# Fibrin glue repair leads to enhanced axonal elongation during early peripheral nerve regeneration in an in vivo mouse model.

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## Abstract:

Microsurgical suturing is the gold standard of nerve coaptation. Although literature on the usefulness of fibrin glue as an alternative is becoming increasingly available, it remains contradictory. Furthermore, no data exist on how both repair methods might influence the morphological aspects (arborization; branching) of early peripheral nerve regeneration. We used the sciatic nerve transplantation model in thy-1 yellow fluorescent protein mice (YFP; n = 10). Pieces of nerve (1cm) were grafted from YFP-negative mice (n = 10) into those expressing YFP. We performed microsuture coaptations on one side and used fibrin glue for repair on the contralateral side. Seven days after grafting, the regeneration distance, the percentage of regenerating and arborizing axons, the number of branches per axon, the coaptation failure rate, the gap size at the repair site and the time needed for surgical repair were all investigated. Fibrin glue repair resulted in regenerating axons travelling further into the distal nerve. It also increased the percentage of arborizing axons. No coaptation failure was detected. Gap sizes were comparable in both groups. Fibrin glue significantly reduced surgical repair time. The increase in regeneration distance, even after the short period of time, is in line with the results of others that showed faster axonal regeneration after fibrin glue repair. The increase in arborizing axons could be another explanation for better functional and electrophysiological results after fibrin glue repair. Fibrin glue nerve coaptation seems to be a promising alternative to microsuture repair.