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Title

Perfusion to the ulnar nerve as affected by three surgical conditions: in situ decompression, subcutaneous transposition, and submuscular transposition: preliminary results

Purpose

There is lack of evidence to support one surgical treatment for ulnar neuropathy at the elbow over other. No previous studies have demonstrated how these procedures affect the perfusion to the ulnar nerve. The purpose of this study is to compare the perfusion of the ulnar nerve in vivo during different surgical conditions.

Methods

All patients diagnosed with recalcitrant ulnar neuropathy were enrolled prospectively. Using intraoperative fluorescence scanning angiography, the perfusion of the ulnar nerve in each patient was measured at four conditions: native nerve exposure, in situ decompression, subcutaneous transposition, and submuscular transposition, at five locations on each nerve: 8 cm proximal to the medial epicondyle (Area 1); 4 cm proximal to medial epicondyle (Area 2); at medial epicondyle (Area 3); 4cm distal of medial epicondyle (Area 4); and 8cm distal to medial epicondyle (Area 5).

Results

14 patients included 10 males and 4 females; 5 had diabetes and 4 were smokers. Overall, nerve perfusion increased 30% with in situ decompression. Perfusion, however, decreased 16% after subcutaneous transposition as compared to decompression with Areas 4 and 5 demonstrating the most substantial drops (12% and 15% respectively). With submuscular transposition, perfusion returned to decompression values, with Areas 2 and 4 demonstrating the most substantial improvements (10% and 8%, respectively).

Conclusion

In situ decompression appears to be a preferred choice for the purpose of optimizing perfusion to the nerve. When transposition is indicated, however, submuscular may be preferred to subcutaneous, particularly in patients who may have predisposed compromised vascularity such as smokers or diabetics.