11.40 CELL ASSISTED LIPOTRANSFER -THE INTERACTION BETWEEN ADIPOSE DERIVED STEM CELLS AND MAMMARY EPITHELIAL CELLS

Annika WEIGAND, Anja M. BOOS, Justus P. BEIER, Reiner STRICK, Raymund E. HORCH

Erlangen, Germany

INTRODUCTION: Lipofilling is gaining more and more popularity in plastic surgery. However, currently the tumorigenicity and angiogenic properties of liposapirates for correction of volume defects after breast conserving therapy, is discussed controversially. To assess the safety of lipotransfer into remaining breast tissue, the interaction of primary adipose derived stem cells (ADSC) and mammary epithelial cells (MEC) is evaluated in this study.

MATERIAL AND METHODS: MEC and ADSC were isolated from human breast tissue and characterized by immunohistochemistry, real-time PCR and differentiation. Paracrine and cell-cell interactions of ADSC and MEC were evaluated using ADSC conditioned medium (CM) and direct/indirect co-cultures. A range of functional analyses of MEC was performed such as migration, transmigration, proliferation, invasion as well as gene expression of MEC. The secretion profile of ADSC was analyzed using an antibody array/ELISA.

RESULTS: Protocols for isolation and characterization of MEC and ADSC from breast tissue could be established successfully. Transmigration of MEC significantly increased when cultivated in ADSC CM while 2D migration and proliferation increased moderately. Preliminary results revealed cell fusions of ADSC and MEC in co-cultures. In ongoing experiments changes of gene expression of MEC after ADSC stimulation are investigated. Analysis of ADSC CM revealed distinct proteins and growth factors that could be responsible for MEC stimulation, e.g. fibronectin, II-6, MCP-1, Clusterin, and ENPP2.

CONCLUSIONS: A more detailed understanding of ADSC-MEC interactions would help to assess the risk of using ADSC for regenerative purposes such as lipotransfer into remaining breast tissue after tumor excision. Finally these results indicate that ADSC are capable of transforming MEC into a stimulated stage. Further studies are required to evaluate the potential risk of cell-assisted lipotransfer directly inducig breast cancer recurrence as well as de novo formation. Moreover, detailed assessments of the cell-cell interplay could be decisive for developing new breast cancer therapies.

11.50 ENHANCING POTENTIAL TERRITORIES OF THE LATERAL THORACIC ARTERY BASED PERFORATOR FLAP VIA INJECTIONS OF ADSC

Arzu AKÇAL, Seçkin Aydin SAVAS, Gamze TANRIOVER, Nuray ERIN

Antalya, Turkey

INTRODUCTION: Single lateral thoracic artery perforator based lateral thoracic artery perforator flap has known anatomical, dynamic and the potential territories. The most cranial perforator of lateral thoracic vessels can nourished entire dorsal island flap and it was known that it has 92 % survival rate. The flap necrosis usually occurs in the contralateral lateral thoracic artery territories and it was known that lateral thoracic artery perforator based flap is does not anastomose with its counterpart. Adipose-derived stem cells (ADSC) secreted trophic factors (cytokines) exhibiting functions such as angiogenesis, anti-inflammatory and antiapaptotic. There has been no report so far on local effects of adipose-derived stem cells (ADSCs) on enhancing flap survival on perforator-based flaps. The effect of adipose tissue-derived stem cell injection on survival of flap via enhancing of blood supply of potential territories of perforator-based flap was shown.

MATERIALS AND METHODS: Adipose-derived stem cells were isolated from the groin region of Sprague-Dawley rats and expanded ex vivo for 3 passages. The characterization of mesenchymal stem cells cultured via isolation from the adipose tissue will be proven via flow cytometry analyses and differentiation into adipocytes, chondrocytes and osteoblasts. Animals were divided into 2: ADSC injected, PBS injected and noninjected groups. The most cranial perforator of lateral thoracic vessels were defined and flaps were harvested...
ADSCs were then injected to contralateral lateral thoracic artery territories where the flap necrosis usually occurs. At postoperative day 7, flap viability measurement and tissue harvest for histologic and immunocytochemical assessment were performed in all groups.

