CONCLUSIONS: Best results of study were obtained in young children. Joint stiffness plays an important role in functional improvement. Type of procedure has no relation with outcome of surgery, without any significant difference between two countries.

9.50 PERFORATOR MAPPING AND OPTIMIZING DESIGN OF THE LATERAL ARM FLAP: ANATOMY REVISITED AND CLINICAL EXPERIENCE

Edward CHANG, Amir IBRAHIM, Alexander NGUYEN, Hiroo SUAMI, Peirong YU
Houston, USA

INTRODUCTION: The lateral arm flap remains an underutilized flap especially as a free flap. Here, we describe the perforator anatomy to optimize flap design and harvest.

MATERIALS AND METHODS: Perforator locations were mapped in 12 cadavers (24 arms), including a retrospective review of 51 patients undergoing a lateral arm flap.

RESULTS: One to 3 reliable perforators supply the lateral arm flap. Based on cadaveric dissections, from the deltotid insertion, the A, B, and C perforators were located at 7.2±1.0cm, 9.9±1.2cm, and 11.8±0.8cm which was 0.44, 0.61, and 0.72 of the distance from the deltotid insertion respectively. The average pedicle length was 7.0±1.1cm. The cadavers were entirely symmetric in the number and location of the perforators between the right and left arms. All 51 patients (24 male and 27 female) had at least one perforator with an average pedicle length of 7.0±1.3cm, average arterial diameter of 1.7±0.3mm and vein diameter of 2.5±0.5mm. All but one flap was performed as a free flap for head and neck reconstruction with one pedicled flap for shoulder reconstruction. The average flap size was 72.2±37.1cm² (range: 21-165cm²). The non-dominant arm was used for all free flaps. There were no total or partial flap losses. Twenty-eight patients reported donor site numbness, with one infection, one hematoma, and one wound dehiscence.

10.00 TIME LAPSE IMAGING OF HUMAN NEURONS CO-CULTURED WITH CANINE OLFACTORY ENSHEATHING CELLS AND SCHWANN CELLS ON 3D SPIDER SILK CONSTRUCTS

Desiree SCHRÖDER, Peter VOGT, Christine RADTKE
Hannover, Germany

INTRODUCTION: Transplantation of myelin-forming cells such Olfactory Ensheathing (OECs) and Schwann Cells (SCs) into traumatic spinal cord injuries (SCI) can notably improve functional outcome in experimental models. It is assumed that intrinsic repair is supported by providing extra cell transplantation combined with ideally structured microenvironments at the site of injury. Spider silk is a proteinaceous fibre with low immunogenicity and high support of cell physiology, thus a suitable microenvironment. We determined in vitro characteristics of NT2s co-cultured with canine OECs and SCs, additionally seeded on spider silk constructs.

MATERIALS AND METHODS: Native spider silk from Nephila edulis transferred on frames provide a 3D structure. Successfully differentiated NT2s were seeded onto spider silk frames. After settling, canine OECs and SCs were added individually. To analyse interaction of the co-culture, time lapse recordings with were photographically documented every 5 minutes.

RESULTS: The images show that NT2s survive, integrate and align on spider silk fibres. Also, the co-culture reveals a distinct potential of interaction in vitro. Moreover, extensive migration of canine OECs can be observed on spider silk, whereas fibres are used as a scaffold on which long filopodia are formed. Typical characteristics of NT2 and canine OECs as well as canine Schwann Cells are expressed.
CONCLUSIONS: NT2s seeded onto spider silk in a co-culture model with preferably canine OECs and SCs might have considerable advantages concerning transplantation in SCI. The production of artificial constructs using spider silk as 3D matrix for neurons and glial cells holds promising potential regarding neuronal regrowth within the CNS.

10.10 INHIBITION OF GDF8 (MYOSTATIN) ENHANCES BONE HEALING IN MURINE DIABETIC BONE

Christoph WALLNER, Stephanie ABRAHAM, Marcus LEHNHARDT, Bjorn BEHR

Bochum, Germany

INTRODUCTION: The healing capacity of bone can be substantially reduced by metabolic diseases such as diabetes mellitus. Apart from an epidemiological component of metabolic diseases the present poor therapy of diabetic associated bone healing deficiencies demands adequate new treatment options. In previous studies we were able to show a massive impairment of bone regeneration in diabetic bone. In a recent study the protein GDF8 (Myostatin) known for the role in muscle catabolism is significantly involved in bone metabolism. The goal of this study is to investigate the role of GDF8 in diabetic bone healing. As a next step we seek to utilize GDF8 inhibitors (Follistatin) to enhance bone healing in diabetic bones.

MATERIALS AND METHODS: We used an established murine tibial defect model in diabetic (Leprdb/-) and wildtype mice. Uninjured tissue from both genotypes was processed to evaluate the gene expression of GDF8. Subsequently, GDF8-Inhibitor Follistatin was administered in tibial bony defects of diabetic mice. Through histology, immunohistochemistry and QRT-PCR angiogenesis, osteogenesis, differentiation and proliferation were analysed.

RESULTS: We have shown a significantly higher expression of GDF8 in diabetic bone compared to wildtype. Application of GDF8-inhibitor showed a significant improvement in diabetic bone regeneration compared to the control group (diabetic animals without treatment). Immunohistochemistry revealed a significant higher proliferation, angiogenesis and osteogenic differentiation in Follistatin treated diabetic animals as compared to controls.

CONCLUSIONS: GDF8, known for the importance in muscle diseases, seems to play an important role in bone metabolism. In diabetes mellitus bony tissue showed an overexpression of this catabolic protein. Antagonization of GDF8 in diabetic animals leads to a complete restoration of the impaired bone regeneration and represents a promising therapeutic option.