

14.00-15.44 Scientific Session 1 - RESEARCH I

Moderators

Eric ARNAUD - Paris, France

Jan PLOCK - Zurich, Switzerland

**14.00 THE USE OF STUDY REGISTRATION AND PROTOCOLS
IN PLASTIC SURGERY RESEARCH: A SYSTEMATIC
REVIEW**

Thomas PIDGEON, Christopher LIMB, Riaz AGHA, Katherine WHITEHURST,
Charmilie CHANDRAKUMAR, Georgina WELLSTEAD, Alexander FOWLER,
Dennis ORGILL – Chelmsford, UK

Introduction

In 2013, the Declaration of Helsinki mandated that every research study involving human subjects must have its protocol registered in a publicly accessible database prior to the enrolment of the first patient. This systematic review assessed the number of studies published in leading journals of plastic surgery that had either published or registered a protocol with a publicly accessible database.

Materials & Methods

We examined all research articles involving human participants published in Plastic and Reconstructive Surgery, The Journal of Plastic Reconstructive and Aesthetic Surgery and The Annals of Plastic Surgery from 1st April 2014 - 31st March 2015. The primary outcome measure was whether each study had registered or published a protocol with any mainstream registry database. ClinicalTrials.gov, International Standard Randomised Control Trial Number (ISRCTN), WHO (World Health Organisation) International Clinical Trials Registry Platform, The Cochrane Collaboration, the Research Registry, PROSPERO and PubMed were all reviewed.

Results

Of 595 included articles, the most common study designs were case series (n=185, 31.1%). There were 24 randomised controlled trials (RCTs, 4.0%). A total of 24 studies had a protocol registered (4.0%), although no studies had published a protocol in a journal. The most common database to register a protocol was ClinicalTrials.gov (n=17). The study design that most commonly had a registered protocol was the RCT (n=8 of 24, 33.3% of RCTs).

Conclusions

Publication or registration of protocols for recent studies involving human participants in major plastic surgery journals is low. There is considerable scope to improve this and we provide relevant guidance.

14.20 BIOENGINEERED VASCULARIZED EAR

Jerome DUISIT, Giuseppe ORLANDO, Catherine BEHETS, Pierre GIANELLO, Benoît LENGELÉ – Brussels, Belgium

Introduction

After ten years, face allotransplantation is still limited by the costs of lifelong immunosuppression and related long-term complications. Tissue engineering and perfusion-decellularization (PD) have shown promising results for organs, by providing a complex extra-cellular matrix (ECM) with accessible vascular network, suitable for regeneration and transplantation. We hypothesized that PD may be applied to a facial vascularized composite tissue, with ear subunit allotransplant as an emblematic model.

Materials & Methods

Cadaveric porcine (n=9) and human (n=5) ear flaps were procured with their arterial pedicles. PD was undertaken with a detergent-based protocol, monitoring epidermolysis, tissue bleaching, perfusion pressure. Cellular and antigenic removal, ECM major components and growth factors preservation were assessed by histology, DNA quantitation and quantitative colorimetric assays, vascular patency with angioscopy and angio-CT scan. Adipose-derived Stem Cells (ASCs) were seeded on composite scaffolds (n=8) for 14 days and examined with vital staining. Pig to pig scaffold implantations (n=3) were performed to assess biocompatibility.

Results

Ear flap decellularization, interesting vascular tree, skin and fat, was successfully achieved within 7 days. Baseline shape and size were preserved, with limited oedema and vascular resistance at set perfusion flow. Imaging demonstrated a patent vasculature with no contrast fluid extravasation. Histology and DNA quantitation confirmed cell and antigen clearance at all levels with the exception of cartilage, as expected. Preservation of principal ECM components, like elastin, collagen, glycosaminoglycans and associated growth factors critical to angiogenesis (VEGF, TGF- β 1) were observed. ASCs remained viable and proliferated on seeded scaffolds. In vivo implantations resulted in angiogenesis, limited lymphocyte and macrophage infiltration.

Conclusions

PD can be addressed to complex vascularized facial subunit to generate acellular ECM scaffolds with preserved innate vasculature and pedicle, representing a suitable route for cell culture, regeneration and replantation. These findings lay the foundation of bioengineering facial subunits, and first steps towards whole face bioengineering.

