Morphofunctional evaluation of fibrin glue versus microsuture nerve repairs.

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Abstract:

Complications of microsuture repair of peripheral nerves include mechanical trauma, foreign body reaction, impairment of vascularity, and possible obstruction to successful sprouting. In addition, there are occasions when it is virtually impossible to perform a suture repair because of limited exposure and/or very fine structures, such as are encountered in pediatric cases. These situations have continued to provide the impetus for evaluating alternative methods of nerve coaptation. Recently, the use of tissue glue has gained in popularity as a technique for sutureless nerve repairs. We decided to test the efficacy of fibrin glue repair versus microsuture coaptation in the rat sciatic model. The repair sites were assessed for tensile strength, by quantitative morphometry, and by electrophysiologic studies. Tensile strength findings revealed that at two, four, and eight weeks after surgery, there was no significant difference between the two repair techniques, although there was a trend toward a stronger hold in the microsuture repairs. Electrophysiologic recordings revealed that conventional microsuture repairs had significantly faster conduction velocities, larger area under the curve, and higher peak amplitudes. The onset and peak latencies were comparable, revealing that the axonal quality of at least a certain number of axons was similar electrically. Axonal counts both proximal and distal to the repair showed no significant difference, although there was an overall suggestion of superiority in the number of myelinated axons in the suture repair.