



Comparative study of laser and scalpel nerve transections.

Authors

Fligny I, Wu JS, Samonte BR, et al.

Source

Lasers Surg Med 1992; 12(1) :43-50.

Abstract

This investigation was designed to compare standard scalpel transections of the tibial branch of the rat sciatic nerve with those performed using either a milliwatt carbon dioxide (CO₂) or a potassium titanyl phosphate (KTP/532) laser. Four transection groups consisted of nerves sectioned with (1) scalpel (control), (2) milliwatt CO₂ laser, (3) KTP/532 with microscope attachment, and (4) KTP/532 laser with 400-microns bare fiber. Each laser was used with the same parameters: 10 watts, 0.4-mm spot size, and continuous-wave mode. Horseradish peroxidase (HRP) was applied to the proximal stump for 30 min, and the animals were sacrificed 24 h later. Horseradish peroxidase (HRP)-labeled motoneuron cell bodies in the lumbar spinal cord were then counted. The average numbers of labeled neurons in each group were as follows: group I (n = 14) 518, group II (n = 8) 424, group III (n = 8) 351, and group IV (n = 8) 283. The standard deviations were quite large, however. When all laser transections were pooled and compared with paired scalpel transections, we found a significant difference, both by the paired t-test (P = 0.016) and by the Wilcoxon matched-paired test (P = 0.02). We conclude that laser transection significantly diminishes the number of neurons labeled by the retrograde transport of HRP.

Mesh

Animals
Axonal Transport
Carbon Dioxide
Female
Horseradish Peroxidase
Laser Therapy
Motor Neurons
Neural Pathways
Neurons
Phosphates
Rats
Rats, Inbred Strains
Sciatic Nerve
Spinal Cord
Surgical Instruments
Tibia
Titanium

Language

eng

Pub Type(s)

Comparative Study Journal Article Research Support, Non-U.S. Gov't

PubMed ID

1377320