retrograde IMV except one patient who used the IMV and an IMV perforator. Over the time period, there was an increasing use of perforator DIEP and SIEA flaps as well as the use of the IMV as recipients. Complications included delayed wound healing (n=5), abdominal bulge (n=2), cellulitis (n=3), seroma (n=2), and fat necrosis (n=3). There was one partial flap loss where the SIEA portion of the bipedicle flap was lost.

CONCLUSIONS: Bipedicle flaps can be performed as two free flaps safely and reliably. Use of DIEP flaps maximizes pedicle length and the IMV can be used reliably in an antegrade and retrograde fashion to perfuse both components of the bipedicle flap.

8.20 Circumflex Scapular Artery Vascularized Scapular Chimeric Flaps: A New Experimental Flap Model

Arzu Akcal, Tahsin Gorgulu, Seckin Aydin Savas, Ibrahim Bassorgun
Antalya, Turkey

INTRODUCTION: Experimental in vivo models still mean important tool for biomedical research. The aim of study is to introduce a novel circumflex scapular artery myocutaneous/vascularized scapular chimeric flap model in rat and demonstrated a optimal skin flap dimensions.

MATERIALS AND METHODS: An 8x4 cm rectangular skin flap based on circumflex scapular artery flap were harvested and the mean percentages of surviving flap area and necrotic area are calculated. Using the flap dimensions determined in Part I, a 4x3 cm quadrangular skin is marked over the scapula and the serratus anterior muscle and partial scapular bone were included in chimeric flap model.

RESULTS: Microangiographic and histologic studies revealed the vascularity of the skin island, identified the branches of circumflex scapular artery to bone and muscle.

CONCLUSIONS: The circumflex scapular artery myocutaneous/vascularized partial scapular chimeric flap may be considered as branch based chimeric flap and it can be good flap model because of its simplicity, reliability, and consistent vascularity. Also this flap has potential applications in the study of chimeric flap hemodynamics.

8.30 Subnormothermic Machine Perfusion (SNMP) with a Novel Hemoglobin-Based Oxygen Carrier (HBOC) Solution for Ex Vivo Preservation in Vascularized Composite Allograft Transplantation (VCA)

Riccardo Schweizer, Sinan Oksuz, Barak Banan, Vijay Gorantla, Paulo Fontes
Zurich, Switzerland

INTRODUCTION: Improved preservation techniques could reduce ischemia-reperfusion injuries (IRI), ameliorate the immunological outcome and allow improved matching and allocation of VCA grafts across wider distances. A novel SNMP system was evaluated for ex vivo preservation of VCA.

MATERIALS AND METHODS: Swine vertical rectus abdominis muscle (VRAM) flaps were preserved for 14h with cold static preservation at 4°C (CSP; n=8) and SNMP at 21°C using HBOC (n=8). Technical feasibility studies of ex vivo SNMP where followed by in vivo studies in heterotopic (cervical) VRAM allotransplantation followed for 7 days under triple immunosuppression. In addition to recipient’s clinical, histopathological and serum myoglobin monitoring, inflammatory markers and metabolomic analyses were performed on perfusates/tissues.

RESULTS: SNMP provided low pressures (50–55 mmHg), low flows (25–60 ml/min) and full oxygenation (FiO2=60% at 400 ml/min) to flaps. SNMP stabilized perfusate’s pH (7.55. 7.6) while keeping lactate levels under 4 mmol/L. Inflammatory cytokine profiles showed no significant difference between the groups ex vivo. Muscle fiber disruption and necrosis were significantly reduced in the SNMP group. Early contraction bands were followed by moderate to severe IRI in the CSP flaps in vivo. Myoglobin blood levels were significantly higher in CSP flap recipients. Metabolites involved in pentose (nucleic acid
back-bone) metabolism were significantly higher after SNMP: ribose (.22-folds, p<0.001), ribonate (.37-folds, p<0.001), and ribitol (.10.5-folds, p<0.001). Glycolysis metabolites increased during SNMP: glucose-6-phosphate (.23-folds, p=0.01), fructose-6-phosphate (.12-folds, p=0.03), and phosphorenolpyruvate (.8-folds, p=0.03). Antioxidant pathways were fully functional after SNMP: glutathione-cysteine disulfide (.5.6-folds, p=0.01) and N-acetylcysteine (.40-folds, p=0.007). Energy-related metabolites were significantly higher in SNMP flaps: cAMP (.3.7-folds, p=0.02) and adenosine (.129-fold, p=0.002).

CONCLUSIONS: SNMP/HBOC provides effective ex vivo oxygenation of VRAM allografts. SNMP significantly decreases IRI and post-transplant inflammation compared to CSP. SNMP/HBOC may help mitigate IRI, enabling long-distance graft sharing or tandem VCA.

8.40 INTRA-GRAFT INJECTION OF TACROLIMUS MAY MODULATE LOCAL IMMUNE RESPONSE PROMOTING LONG-TERM ACCEPTANCE OF VCA IN A MODIFIED BROWN NORWAY TO-LEWIS TRANSPLANTATION MODEL

Radu OLARIU, Adriano TADDEO, Frank Marie LECLÊRE, Mihai Adrian CONSTANTINESCU, Esther VÖGELIN

Bern, Switzerland

INTRODUCTION: Side effects associated with systemic immunosuppression remain a pacing-limiting obstacle to widespread adoption of vascularized composite allotransplantation (VCA). Unlike most solid organ transplantations, VCA offer unique possibilities to monitor rejection and deliver immunosuppressive drugs directly into the graft, in particular into the skin, the most immunogenic components in the VCA. We hypothesized that local delivered immunosuppressant may modulate the regional immune response and inflammatory milieu influencing the rejection process.

MATERIALS AND METHODS: In order to analyze the therapeutic and immunomodulatory efficacy of locally delivered immunosuppression we performed a modified Brow Norway-to-Lewis rat hind-limb transplantation model with inclusion of the vascularized inguinal lymphatic tissue in the graft. The day after the operation the rats were treated with a single sub-cutaneous injection of 7mg tacrolimus into the transplanted limb.

RESULTS: Tacrolimus treatment significantly prolonged graft survival as compared to untreated animals (n=12 median survival 152.5 days; n=9 median survival 11 days, respectively). Interestingly, 50% of the rats survived for an average of 70.5 days and the other 50% remained rejection-free for more that 200 days without any further intervention. This dichotomy was associated neither with differential levels of systemic or intra-graft tacrolimus, nor with induction of tolerance (analyzed by mixed lymphocyte reaction, or secondary challenge with skin-graft). Notably, a better preservation of circulating Treg after therapy and a long-lasting macro-chimerism were observed in the long-term surviving rats.

CONCLUSIONS: Our data show that locally administered immunosuppression may induce an immunomodulatory milieu within the graft able to promote the long-term acceptance of VCA in a modified lymph node-including model of allotransplantation. This study suggests that the therapeutic modulation of the regional immunity may influence the outcome of VCA and underline that tissue-specific immunoresponse warrants further investigation in VCA.

8.50 DISPLAYING INGUINAL LYMPH NODES BEFORE TRANSPLANTATION IN A DEEP INFERIOR EPIGASTRIC PERFORATOR FLAP BREAST RECONSTRUCTION USING AN INNOVATIVE PROJECTION METHOD

Stefan HUMMELINK, Leo SCHULTZE KOOL, Dietmar ULRICH

Nijmegen, The Netherlands

INTRODUCTION: Lymphedema of the arm is a common postoperative complication as a result of breast cancer surgery. One of the surgical treatments comprises modification of a deep inferior epigastric perforator ( DIEP) flap breast