14 - Neuroanatomy

OC-053 - (23904) - A MODEL OF FREE NEUROTIZED TISSUE TRANSFER - THE RAT SENSATE EPIGASTRIC FREE FLAP

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Sensory recovery is a fundamental outcome in breast reconstruction surgery. Research suggests that neurotization of abdominal wall-based flaps can enhance and accelerate the recovery of sensation after breast autologous reconstruction. However, the complexity of the various steps involved often discourages surgical trainees. Understanding the detailed neuroanatomy of these flaps is crucial for improving outcomes. The anatomy of the rat's epigastric flap is reasonably well described, making it a suitable model for microsurgical research and training due to its good anatomical similarity to humans. However its microscopic morphology remains unclear. This study aims to describe the neurohistology of the rat’s sensate epigastric flap.
An observational cross-sectional study included twenty murine models. Anatomical dissection was performed on the caudal epigastric nerve exiting the epigastric flap, as well as the 10th, 11th, and 12th intercostal. Nerve samples were histologically processed, incorporating Hematoxylin-eosin and Masson's trichrome staining, as well as immunohistochemistry with anti-neurofilament antibodies for neuronal identification, peripherin for sympathetic nerve fibers, and annexin V for sensory nerve fibers. Our microscopic investigation focused on the comprehensive characterisation of neuronal structures, particularly nerve terminals, related to this model of free neurotized tissue transfer.

Gathered samples provided a comprehensive characterisation of the caudal epigastric and last intercostal nerves, which are the primary nerves used for model flap neurotization.

These results uncover significant neuroanatomical similarities between rats and humans regarding the innervation of the ventrolateral aspect of the abdominal integument, amplifying the utility and impact of this model to surgical training and research in breast reconstructive surgery.

Palavras-chave : Neurohistology, DIEP, Sensation