SCIWORA

Although spinal cord injury is uncommon in children, there is a subgroup of these in which no radiographic evidence of bony or ligamentous disruption can be demonstrated (including on dynamic flexion-extension X-rays). This is attributed to the normally increased elasticity of the spinous ligaments and paravertebral soft tissue in the young population.

Faro et al. found DTI changes in children with SCIWOMR with different causes of spinal lesions. They also investigated the relationship between DTI and clinical American Spinal Injury Association Impairment Scale scores. This study further examined the potential diagnostic value of DTI and should be translatable to adults with spinal cord injury [1].

The acronym SCIWORA (Spinal Cord Injury Without Radiographic Abnormality) was first developed and introduced by Pang and Wilberger who used it to define “clinical symptoms of traumaticmyelopathy with no radiographic or computed tomographic features of spinal fracture or instability”. The first case of SCIWORA was reported by Burke in 1974 [2].

Epidemiology

SCIWORA lesions are found mainly in the cervical spine but can also be seen, although much less frequently, in the thoracic or lumbar spine. Based on reports from different authors, SCIWORA is responsible for 6 to 19% and 9% to 14% of spinal injuries in children and adults, respectively. Underlying degenerative changes, including spondylosis or spinal canal stenosis, are typically present in adult patients. The level of spinal cord injury corresponds to the location of these changes. With recent advances in neuroimaging techniques, especially in magnetic resonance imaging, and with the increasing availability of MRI as a diagnostic tool, the overall detection rate of SCIWORA has significantly improved [3]

The age range of children with SCIWORA is 1.5–16 years, it has a much higher incidence in age ≤ 9 yrs [4]. The spinal cord may undergo contusion, transection, infarction, stretch injuries, or meningeal rupture. Additional etiologies include blunt abdominal trauma with disruption of blood flow from the aorta or segmental branches and traumatic disc herniation. There may be an increased risk of SCIWORA among young children with asymptomatic Chiari I malformation [5].

54% of children with SCIWORA had a delay between injury (at which time some children experience transient numbness, paresthesias, Lhermitte’s sign, or a feeling of total body weakness) and the onset of objective sensorimotor dysfunction (“latent period”) ranging from 30 minutes to 4 days.

Management

The mainstay of treatment in patients with SCIWORA is nonoperative management including steroid therapy, immobilization, and avoidance of activities that may increase the risk of exacerbation or

recurrent injury. Although the role of operative treatment in SCIWORA can be controversial, surgical alternatives such as decompression and fusion should be considered in selected patients with clinical and MRI evidence of persistent spinal cord compression and instability [6)]

Level III

● external immobilization of the injured spinal segment for up to 12 weeks

● early discontinuation of external immobilization for patients who become asymptomatic and are confirmed to have no instability on flexion-extension X-rays

● avoidance of “high-risk” activities for up to 6 months after SCIWORA Surgical intervention, including laminectomy, has shown no benefit in the few cases where it has been tried. Due to a 20% rate of repeat injury (some due to trivial trauma, and some without identifiable trauma) within 10 weeks of the original trauma when treated with only a rigid collar and restriction of contact sports (both for 2 months), more aggressive measures were initially recommended

● admit the patient to the hospital (helps emphasize the seriousness of injury)

● BR with rigid cervical collar until flexion-extension films are normal

● MRI of the cervical spine to document the presence of spinal cord injury

● detailed discussion with patient and family about seriousness of injury and rationale for treatment outlined here

● immobilization in Guilford brace for 3 months

● prohibition of contact and noncontact sports

● regular follow-up visits for monitoring condition and compliance

● liberalize activities at 3 months if flexion-extension films are normal this represents an extremely conservative recommendation, a less restrictive recommendation is immobilization for 1–3 weeks

1)
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