**Targeted Muscle Reinnervation in the Lower Leg: An Anatomical Study.**

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**Abstract**

BACKGROUND: Targeted muscle reinnervation reroutes the ends of cut nerves to reinnervate small motor nerves of nearby muscles, with the goal of reducing neuroma pain and/or improving prosthesis function. Anatomical roadmaps for targeted muscle reinnervation have been established in the upper extremity and thigh, but not for the lower leg.

METHODS: The major branch points of motor nerves and the motor entry points to muscles of the leg were dissected in five cadaver specimens. Leg length was defined as distance from the lateral femoral condyle to the lateral malleolus. The distances from the lateral femoral condyle to major branch points and motor entry points were recorded as percentages of leg length to identify targets for targeted muscle reinnervation.

RESULTS: The tibialis anterior and extensor digitorum longus were both acceptable targets in the anterior compartment, with an average 4.4 motor entry points within 10 to 80 percent and 3.0 motor entry points within 20 to 80 percent leg length, respectively. The peroneus longus was the best target in the lateral compartment, with an average 5.8 motor entry points within 20 to 70 percent leg length. The gastrocnemius and soleus were both acceptable targets in the superficial posterior compartment, with an average 4.4 motor entry points within 0 to 40 percent and 6.2 motor entry points within 20 to 80 percent leg length, respectively for each muscle. The flexor digitorum longus was the best target in the deep posterior compartment, with an average 6.0 motor entry points within 30 to 90 percent leg length.

CONCLUSIONS: Targeted muscle reinnervation is technically feasible in the lower leg. This cadaveric study provides a roadmap for incision placement and identification of motor nerve targets.

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