14.32 VIABILITY AND PROLIFERATION OF CULTURED ENDOTHELIAL CELLS ON 3D PRINTED POSS-PCU SCAFFOLDS FOR EAR RECONSTRUCTION

Wenceslao CALONGE, Michelle GRIFFIN, Ahmad AL ALI, Peter BUTLER
London, UK

Introduction

All current treatment options for ear cartilage present some drawbacks. Ischaemia and necrosis of the surrounding tissues play a role in failure.

Materials & Methods

POSS-PCU (polyhedral oligomeric silsesquioxane - polycarbonate urea) scaffolds were manufactured following three different techniques in a variety of pore sizes (25 to 300 μm). In addition to casting and coagulating techniques, another set of scaffolds was prepared by additive manufacturing (3-dimensional printing) of a mould of polyvinyl alcohol (PVA) on which POSS-PCU was poured. PVA was removed by water washings. 3-D printing produced different patterns and porosities. Mechanical testing, contact angle, Fourier transform infrared spectroscopy (FTIR) and scanning electron microscopy (SEM) were performed.

Human umbilical vein endothelial cells (HUVEC) were cultured on these scaffolds. Proliferation (Hoechst total DNA assay), viability (Alamar blue assay) and qualitative expression of CD31, actin and VEGF in HUVEC were assessed at different timepoints.

Results

There was no significant mechanical difference between coagulated scaffolds and those obtained by PVA negative moulding. SEM images showed a uniform reticular pattern, a suitable structure for further angiogenesis without bulk residues of PVA.

POSS-PCU 3D-printed scaffolds show hydrophilic interaction that increases proportionally to porosity. FTIR studies showed good correspondence between all types of scaffolds, independently of fabrication. POSS-PCU surfaces did not inhibit HUVECs proliferation. There was sustained proliferation of HUVECs in all porosities along time. Scaffolds with porosities 30% and 40% showed significant higher viability rates on day 4 when compared to the rest, though differences attenuated by day 14. Proliferation assays showed a steady proliferation along time. HUVEC spread actin filaments and expressed CD 31 and VEGF on 3D-printed scaffolds.

Conclusions

Viability and proliferation of HUVEC were not negatively affected. Negative PVA moulds can adopt diverse designs to imitate the network of embedded spaces in the ECM that lodge capillary vessels.

14.44 SIROLIMUS-LOADED IN SITU FORMING IMPLANTS FOR REGIONAL IMMUNOSUPPRESSION IN VASCULARIZED COMPOSITE ALLOTRANSPLANTATION

Damian SUTTER, Jonas SCHNIDER, Esther VÖGELIN, Jan PLOCK, Paola LUCIANI, Jean-Christophe LEROUX – Bern, Switzerland

Introduction

Vascularized Composite Allotransplantation (VCA), such as hand and face transplantation, is an emerging field in reconstructive transplantation. In order to reduce systemic side effects of immunosuppression, the administration of drugs directly into the allograft, leading to high local drug levels has been proposed.

Sirolimus (SIR) may promote regulatory T cell differentiation, which can contribute to peripheral tolerance. The aim of this study was to develop a SIR-loaded in situ forming implant (ISFI) for long-term regional release of SIR directly into the graft and to evaluate the release kinetics and allograft survival.

Materials & Methods

1.) In vitro, SIR-loaded ISFI (PLGA and N-Methyl-2-pyrrolidone) were injected into a release medium and aliquots were analyzed via high-performance liquid chromatography. In vivo, naïve Lewis rats received s.c. injections of ISFI loaded with 5 mg of SIR (n=2). Blood levels were monitored routinely.

3.) Rats underwent hind limb allotransplantation (Brown Norway to Lewis) after an induction therapy and were assigned to three groups: control (n= 9), ISFI injection of SIR 5mg into the transplanted hindlimb (ISFI-ipsi, n=6), or the contralateral hindlimb (ISFI-contra, n= 3). Peripheral blood was analyzed using FACS.

Results

1.) After an initial burst release, a continuous release could be observed for >45 days in naïve animals.

2.) 5mg of SIR suppressed rejection after a single injection on POD 7 for >100 days in 83.33% of ISFI-ipsi. ISFI-contra showed a survival of 68.5, controls of 29 days. ISFI-contra showed a trend towards higher levels of chimerism and T-reg count than ISFI-ipsi.

