

Nerve reconstruction

During nerve [reconstruction](#), [nerves](#) of different thicknesses are often sutured together using end-to-side [neurorrhaphy](#) and end-to-end neurorrhaphy techniques. In a study, the effect of the type of neurorrhaphy on the number and diameter of regenerated axon fibers was studied in a rat facial nerve repair model. An inflow-type end-to-side and end-to-end neurorrhaphy model with nerve stumps of different thicknesses (2:1 diameter ratio) was created in the facial nerve of 14 adult male Sprague-Dawley rats. After 6 and 12 weeks, nerve regeneration was evaluated in the rats using the following outcomes: total number of myelinated axons, average minor axis diameter of the myelinated axons in the central and peripheral sections, and axon regeneration rate. End-to-end neurorrhaphy resulted in a significantly greater number of regenerated myelinated axons and rate of regeneration after 6 weeks than end-to-side neurorrhaphy; however, no such differences were observed at 12 weeks. While the regenerated axons were thicker at 12 weeks than at 6 weeks, no significant differences in axon fiber thickness were detected between end-to-end and end-to-side neurorrhaphy. Thus, end-to-end neurorrhaphy resulted in greater numbers of regenerated axons and increased axon regeneration rate during the early postoperative period. As rapid reinnervation is one of the most important factors influencing the restoration of target muscle function, we conclude that end-to-end neurorrhaphy is desirable when suturing thick nerves to thin nerves ¹⁾.

Strong scientific validation for nerve reconstructive surgery in infants with [Obstetric Brachial Plexus Palsy](#) is lacking, as no randomized trial comparing surgical reconstruction versus conservative treatment has been performed. A systematic review of the literature was performed to identify studies that compare nerve reconstruction to conservative treatment, including neurolysis. Nine papers were identified that directly compared the two treatment modalities. Eight of these were classified as level 4 evidence and one as level 5 evidence. All nine papers were evaluated in detail to describe strong and weak points in the methodology, and the outcomes from all studies were presented. Pooling of data was not possible due to differences in patient selection for surgery and outcome measures. The general consensus is that nerve reconstruction is indicated when the result of nerve surgery is assumedly better than the expected natural recovery, when spontaneous recovery is absent or severely delayed. The papers differed in methodology on how the cut-off point to select infants for nerve reconstructive surgical therapy should be determined ²⁾.

¹⁾

Tateshita T, Ueda K, Kajikawa A. End-to-end and end-to-side neurorrhaphy between thick donor nerves and thin recipient nerves: an axon regeneration study in a rat model. *Neural Regen Res*. 2018 Apr;13(4):699-703. doi: 10.4103/1673-5374.230296. PubMed PMID: 29722323.

²⁾

Pondaag W, Malessy MJ. The Evidence for Nerve Repair in Obstetric Brachial Plexus Palsy Revisited. *Biomed Res Int*. 2014;2014:434619. Epub 2014 Jan 16. Review. PubMed PMID: 24551845.

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