontoidectomy.

Results: Thirty children (29%) presented with neurologic deficits, 28 of whom had radiographic AAI (atlantoaxial distance [AAD] >5 mm) or limited SAC (⩽13 mm) (RR 7.8 [95% confidence interval, 2.0 to 31] compared with children with no radiographic risk factors). 27 children without neurologic deficits or AAI at presentation underwent nonoperative treatment and remained asymptomatic. One developed AAI, and another had a persistent neurologic deficit; both children underwent spinal fusion during FU. One child with AAI declined surgery and remained asymptomatic. Spinal fusion occurred in 68 (96%) patients in the surgical group during FU (mean, 3.7 years). Surgical complications occurred in 21 (30%) children, including nonunion in 12, new neurologic deficits in 4, and vertebral artery injury in one. Nine children underwent revision surgery. In the surgical group, JOA neurologic function scores improved significantly from preoperatively to final FU for upper extremities (p = 0.026) and lower extremities (p=0.007).

Conclusion: Risk of neurologic deficit was associated with AAI and limited SAC in children with os odontoideum. Nonoperative treatment was safe for asymptomatic patients without atlantoaxial instability. Spinal fusion resolved the neurologic deficits of children with symptomatic os odontoideum.

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Paper #26

Growth-friendly Instrumentation for the Treatment of Early-onset Scoliosis in Marfan Syndrome

Laura Bellaire, Graham Fedorak, John Heflin, Joshua Klatt, John Smith, Paul Sponseller, Daniel Hedequist, Pediatric Spine Study Group

Summary: This study aims to evaluate the safety and efficacy of growth-friendly spinal instrumentation in children with Marfan Syndrome (MFS) and early-onset scoliosis (EOS). Two large prospective EOS registries were queried over a 20 year period; 42 MFS patients were identified. Patients experienced a mean of 2.6 complications and 7.1 reoperations during treatment. Radiographs demonstrate successful maintenance or reduction in scoliosis in most patients.

Hypothesis: The outcomes, including safety and efficacy, of growth-friendly spinal instrumentation in patients with Marfan Syndrome are similar to those with idiopathic early onset scoliosis.

Introduction: There are few reports on the management of EOS associated with MFS. More rapidly progressive than idiopathic EOS,