Conclusions

One time application of ISFI shows feasibility to suppress rejection for >100 days under subtherapeutic systemic levels, while increasing Treg count and chimerism. Regional application of ISFI may reduce overall systemic toxicity and adverse effects in VCA.

14.56 THE EFFECT OF LATE INFECTION AND ANTIBIOTIC TREATMENT ON CAPSULAR CONTRACTURE IN SILICONE BREAST IMPLANTS: A RAT MODEL

Alvaro CABELLO, Katherine MILLER, Diego MARRÉ, José LEIVA, Bernardo HONTANILLA – Pamplona, Spain

Introduction

The effect of late infection on capsular contracture has yet to be established, leaving a gap in clinical guidelines for the treatment patients with breast implants. This trial is the first to assess if the treatment of these infections can reverse this effect in an in vivo rat model and whether late distant infections increase the incidence of capsular contracture.

Materials and Methods

Three groups of female Wistar rats ($n = 42$) received two silicone implants in separate dorsal, subcutaneous pockets. All groups except control underwent injection of a human strain of methicillin-sensitive *Staphylococcus aureus* (MSSA) at least 30 days after implantation, allowing for physiologic capsule formation. The infection group received a peritoneal injection, inducing a transient bacteremia, the treated group received a course of antibiotics following bacterial inoculation, and a final group received no intervention and served as control.

Results

Implants were removed 4 months after insertion, and capsules measured for thickness and sent for bacterial quantification. Compared to both the control and treated groups, capsule thickness in the infection group was statistically greater ($p < 0.05$), a difference not observed between treated and control groups. In addition, a statistically significant positive correlation was found between capsule thickness and bacterial count ($R = 0.614$, $p < 0.01$).

Conclusions

The difference in thickness between the control capsules and those from the infection group is an indication that bacterial contamination of a capsule from a remote late infection may increase the incidence of capsular contracture suggesting that treating late infections could in fact prevent capsular contracture.

15.08 IMPROVING OUTCOMES IN IMMEDIATE AND DELAYED NERVE GRAFTING OF PERIPHERAL NERVE GAPS USING LIGHT-ACTIVATED SEALING OF NEURORRHAPHY SITES WITH HUMAN AMNION WRAPS

Neil FAIRBAIRN, Joanna NG-GLAZIER, Amanda MEPPERLINK, Jonathan WINOGRAD, Robert REDMOND – Boston, USA

Introduction

Photochemical tissue bonding (PTB) uses visible light to create sutureless, watertight bonds between two apposed tissue surfaces stained with photoactive dye. When applied to nerve grafting, PTB can result in superior outcomes compared to suture fixation. Our previous success has focused on immediate repair. It was the aim of this study to assess the efficacy of PTB when performed following a clinically relevant delay.

Materials & Methods

40 male Lewis rats had 15mm left sciatic nerve gaps repaired with reversed isografts immediately (n=20) or after a 30-day delay (n=20). Immediate or delayed repairs were secured using either suture (n=10) or PTB (n=10). Rats were sacrificed after 150-days. Outcomes were assessed using monthly sciatic function index (SFI), muscle mass retention and nerve histomorphometry. Statistical analysis was performed using ANOVA and the post-hoc Bonferroni test.

Results

In both immediate and delayed groups, mean SFI values were greater following PTB although these results were not significant. SFI was significantly greater when performed immediately. Significantly greater muscle mass retention occurred following PTB in both immediate and delayed repairs. Values did not differ significantly between immediate and delayed groups. Histomorphometric recovery was greatest in the immediate PTB group and poorest in the delayed suture group. Fiber diameter, axon diameter and myelin thickness and G-ratio were not significantly different between delayed PTB and immediate suture, the current standard of care.

Conclusions

Light activated sealing of nerve grafts results in significantly better outcomes in comparison to conventional suture when performed immediately and after a delay. Outcomes following immediate suture were comparable to delayed PTB suggesting that light activated sealing may help ameliorate the detrimental impacts of surgical delay.

