Atlantooccipital dislocation

Occipital condyle fracture

Injuries of the occipitoatlantoaxial region (Oc-C2) region are the predominant form of cervical injury in children younger than 10 years of age. Magnetic resonance (MR) imaging can be used to visualize directly the traumatic ligamentous and soft-tissue abnormalities of the Oc-C2 region. A retrospective review was undertaken to examine the spectrum of pediatric Oc-C2 injuries seen on MR imaging, their correlation with plain x-ray film and computerized tomography findings, and their clinical course. METHODS: Seventy-one consecutive children younger than 10 years of age underwent cervical MR imaging for evaluation of traumatic injury. Magnetic resonance imaging was used to document abnormalities in 23 children; 20 of these injuries involved the Oc-C2 region. Abnormalities in the Oc-C2 region included disruptions of the musculature, apical ligament, atlantooccipital joint(s), tectorial membrane, and spinal cord. A spectrum of injury with progressive involvement of these structures was seen, ranging from isolated muscular injury to the multiple soft-tissue and ligamentous disruptions with craniocervical dislocation. Involvement of the tectorial membrane was the critical threshold in the transition from stable to unstable injury. Analysis of plain x-ray films revealed that a novel interspinous C1-2:C2-3 ratio criteria of greater than or equal to 2.5 was predictive of tectorial membrane abnormalities on MR imaging, with 87% sensitivity and 100% specificity. In patients with tectorial membrane abnormalities who underwent immobilization alone, interim platybasia was demonstrated on follow-up MR images. Conclusions. A progressive spectrum of distinct Oc-C2 injuries can occur in young children; the tectorial membrane is a critical stabilizing ligamentous structure in the Oc-C2 complex; and tectorial membrane abnormalities may be identified by a C1-2:C2-3 ratio of greater than or equal to 2.5 [1)].

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Sun PP, Poffenbarger GJ, Durham S, Zimmerman RA. Spectrum of occipitoatlantoaxial injury in young children. J Neurosurg. 2000 Jul;93(1 Suppl):28-39. PubMed PMID: 10879755.