Neurorrhaphy

Suture of a divided nerve.

During nerve reconstruction, nerves of different thicknesses are often sutured together using end-to-side neurorrhaphy and end-to-end neurorrhaphy techniques.

End to end anastomoses

End to side anastomoses

see Hypoglossal nerve facial nerve neurorrhaphy.

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)].

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.