15.20 THE EFFECT OF VENOUS OUTFLOW AND INFLOW ON DISTALLY BASED VENO-NEURO-FASCIOCUTANEOUS SURAL FLAPS IN RABBITS

Naci KOSTAKOGLU, Aydin TURAN, Umut TUNCEL, Fatma MARKOÇ
Tokat, Turkey

Introduction

The survival rate of distally based flaps with a veno-neuro-adipofascial pedicle was reported to be increased when venous inflow was blocked or distal venous outflow was added. In this study, the effect of both blockage of venous inflow and added venous outflow was investigated, which has not been studied until now.

Materials & Methods

Forty hindlimbs of twenty rabbits were allocated into four groups (n=10 each) of distally based flaps with different management of the lesser saphenous vein as *inflow* (Group I), *no inflow* (Group II), *flow-through* (Group III) and *outflow without inflow* (Group IV) flaps. Flap survival rates and angiography were assessed 10 days postoperatively. Immunohistochemical staining to determine the mean number of microvessel density using the endothelial cell marker CD31 and vascular endothelial growth factor (VEGF) expression levels were performed in the tissue.

Results

The mean flap survival area of Group IV (96.16%) was significantly higher than of Group II (61.07%) and Group I (17.72%). There was no statistically significant difference between Group IV and Group III (84.63). The microvessel density and VEGF staining of Group IV were significantly higher than of group I. Four of the flaps in Group IV showed heavy staining of VEGF, which was not observed in the remaining groups.

Conclusions

Venous blood pressure should be kept low in distally based veno-neuro-fasciocutaneous flaps to create a pressure gradient between arterial and venous blood flow. When the venous blood of the distal limb is not allowed to enter the flap, venous drainage occurs more physiologically, thus flap survival increases. In the clinical setting, it may be difficult to find a recipient vein to increase the outflow in distal leg or foot, however ligation of the vein should still be considered to enhance the survival of these flaps.

15.32 NON-INVASIVE ANGIOGENIC PRECONDITIONING OF SOFT TISSUES FOR RECONSTRUCTIVE PROCEDURES: EVIDENCE-BASED GUIDELINES

Luca LANCEROTTO, Liying CHENG, Anthony HADDAD, Hajime MATSUMINE, Dennis ORGILL, Giorgio GIATSIDIS – Boston, USA

Introduction

Mechanical forces induce angiogenesis in soft tissues and External Volume Expansion (EVE) has been proposed as a non-invasive method to increase vascularization of a recipient site before reconstructive procedures such as free tissue grafting or flap surgery. However, parameters of application (kinetics, pressure, duration) of EVE have not been optimized and their individual effects on soft tissues have not been described. The purpose of this study is to define best parameters of application of EVE and to provide clinical guidelines for efficient preconditioning of soft tissues in reconstructive surgery

Materials & Methods

Dorsal skin of 12-week old C57BL/6J wild-type mice (n =195, 15 per group) was stimulated with EVE varying kinetic (continuous, high-intensity, high-intensity intermittent or moderate-intensity intermittent), pressure (low, mild, strong, very-strong) and duration (very-short, short, long, very-long) of application. On post-stimulation day 5 (PSD5) skin biopsies were obtained from stimulated and contra-lateral control areas and examined for tissue angiogenesis using immunohistochemistry (CD31). Stimulated skin was monitored during treatment to detect signs of complications.

Results

Low-pressure Short Moderate-intensity intermittent EVE best increased the density of cutaneous vascular network compared to controls (+90%, $p<0.05$) limiting the number of complications. Intermittent stimulations provided a higher angiogenic stimuli compared to continuous, static forces (+60%, $p<0.05$). Low and high pressures of EVE did not induce angiogenesis as well as very-short treatments. Long/very-long treatments increased vascularity but also led to skin ulceration and necrosis.

Conclusions

Optimized EVE can efficiently and safely increase vascularity of soft tissues and precondition recipient site in preparation of reconstructive procedures involving free tissue grafts or critically-sized flaps.

16.14-17.52 Scientific Session 2 – RESEARCH II: Adipose Cells

Moderators

Norbert PALLUA – Aachen, Germany

Benoît HENDRICKX – Brussels, Belgium

16.14-16.44 EURAPS Research Council Three Best Papers 2015**16.14 RADIOPROTECTING FREE FLAPS USING LENTI-VIRALLY-DELIVERED SUPEROXIDE DISMUTASE 2 (SOD2) GENE THERAPY**Aadil KHAN, James PAGET, Simon ROBINSON, Paul HARRIS,
Kevin HARRINGTON – London, UK**Introduction**

Adjuvant radiotherapy is harmful to free flaps leading to late adverse effects (LAEs) characterized by fat necrosis, volume loss and contracture often requiring salvage surgery. Using a virally-delivered, free flap gene therapy strategy, this study aims to radioprotect free flaps from LAEs whilst maintaining the oncological efficacy of radiotherapy.

