

Acute flaccid myelitis

Acute flaccid **myelitis** (AFM) is a rare but serious condition that affects the nervous system, particularly the spinal cord. It primarily impacts children and can cause sudden weakness in the arms and legs, along with other symptoms. AFM has been associated with enteroviruses, particularly enterovirus D68 (EV-D68), but the exact cause is not always clear.

Key features of acute flaccid myelitis include:

Sudden Onset of Weakness: AFM typically presents with the sudden onset of weakness in one or more limbs. This weakness can progress rapidly.

Loss of Muscle Tone: "Flaccid" refers to a decrease in muscle tone. Affected limbs may appear floppy and exhibit reduced strength.

Facial Drooping and Weakness: Some individuals with AFM may experience facial drooping or weakness, difficulty moving the eyes, or difficulty swallowing or speaking.

Respiratory Issues: In severe cases, AFM can lead to respiratory failure, requiring ventilatory support.

Pain or Discomfort: Some individuals with AFM may experience pain or discomfort, often in the affected limbs.

AFM has been recognized as a distinct clinical syndrome since around 2014, and periodic outbreaks have been reported. The condition has been associated with various viruses, including enteroviruses and West Nile virus, but a specific cause is not always identified.

Diagnosis of AFM involves clinical and neurologic evaluations, as well as imaging studies such as magnetic resonance imaging (MRI) of the spinal cord. There is no specific treatment for AFM, but supportive care, physical therapy, and rehabilitation may be beneficial.

As AFM is a rare condition, it's essential for healthcare providers and the public to be aware of its symptoms, especially during periods when there is an increased incidence of viral infections. If someone is suspected of having AFM, it's crucial to seek medical attention promptly for evaluation and appropriate management.

Nerve transfer surgery is sometimes offered to patients with acute flaccid myelitis (AFM). The objectives of this study were to evaluate surgical efficacy, assess which clinical and neurophysiological data are valuable for preoperative planning, and report long-term outcomes.

Methods: This is a single-center, retrospective case series of patients with AFM who received nerve transfer surgery. All patients had preoperative electromyography and nerve conduction studies (EMG/NCS). Matched control muscles that did not receive nerve transfer surgery were defined in the same cohort.

Results: Ten patients meeting inclusion criteria received a total of 23 nerve transfers (19 upper extremity, four lower extremity). The mean age at symptom onset was 3.8 years, surgery was 0.5 to 1.25 years after diagnosis, and mean follow-up was 2.3 years (range 1.3 to 4.5 years). Among muscles with preoperative strength Medical Research Council (MRC) grade 0, muscles receiving nerve

transfers performed significantly better than those that did not (MRC grade 2.17 ± 0.42 vs 0 ± 0 , respectively, $P = 0.0001$). Preoperative EMG/NCS predicted worse outcomes in recipient muscles with more abundant acute denervation potentials ($P = 0.0098$). Donor nerves found to be partially denervated performed equally well as unaffected nerves. Limited data suggested functional improvement accompanying strength recovery.

Conclusions: Nerve transfer surgery is an effective strategy to restore strength for patients with AFM with persistent, severe motor deficits. Postoperative outcomes in patients with complete paralysis are better than the natural history of disease. This study demonstrates the utility of preoperative clinical and electrophysiological data in guiding patient selection for nerve transfer surgery. ¹⁾

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Rivera GS, Stokum JA, Dean J, Sadowsky CL, Belzberg AJ, Elrick MJ. Nerve Transfer Surgery in Acute Flaccid Myelitis: Prognostic Factors, Long-Term Outcomes, Comparison With Natural History. *Pediatr Neurol*. 2023 Oct 31;150:74-81. doi: 10.1016/j.pediatrneurol.2023.10.019. Epub ahead of print. PMID: 37981447.

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