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Appendix 1.

Microsurgical suture repair was used for all grafts with simple 10-0 nylon suture on both proximal and distal nerve ends under a microscope (Wild Heerbrugg Surgical Scope, Model m690). All grafts were 10 mm in length, which was equal to the defect size. In the Group 1 and 3 animals the nerve reconstruction was coapted with 4 to 5 sutures at each end.(Figure 2) In Group 2 animals, five 10 mm segments were cut from the three (one sural nerve from each Group 1, 2, and 3 animal) harvested sural nerves which averaged 25 mm in length. For the cable reconstruction, a single suture was used on each end of the sural nerve graft and coapted to the injured nerve. Cables were placed until the diameter defect was approximated which was either 4 or 5 cables.

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Appendix 2.

In brief, the leg was stabilized on a custom testing block and the tibialis insertion was attached to a force transducer (Model GM, Honeywell, Columbus, OH) with 2-0 vicryl suture. The signal from the force transducer was sent to a PowerLab amplifier (PowerLab 4/35, AD Instruments, Colorado Springs, CO) that recorded the force changes in a software program (LabChart v8.0.5, AD Instruments, Colorado Springs, CO) on a personal computer. Nerve stimulation was performed with a Stimulus Isolator (AD Instruments) head unit with a miniature bipolar stimulating electrode proximal to the nerve injury site. Stimulus frequency was 60 Hz, intensity was 9 mA and duration was 1 ms. This procedure was performed bilaterally and in the control, nonsurgical limb the sciatic nerve was stimulated 10 mm proximal to the trifurcation.

Appendix 3.

After induction of general anesthesia, each animal was placed on the testing block in prone position. Using the same dorsal approach as the previous surgical procedure, the main sciatic nerve was exposed. Nerve stimulation was performed with a Stimulus Isolator (AD Instruments) head unit with a miniature bipolar stimulating electrode proximal to the nerve injury site. Bipolar recording electrodes were placed in the gastrocnemius, and a grounding electrode was placed in the ipsilateral gluteus maximus muscle. The compound muscle action potentials were measured from the gastrocnemius muscle using a Powerlab 8/30 data acquisition unit and LabChart software v7.1 (both AD Instruments, Colorado Springs, Co) on a personal computer. Stimulation duration was 0.04 ms, frequency 1 Hz, and stimulus intensity of 0.4 mA to elicit a compound muscle action potential signal. Exposure and measurements were also repeated for the contralateral side.