Materials and Methods

Lentiviral particles encoding the superoxide dismutase 2 gene (LVSOD2) were generated and used to infect superficial inferior epigastric artery (SIEA) flaps in Fischer (F344) male rats. LVSOD2 was delivered by intra-arterial injection, into the SIEA, performed ex vivo. LVSOD2-infected and control flaps were irradiated 1-month post-operatively with 50 Gy/3 fractions. Flap outcomes were measured using clinical, imaging, histological and molecular end-points. A tumour recurrence model was developed by engrafting syngeneic tumour cells into control and LVSOD2 flaps prior to irradiation with 20 Gy/5 fractions.

Results

SIEA flap irradiation with 50 Gy/3 fractions resulted in a depletion of SOD2 protein expression and biochemical activity ($p < 0.01$). LVSOD2 infection resulted in durable transgene expression in vivo (6 months). LVSOD2-infected flaps developed significantly less skin paddle contracture ($p < 0.01$), volume loss ($p < 0.001$) and less severe acute/late toxicities as scored using the RadioTherapy Oncology Group (RTOG) scoring system ($p < 0.05$). They also exhibited significantly less fibrosis compared to control flaps ($p < 0.05$) and retained greater reactive oxygen species (ROS) scavenging capacity, and SOD2 protein expression, compared to controls ($p < 0.05$).

Tumour recurrence studies demonstrated greater retardation of tumour growth in LVSOD2 flaps compared to controls ($p < 0.05$) and improved animal survival ($p < 0.01$) following radiotherapy.

Conclusions

We demonstrate that free flap gene therapy with LVSOD2 can protect irradiated flaps from LAEs and appears to, paradoxically, radiosensitize recurrent disease. These findings merit further evaluation of this pre-clinical concept for translation.

16.24 THE ROLE OF TGF- β SIGNALLING IN CUTANEOUS SQUAMOUS CELL CARCINOMA

Aidan ROSE, Patrizia CAMMARERI, David VINCENT, Owen SANSOM, Gareth INMAN – Dundee, UK

Introduction

Solid tumours may evolve over several years via the accumulation of mutations within either stem or differentiated cells. Driver gene mutations within distinct cellular compartments may disrupt tissue homeostasis, driving the accelerated formation of de-novo invasive tumours that theoretically by-pass the typical cancer progression model. The TGF- β signalling pathway mediates growth arrest in normal human keratinocytes. Resistance to this tumour suppressor effect may therefore represent a fundamental hallmark of sporadic human cSCC tumourigenesis.

Methods & Results

Using next generation sequencing techniques on primary human cSCC tumours and a series of in-vitro experiments utilising early passage primary human cSCC cell lines, we sought to identify frequent mutations to key regulators of the TGF- β signalling pathway and interrogate their potential to disrupt TGF- β tumour suppressor responses. A comprehensive tissue micro-array of primary human cSCC tumours was then analysed for endogenous TGF- β activity. This highlighted revealing correlations between active TGF- β signalling and critical clinical-pathological markers of human disease. Next, IHC staining for endogenous TGF- β activity in normal human and murine skin identified highly active TGF- β signalling localised to specific cellular compartments of the hair follicles. Guided by these findings, genetic mouse models then conditionally targeted ablation of TGF- β signalling to these specific compartments, in the presence of common cSCC initiating events, to assess tumour forming potential. These models demonstrated a dose-dependent response to ablation of TGF- β signalling driving the rapid formation of high-grade cSCC.

Conclusions

Identifying the drivers of tumourigenesis and the tumour cell of origin are fundamental goals in human cancer research. The findings discussed shed considerable light on these fundamentals in cSCC – highlighting a significant driver gene potential for key regulators of the TGF- β signalling pathway, a potential cell of origin for cSCC and in combination, their profound potential to initiate rapid cSCC tumourigenesis.