RESULTS: The flap viability increased in ADSCs injected group compared with PBS and non-injected group small but not statistically significantly increase in vessel count per field.

CONCLUSIONS: These findings suggest that ADSCs have a potential for enhancing the blood supply of potential territories of perforator flaps.

12.00 EFFECT OF NON-EXPANDED ADIPOSE STROMAL VASCULAR FRACTURE ON VIABILITY OF TRANSVERSE RECTUS ABDOMINIS MUSCULOCUTANEOUS FLAP AFTER ABDOMINOPLASTY: EXPERIMENTAL STUDY

Erhan COSKUN, Huseyin BORMAN, Cagri Ahmet UYSAL, Burak OZKAN
Adana, Turkey

INTRODUCTION: A prior abdominoplasty is generally considered as an absolute contraindication to transverse rectus abdominis musculocutaneous (TRAM) flap surgery. The aim of this study is to investigate the effect of non-expanded adipose stromal vascular fracture (ASVF) on viability of TRAM flap after abdominoplasty.

MATERIALS AND METHODS: 35 male Sprague Dawley rats were divided into 5 groups; each group consisted of 7 rats. Reverse abdominoplasty model was used in all groups except group 1 (Only TRAM flap). Right inferior epigastric artery pedicled, 5x2.5 cm sized TRAM flap was performed 2 weeks after abdominoplasty in groups 2 and 4 and 4 weeks after in groups 3 and 5. ASVF cells were injected locally during abdominoplasty in groups 4 and 5. The viable flap area percentage was assessed by pixel count, newly formed perforators by surgical microscope, vessel count by microangiographic imaging, capillary density and fibrosis gradient by histopathological analysis and ASVF cells marked with DiI by fluorescent microscope. Additionally, plasma VEGF levels were measured.

RESULTS: The mean viable flap area to total flap area was measured as 82.90±7.59 %, 3.31±3.29 %, 9.40±6.18 %, 31.92±9.29 %, 64.98±10.95 % in group 1, group 2, group 3, group 4 and group 5 respectively (p<0.05). The number of newly formed musculocutaneous perforating arteries were 0.29±0.49, 1.14±0.69, 2±0.82 for groups 3, 4 and 5 respectively (p<0.05). Mean capillary density was 6.86±0.50, 0.67±0.13, 2.79±0.53, 3.71±0.47, 7.01±0.70 in groups 1, 2, 3, 4 and 5 respectively (p<0.05). There was a statistically significant increase between the baseline VEGF values and the second VEGF values in groups 4 and 5.

CONCLUSIONS: The results of this experimental study showed that local injection of ASVF increases viability of TRAM flap after abdominoplasty.

12.10 REPAIR OF CRITICAL SIZE DEFECTS USING BIOACTIVE GLASS SEEDED WITH ADIPOSE-DERIVED MESENCHYMAL STEM CELLS

Zeynep AKDENIZ, Bülent SAÇAK, Betul KARADEMIR, Feriha ERCAN, Ozhan CELEBILER
Istanbul, Turkey

INTRODUCTION: Bioactive glass has been demonstrated as a biocompatible bone substitute. However bone healing process can be prolonged due to late resorption of the material. Adipose derived stem cells (ASC) have osteogenic differentiation potential and therefore can be a cell source for bone regeneration. The aim of this study was to assess whether a biocompatible construct such as bioactive glass with osteoconductive and osteostimulatory properties would be a suitable delivery carrier for ASCs and hence increase bone regeneration.

MATERIALS AND METHODS: Following creation of critical sized defects on the calvaria of 32 Wistar rats, the animals were randomly divided into four groups: Group C (control): Defects were left untreated; Group G: Defects were covered with autologous bone graft; Group BG: Defects were