DOI:10.16016/j.1000-5404.1991.05.015

Morphometric study of the plasticity of nerve fibers of spared spinal dorsal root and its terminals in rats

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Abstract The number of nerve fibers in the spared dorsal root of the L_4 spinal nerve and the number of nerve terminals in the Lamina III of the segment of the spinal cord between L_2 and S_1 were determined with electron microscopic morphometry, and the distribution and density of nerve fibers in the spinal cord were observed with silver staining. It was found that the distribution and density of nerve fibers in the spinal cord showed no difference between the operated and the control sides under optical microscopy; morphometric analysis revealed a significant increase of the number of unmyelinated fibers and a tendency to increase of their diameter; and the number of both simple and complex terminals in the Lamina III of the spinal cord could return to the normal level on the 35th day after operation with a significant increase of their diameter. The importance of these changes was preliminarily discussed.

Key words spinal cord; ganglia, spinal; nerve endings; plasticity; morphometry; rat

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HLC—I型生物活组织力学试验机的研制及其应用

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目前国内外生物力学试验多为离体的生物组织试验。由于离体生物组织丧失了神经和体液因素的调控作用，不能表现出生命活体在原位状态下的力学性质。因而难以提供准确的生物力学参数。随着临床应用、生物医学工程应用和军事医学研究的发展，设计在体生物力学试验仪器，创建活体的生物力学试验方法，已成为十分迫切的研究课题。本文作者根据力学的基本原理，针对生物医学的特点设计研制了HLC—I型生物活组织力学试验机，于1991年9月26日在重庆通过专家鉴定。

该机在设计上采用计算机接口技术，实现了加载、卸载，负荷检测，位移记录，结果打应等测试全过程的自动化。首次设计了轴向拉伸定向器、弦式加载定向器、轴平行动物台和轴垂直动物台，实现了生物软组织的活体原位力学测试的功能。已用于大白鼠坐骨神经和兔颈总动脉的活体原位的生物力学试验，并可用于临床手术时一些组织（如血管、神经等）张力缝合作为监护仪器。该机还设计了模拟生理和病理环境的装置，具有进行离体生物组织器官的拉伸和压力试验的功能。已用于人脑血管的生物力学试验。而且也可用于若干工业材料的力学试验，特别适用于轻纺材料的力学试验。

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