16.34 PERCUTANEOUS DELIVERY OF ADIPOSE DERIVED PERICYTES PREVENTS THE DEVELOPMENT OF ATROPHIC NON-UNION IN A RAT MODEL

Christopher WEST, Tae TAWONSAWATRUK, Iain MURRAY, Bruno PÉAULT, Hamish SIMPSON – Edinburgh, UK

Introduction

Atrophic non-union is attributed to biological failure of the fracture repair process. Pericytes are native ancestors of mesenchymal stem cells (MSC), and a promising source of bone progenitors that may provide trophic factors required for fracture healing. We aimed to evaluate whether pericytes could improve healing in an animal model of atrophic non-union and compare them to bone marrow derived MSC (BM-MSC).

Materials & Methods

Pericytes and MSC were isolated from human adipose tissue and bone marrow, respectively. Seventeen Wistar rats underwent a validated procedure to induce atrophic non-union. Animals were randomly allocated to receive either pericytes (n=5), BM-MSC (n=5) or no cells (n=7). In treatment groups, 5×10^6 cells suspended in PBS were percutaneously injected into the fracture gap 3 weeks after operation. Controls received only PBS injection. Radiographic parameters, histology, micro-CT and biomechanical tests evaluated fracture healing at eight weeks.

Results

At eight weeks, animals in cell treatment groups showed evidence of bone healing with only 1/5 in both the pericyte and BM-MSC groups progressing to non-union, whereas 6/7 in control group had developed non-unions. Radiographic parameters showed significant improvement ($p < 0.05$) over the eight-week period in cell treatment groups. Histology demonstrated bone bridges at the fracture gap in the both cell treatment groups. Bone mineral density of the fracture callus in animals injected with PSC and MSC was significantly higher than controls ($p < 0.05$). The biomechanical properties of the callus of the cell treatment groups were comparable and stiffer and stronger than the control group.

Conclusions

The results from this study demonstrate that pericytes have significant bone regeneration potential in an atrophic non-union model. These cells may have a role in the prevention of atrophic non-union and could enable a paradigm shift in the treatment of fractures at high risk of failing to heal and developing non-union..

16.44 FROM WHITE TO BEIGE: METABOLIC ADAPTATION OF FREE FAT GRAFTS

Pauliina HARTIALA, Erika HOPPELA, Tove GRÖNROOS, Susanna KAUKHANEN, Anne SAARIKKO – Turku, Finland

Introduction

Fat transfer is commonly used when treating soft tissue defects. Adipose tissue can be divided into metabolically inactive white (WAT) and active brown adipose tissue (BAT). Recently discovered beige adipose tissue arises from WAT but has characteristics of brown adipose cells in that they can be metabolically very active. We have previously used an experimental model to investigate the metabolic changes after the free fat transfer. Our results showed that transfer of metabolically inactive WAT into a new environment increases the metabolic activity of the fat grafts to resemble the activity in the recipient site. This led us to speculate, whether the metabolic increase of the transplant is a result of ?browning? of the transplanted WAT into beige adipose tissue.

Materials & Methods

Fat was collected from the mouse epididymal, subcutaneous and visceral regions and placed into the subcutaneous fat of the forehead or in the muscle tissue of the thigh. Metabolic activity of the grafts was investigated by PET-CT. Histological analysis was performed and BAT marker UCP-1 was investigated with RT-PCR.

Results

The glucose metabolism of all transferred fat types was increased when compared to respective untransferred control fat regardless of transfer location (thigh epididymal graft $p=0.04$ and thigh visceral graft $p=0.01$). UCP-1 expression was increased in 4/15 thigh fat samples. Histologically there was variation in the survival, fibrosis, necrosis and inflammatory status of the grafts. However, a few of the well survived thigh grafts clearly showed histological resemblance to brown adipose tissue with small-vacuolated cells.

Conclusions

Transfer of metabolically inactive fat into a new environment modulates the metabolic activity of the fat grafts regardless of transfer area. For the first time, we show that fat transfer can modulate the phenotype of WAT to metabolically active beige adipose tissue.

