

Pediatric cervical deformity

The pediatric [cervical deformity](#) is a complex [disorder](#) often associated with neurological deterioration requiring cervical [spine fusion](#). However, limited [literature](#) exists on new perioperative neurological deficits in [children](#). A study of Verhofste et al. describes new perioperative [neurological deficits](#) in pediatric cervical spine [instrumentation](#) and [fusion](#).

A single-center [review](#) of pediatric [cervical spine instrumentation](#) and [fusion](#) during 2002-2018 was performed. Demographics, surgical characteristics, and neurological [complications](#) were recorded. Perioperative neurological deficits were defined as the deterioration of preexisting neurological function or the appearance of new neurological symptoms.

A total of 184 cases (160 patients, 57% male) with an average age of 12.6 ± 5.30 years (range 0.2-24.9 years) were included. Deformity (n = 39) and instability (n = 36) were the most frequent indications. Syndromes were present in 39% (n = 71), with [Down syndrome](#) (n = 20) and [neurofibromatosis](#) (n = 12) the most prevalent. Eighty-seven (48%) children presented with preoperative neurological deficits (16 sensory, 16 motor, and 55 combined deficits). A total of 178 (96.7%) cases improved or remained neurologically stable. New neurological deficits occurred in 6 (3.3%) cases: 3 hemiparesis, 1 hemiplegia, 1 quadriplegia, and 1 quadriparesis. Preoperative neurological compromise was seen in 4 (67%) of these new deficits (3 myelopathy, 1 sensory deficit) and 5 had complex syndromes. Three new deficits were anticipated with intraoperative neuromonitoring changes (p = 0.025). Three (50.0%) patients with new neurological deficits recovered within 6 months and the child with quadriparesis was regaining neurological function at the latest follow-up. Hemiplegia persisted in 1 patient, and 1 child died due a complication related to the tracheostomy. No association was found between neurological deficits and indication (p = 0.96), etiology (p = 0.46), preoperative neurological symptoms (p = 0.65), age (p = 0.56), use of halo vest (p = 0.41), estimated blood loss (p = 0.09), levels fused (p = 0.09), approach (p = 0.07), or fusion location (p = 0.07).

An improvement of the preexisting [neurological deficit](#) or stabilization of neurological function was seen in 96.7% of children after cervical [spine fusion](#). New or progressive neurological deficits occurred in 3.3% of the patients and occurred more frequently in children with preoperative neurological symptoms. Patients with syndromic diagnoses are at higher risk to develop a deficit, probably due to the severity of deformity and the degree of [cervical spine instability](#). Long-term outcomes of new neurological deficits are favorable, and 50% of patients experienced complete neurological recovery within 6 months ¹⁾.

¹⁾

Verhofste BP, Glotzbecker MP, Hresko MT, Miller PE, Birch CM, Troy MJ, Karlin LI, Emans JB, Proctor MR, Hedequist DJ. Perioperative acute neurological deficits in instrumented pediatric cervical spine fusions. J Neurosurg Pediatr. 2019 Aug 16;1-11. doi: 10.3171/2019.5.PEDS19200. [Epub ahead of print] PubMed PMID: 31419801.

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