

Developing an Optimal Experimental Model for Immunological Studies in VCA: Vascularized Composite Allotransplants Based on Femoral Vessels in Rats

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ABSTRACT

Vascularized composite allotransplantation (VCA) has become a recent therapeutic entity in reconstructive surgery. Long term immunosuppressive therapy ensures graft survival, although, with a risk of serious side effects. Further progress in this field depends on better understanding of basic immunology of composite tissue grafts with the dynamics of rejection and possibilities to induce donor specific-tolerance. Without a vast clinical experience, a possibility for achieving those goals is intensive study in preclinical field. The classical experimental model for VCA is rat hind limb transplantation. We analyzed several microsurgical models in order to determine the most adequate one for immunological studies. We performed both orthotopic and heterotopic hind limb transplantations (we tested different techniques: entire or partial hind limb allotransplantation) and also osteomyocutaneous flaps (with different bone components), noting their advantages and limits. The osteomyocutaneous flap is less morbid and represents a promising experimental model in VCA studies. Also we analyzed other models including epigastric flap allotransplantation and abdominal wall transplant for determine their utility as experimental models for immunological studies.

Key words: rat model immunological studies, hind limb allotransplantation, epigastric flap, hemi-abdominal wall, vascularized composite allotransplantation