16.52 UNVEILING THE IN-VIVO IDENTITY OF THE ADIPOSE DERIVED STEM CELL – IMPLICATIONS FOR CLINICAL PRACTICE

Christopher WEST, W. Reef HARDY, Iain MURRAY, Chia SOO,
Bruno PÉAULT – Edinburgh, UK

Introduction

Adipose tissue is an attractive source of mesenchymal stem cells (MSC). It is largely dispensable and readily accessible through minimally invasive procedures. Until recently MSC could only be isolated in a process involving ex-vivo culture, their in-vivo identity, location and frequency remained elusive. We have documented that Pericytes (CD45-, CD146+, and CD34-) and adventitial cells (CD45-, CD146-, CD34+) (collectively termed perivascular stem cells or PSC) represent the native ancestors of the MSC, and can be prospectively purified using fluorescence activated cell sorting (FACS). We analysed the frequency of PSC within adipose tissue, and the effect of patient and procedure based variables on this yield.

Materials & Methods

Within this twin centre study we analysed the adipose tissue of n=131 donors using flow cytometry to determine the frequency of PSC and correlate this with demographic and processing data such as age, sex, BMI and cold storage time of the tissue.

Results

The mean number of stromal vascular fraction (SVF) cells from 100ml of lipoaspirate was 34.4 million. Within the SVF, mean cell viability was 83%, with 31.6% of cells being hematopoietic (CD45+). Adventitial cells and pericytes represented 33.0% and 8% of SVF cells respectively. Therefore, a 200ml lipoaspirate would theoretically yield 18 million prospectively purified PSC - sufficient for many reconstructive and regenerative applications. Minimal changes were observed in respect to age, sex and BMI suggesting universal potential application.

Conclusions

Over 9 million PSC per 100ml of lipoaspirate can be rapidly purified to homogeneity using flow cytometry in clinically relevant numbers potentially circumventing the need for purification and expansion by culture prior to clinical use. The number and viability of PSC are minimally affected by patient age, sex, BMI or the storage time of the tissue, but the quality and consistency of yield can be significantly influenced by procedure based variables.

17.04 EFFECT OF ADIPOSE STROMAL VASCULAR FRACTION ON RANDOM PATTERN FLAP VIABILITY IN RATS WITH DIABETES AND CHRONIC RENAL DISEASE RATS: AN EXPERIMENTAL STUDY

Burak ÖZKAN, Cagri UYSAL, Atilla EYUBOGLU, Aysen TERZI, Eda OZER, Huseyin BORMAN, Nilgun ERTAS – Agri, Turkey

Introduction

High flap failure rates reported in the reconstruction of wounds due to diabetes (DM) and chronic renal disease (CRD). Studies have shown increased flap viability by adipose derived stromal vascular fraction (SVF). However; there is no study in the literature about the effect of adipose stromal vascular fraction on skin flap viability in chronic renal disease and diabetes with chronic renal disease.

Materials & Methods

48 male Sprague Dawley rats were used. Diabetes was induced by 65mg/kg intraperitoneal strepto-zocin administration. Chronic renal disease was induced by 5/6 nephrectomy. Four groups consisting of 12 rats were formed. 2 rats were used for obtaining adipose tissue from the inguinal regions for stromal vascular fraction preparation in each group. Group I (Control group): Two dorsal flaps were elevated, phosphate buffered saline (PBS) were injected to the flaps. Group II (DM), Group III(CRD), Group IV(DM+CRD): After disease induction and period; two dorsal flaps were elevated, SVF were injected to the left flap, PBS were injected to the right flap. Flaps were harvested for macroscopic and histopathological assessments at postoperative 7th day.

Results

SVF was improved flap viability significantly ($p<0,05$). New capillary formation found significantly more in SVF groups in capillary density assessment ($p<0,05$). This result was compatible with the scarcity of the vasculature in microangiography. When blood VEGF levels were compared, increase in day 1 and day 7 were significant according to control group ($p<0,05$). When groups were compared each other there were not significant difference except Group II(diabetes)

Conclusions

The study has shown that DM and CRD impaired flap viability. Diabetes with chronic renal disease deteriorated the flap viability much more. This results were indicated that in vivo function of stem cells were possibly impaired by uremia dominantly and diabetes due to microenvironmental changes.

17.16 THE EFFECTS OF HEPARIN AND METAMIZOLE SODIUM ON THE FAT GRAFT VIABILITY

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Savas SEREL – Ankara, Turkey

Introduction

Although usage of autologous fat grafting has been gained popularity in plastic surgery, wide difference in survival of fat grafts still remains as an unsolved problem.

