The rabbit brachial plexus as an experimental model – anatomy and surgical approach

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Abstract

The aim of our study was to analyze the anatomy and surgical approach of the rabbit brachial plexus. The research included 18 rabbits. The rabbit seems to be a good experimental model for spinal nerves injury, especially for the C5 and C6 segments. The anatomical structure of the rabbit's brachial plexus is similar to the human brachial plexus. The structure of the rabbit C5 and C6 segments is analogous to the human structure. The spinal nerves of the C5 and C6 segments in the rabbit are wide and long enough for microsurgical procedures.

Key words: spinal nerves, ventral root, brachial plexus, rabbit

Introduction

High peripheral nerve injury despite of the development of medicine and ongoing research still remains a serious problem. This type of lesions can be divided into pre- and postganglionic. The post-ganglionic injury can be divided into neurotmesis, axonotmesis and nerapraxis (Seddon 1943). The neurotmesis is injury of the whole nerve's structure, axonotmesis is injury of the axon and partial loss of function without structural changes in the nerve is neuropraxis. In the two first cases the changes occur of degenerative and non-degenerative type. A typical picture of breaking the connection between the nerve cell and axon is disintegration with axonal dieback on peripheral parts. This process is called Walerian’s degeneration. In the case of preganglionic injury (usually avulsion of the roots of the spinal nerves the changes came from peripheral nervous system and spinal cord. This leads to a complete loss of sensory and motor function (Vekris and Soucacos 2001).

In the case of damage of the supraclavicular and infraclavicular area basic methods of treatment include neurolysis, direct neurorrhaphy (end to end), or