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Comments on "Lumbrical Muscles Neural Branching Patterns: A Cadaveric Study With Potential Clinical Implications"

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Dear Editor,

We read with interest the article by Colonna et al[1] in the 2020 issue of *HAND*. The previously reported idea of "babysitting" nerve fiber transfers by providing fibers from a healthy donor trunk to a denervated recipient trunk, to allow these fibers reach the distal effectors to avoid muscle atrophy, is fascinating, especially in high ulnar nerve palsy, as an alternative to tendon transfers to restore the pinch. Unfortunately, distal nerve transfers show inconsistent outcomes,[2] due to many reasons but mainly as an effect of the discrepancy between the number of fibers in donor nerves and those in the recipient one.[3]

A previous study demonstrated the microscopic feasibility of nerve coaptation of the motor branches of the first lumbrical muscles (LM) as donor nerve candidates to restore the function of adductor pollicis muscle (ADP) and to achieve a passing prehensile function.[4]

The authors reported the results of a cadaveric study in 8 patients (5 men and 3 women) demonstrating different LM innervation patterns, in particular the relatively common presence of double branches innervation in 62.5% and dual innervation of the second lumbrical muscle (LM2) in 12.5%.

The multiple innervation pattern and the entry point located in the proximal and middle third of the muscle belly represent an obvious advantage to planning a nerve transfer in the radial side of the palm distal to the exit point of the carpal flexor retinaculum. The problem is that connecting 2 structures lying in different anatomical layers (more superficial lumbrical nerves to deeper distal motor branch of the ulnar nerve or its terminal branch to the adductor muscle) could result in a weak point, as the more superficial flexor and/or deeper adductor contraction could pull both nerve bridge and microsutures.

In the present study, the mean distance from the median nerve to the bifurcation of LM2 was 1.45 ± 0.40 cm and to the entry point in the muscle was 2.58 ± 0.65 cm.

To hypothesize a nerve transfer to the ADP branches of the deep branch of the ulnar nerve from LM2, comparing the aforementioned lengths with the distance between the plane of the first 2 lumbricals and the midpoint of the transverse head of the ADP is mandatory to make the neurotization feasible. Depending on the lengths found, this nerve transfer could be in direct coaptation end-to-end or reverse end-to-side, both sacrificing the innervation to the second lumbrical muscles, or double end-to-side with a bridging graft without denervation of the second lumbrical.

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