POSNA
The Core Curriculum

Lumbar (and thoracolumbar) fractures

Objectives

1. List the common injury mechanisms of injuries to the thoracolumbar and lumbar spine in children
2. Discuss the role of the end plate in the anatomic features of compression fractures of the lumbar spine in adolescents, and how the pattern of injury differs from the adult
3. Describe treatment for the compression fractures, flexion-distraction injuries, and burst fractures
4. Describe indications for operative treatment of children's thoracolumbar and lumbar fractures

Discussion point

1. In what way is a limbus fracture of the lumbar vertebra similar to a slipped capital femoral epiphysis?

Discussion

Although infrequent, fractures of the thoracolumbar and lumbar spine can present challenges in diagnosis and treatment. In general, the classification of Denis is used for analysis of injury. Compression fractures assume much more importance in the lumbar spine. Aufdermaur demonstrated conclusively that the growth plate was the primary site of failure in spinal injuries in adolescents, and a considerable literature has followed his publication. Prior to CT and MRI imaging, such injuries would have been classified as SCIWORA, but the pathology of growth plate failure and extrusion of the vertebral limbus into the spinal canal has been repeatedly and well demonstrated. With violent trauma, the translation and rotation of the fracture occurs at the growth plate, in which case the displacement is obvious; in limbus fractures the growth plate can displace posteriorly into the spinal canal, producing disc-like symptoms. Several patterns of displacement have been identified, CT myelography is reported as the most accurate imaging modality for diagnosis. Diagnosis is often delayed for weeks. The age of affliction for apophyseal fractures and the site of failure through the growth plate has led some to compare apophyseal fractures with slipped capital femoral epiphysis.

Burst fractures (failure of anterior and middle columns) can be unstable mechanically or neurologically. Both operative and nonoperative methods of treatment have been reported, recent work indicates that most of these injuries can be managed nonoperatively, even in adults. Small amounts of residual kyphosis have not been problematic in follow-up. Flexion-distraction injuries imply that posterior distraction forces predominate, and that pattern of injury depends on the fulcrum of rotation at the time of injury. With a seat belt the fulcrum will be anterior, and posterior

failure from distraction is the predominant feature (Rumball and Jarvis). If the posterior injury is ligamentous, surgical stabilization of the separated spinous processes is indicated. If the injury is bony, healing of the fracture in a hyperextension cast will produce a stable spine. In general, operative treatment is only necessary when there is a worsening neurologic deficit, mechanical instability, or worsening deformity.

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