Normal Anatomy, Variants, and Trauma of the Pediatric Cervical Spine

Lustrin, E. S.1· Karakas, S. P.1· Ortiz, A.2· Castillo, M.3· Cinammon, J.1· Vahessan, K.1· Brown, J. H.4· Black, K.5· Diamond, A. S.1
1Long Island Jewish Medical Center, New Hyde Park, NY, 2Winthrop University Hospital, Mineola, NY, 3University of North Carolina School of Medicine, Chapel Hill, NC, 4Corinthian Diagnostic Imaging, New York, NY, 5North Shore University Hospital, Manhasset, NY.

Purpose
To review the normal developmental anatomy of the infant cervical spine, normal variants, and injuries that occur in the pediatric population.

Materials & Methods
Normal anatomy and development is reviewed, as well as imaging techniques. This exhibit also provides review of the unique type of injury that occurs in the pediatric population.

Results
Cervical spine injuries in children usually occur in the upper cervical spine from the occiput to C2 and this may be explained by the unique biomechanics and anatomy of the pediatric cervical spine. The fulcrum of motion in the cervical spine in children is seen at the C2/3 level as compared to the adult cervical spine which has its fulcrum centered at the C5/6 level. The immature spine is hypermobile because of ligamentous laxity, shallow and angled facet joints, underdeveloped spinous processes, and physiologic anterior wedging of vertebral bodies that result in high torque and shear forces applied to the C1/C2 region. Incomplete ossification of odontoid process, relatively large head and weak neck muscles are other causes of instability of pediatric cervical spine.

Conclusion
Although a child can be defined radiographically as an individual with open epiphysis, this definition is not applicable in the spine. By the time a child reaches the age of 8-10 years, the cervical spine reaches adult proportions. After the age of 10-12 years pediatric and adult trauma are similar. This exhibit will focus on the normal developmental anatomy of the cervical spine, its variations, as well as on cervical spine injuries that occur in the pediatric population.