Spinal cord injury complications

Delayed deterioration following spinal cord injuries

Etiologies include:

1. posttraumatic syringomyelia. Latency to symptoms: 3 mos-34 yrs

2. subacute progressive ascending myelopathy (SPAM): rare. The median time of occurrence: 13 days post-injury (range: 4–86 days). Signal changes extending to ≥ 4 levels above the original injury

3. unrecognized spinal instability: mean delay in diagnosis was 20 days

4. tethered spinal cord: may be due to scar tissue at the site of injury

5. delayed spinal epidural hematoma (SEH): most symptomatic SEH occur within 72 hours of surgery; however, longer delays have been reported

6. apoptosis of neurons, oligodendrogliocytes, and astrocytes: initiated during the acute phase, deterioration occurs during the chronic phase of SCI (months to years after SCI)

7. glial scar formation: mass effect as well as release of factors that may damage surviving neurons

Scoliosis

Almost all pediatric patients who incur a spinal cord injury (SCI) will develop scoliosis, and younger patients are at highest risk for curve progression requiring surgical intervention. Although the use of pedicle screws is increasing in popularity, their impact on SCI-related scoliosis has not been described.

Hwang et al. retrospectively reviewed the radiographic outcomes of pedicle screw-only constructs in all patients who had undergone SCI-related scoliosis correction at a single institution.

Medical records and radiographs from Shriner's Hospital for Children-Philadelphia for the period between November 2004 and February 2011 were retrospectively reviewed.

Thirty-seven patients, whose mean age at the index surgery was 14.91 ± 3.29 years, were identified. The cohort had a mean follow-up of 33.2 ± 22.8 months. The mean preoperative coronal Cobb angle was 65.5° ± 25.7°, which corrected to 20.3° ± 14.4°, translating into a 69% correction ($p < 0.05$). The preoperative coronal balance was 24.4 ± 22.6 mm, with a postoperative measurement of 21.6 ± 20.7 mm ($p = 1.00$). Preoperative pelvic obliquity was 12.7° ± 8.7°, which corrected to 4.1° ± 3.8°, translating into a 68% correction ($p < 0.05$). Preoperative shoulder balance, as measured by the clavicle angle, was 8.2° ± 8.4°, which corrected to 2.7° ± 3.1° (67% correction, $p < 0.05$). Preoperatively, thoracic kyphosis measured 44.2° ± 23.7° and was 33.8° ± 11.5° postoperatively. Thoracolumbar kyphosis was 18.7° ± 12.1° preoperatively, reduced to 8.1° ± 7.7° postoperatively, and measured 26.8° ± 20.2° at the last follow-up ($p < 0.05$). Preoperatively, lumbar lordosis was 35.3° ± 22.0°, which remained stable at 35.6° ± 15.0° postoperatively.

Pedicle screw constructs appear to provide better correction of coronal parameters than historically reported and provide significant improvement of sagittal kyphosis as well. Although pedicle screws

appear to provide good radiographic results, correlation with clinical outcomes is necessary to determine the true impact of pedicle screw constructs on SCI-related scoliosis correction [1)].

Acutely, seizures may elevate ICP, and may adversely affect blood pressure and oxygen delivery, and may worsen other injuries (e.g. spinal cord injury in the setting of an unstable cervical spine).

Stress ulcer

see Stress ulcer

Deep-vein thrombosis

Deep-vein thrombosis

Neuropathic pain

see Neuropathic Pain After Spinal Cord Injury

1)
Hwang SW, Safain MG, King JJ, Kimball JS, Ames R, Betz RR, Cahill PJ, Samdani AF. Management of spinal cord injury-related scoliosis using pedicle screw-only constructs. J Neurosurg Spine. 2015 Feb;22(2):185-91. doi: 10.3171/2014.10.SPINE14185. Epub 2014 Nov 21. PubMed PMID: 25415486.