3 - Clinical Anatomy

OC-066 - (23905) - NEUROHISTOLOGICAL CHARACTERIZATION OF THE RAT EPIGASTRIC FLAP - A USEFUL MODEL FOR SURGEONS

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Sensory recovery is a crucial outcome in breast plastic surgery. Abdominal wall-based flaps are gold standard for autologous breast reconstruction, but neurotization, key to enhancing sensory recovery, is underutilized due to its complexity. Understanding the detailed anatomy and neuroanatomy of these flaps is essential for improving outcomes. Additionally, experimental microsurgical training using animal models is essential for developing proficiency. Despite their anatomical similarities to humans, the neurohistology of the rat neurotized epigastric model remains poorly characterized. The goal of this research was to characterize the neurohistology of the rat's epigastric flap.

An observational cross-sectional study was performed on twenty murine models. Samples of epigastric flap skin were collected and histologically prepared, including staining with hematoxylin-eosin and Masson's trichrome, and immunohistochemistry using anti-Neurofilament antibodies for neuronal marking, Peripherin (sympathetic nerve fibers), Annexin V (sensory nerve fibers) and anti-PIEZO2 (cutaneous mechanoreceptors). Microscopic analysis focused on description of the following flap skin features: layers; number, types, and diameters of nerve fibers, classification and density of the cutaneous receptors, and their distance from the dermo-epidermal junction.

Collected samples enabled a comprehensive characterization of the skin's neurohistology and sensory receptors, complementing the extensive documentation of the flap's vascularization.

The findings reveal a substantial similarity between the neuronal structures within the skin of rats and the human ventrolateral abdominal intertegument. This similarity supports the use of the rat neurotized epigastric flap as a valuable model for studying sensate tissue transfer and for improving surgical training and research in plastic surgery.

Palavras-chave : breast reconstruction, rat model, flap neurotization