In this study, the effects of heparin and metamizole sodium on the survival rate of autologous fat grafts were investigated. Getting benefit of the ability of heparin to induce angiogenesis and of the spasmolytic effect of metamizole sodium, the ability of these two substances to increase the survival rate of fat grafts was presumed and investigated.

Materials & Methods

24 Wistar albino female rats were randomly assigned into 3 groups as control group (the fat grafts were immersed in normal saline), heparin group and metamizole sodium group. The inguinal area was used as fat graft donor area. The weight and size of each fat graft were measured, then the fat graft was immersed according to its group into the previously prepared solution for 20 minutes. The scalp was used as the recipient area. The fat grafts were excised and the animals were euthanized after 8 weeks. Each excised fat tissue's weight and size were measured again, afterwards histopathological assessments were done.

Results

The effect of heparin and metamizole sodium on the fat graft viability was evaluated histopathologically; investigating the living adipocyte rate, necrosis, cyst formation, fibrosis, inflammation and neoangiogenesis. The increase in fat graft viability was found to be statistically significant in the heparin group compared to the control group, while the results of metamizole sodium group were statistically insignificant compared to the control group.

Conclusions

This study demonstrates that addition of heparin to fat grafts for 20 minutes before fat graft injection increases the fat graft survival rate, while metamizole sodium does not show such benefit.

**17.28 IMPACT OF HYPERGLYCEMIA AND OXYGEN
TENSION ON ADIPOSE STEM CELLS: IMPORTANCE
FOR ALLOGENIC AND AUTOLOGOUS SOURCES IN
DIABETIC WOUND HEALING**

Aurore LAFOSSE, Cécile DUFEYS, Christophe BEAULOYE, Sandrine HORMAN, Denis DUFRANE – Brussels, Belgium

Introduction

Type 2 diabetes mellitus (T2DM) can impact the source (by chronic inflammation of adipose tissue, cell senescence, and oxidative stress) and wound healing properties (reduction of cell survival and growth factor release) of adipose mesenchymal stem cells (ASC). This work investigated the in vitro impact of T2DM on autologous (diabetic patients) and allogeneic (normoglycemic patients) sources of ASC.

Materials & Methods

The impact of different sequences of hypoxia and hyperglycemia on survival, proliferation, and growth factor release (VEGF, KGF, SDF-1 α) was studied in vitro in ASC (from nondiabetic [n=8] or T2DM patients [n=4]) and was compared to dermal fibroblasts (DF; n=8) and keratinocytes (Kc; primary lineage).

Results

No significant difference was found in ASC from nondiabetic and diabetic humans regarding isolation and proliferation up to passage 4. A significant reduction of KGF release was found for diabetic ASC, and a similar VEGF release was found in nondiabetic and diabetic ASC. No impact of hypoxia or hyperglycemia on cell viability and proliferation was found on ASC, DF, or Kc. When hypoxia was combined with hyperglycemia, ASC demonstrated a significant increase in VEGF secretion (+64%, p<0.05) with no impact on KGF release in comparison to physiological conditions (5% oxygen and 1 mg/L glucose). SDF-1 α (-93%, p<0.001) and KGF (-20%, p<0.05) secretion by DF significantly decreased in these conditions.

Conclusions

Autologous and allogeneic ASC demonstrated a significant advantage to cure diabetic wounds in comparison to DF and Kc. However, allogeneic ASC could be a better solution because of its higher release of KGF in diabetic environment.

**17.36 PREVENTION OF PERINEURAL ADHERENCE
WITH LIPOGRAFTING: EXPERIMENTAL STUDY
IN ATHYMIC MOUSE**

Mario CHERUBINO, Igor PELLEGGATTA, Alessandro CROSIO, Pierluigi TOS,
Luigi VALDATTA – Varese, Italy

Introduction

Perineural adhesions may represent an important problem after surgery involving peripheral neural system. The recurrent carpal tunnel syndrome as a result of entrapment neuropathy due to adhesions of the nervous tissue represents this situation. Lipoaspirate with adipose derived stem cells (ASCs) with their pro-regenerative characteristics can be useful to prevent the neural damage or to facilitate the neural regeneration. Our idea was to use the lipoaspirate as antiadherent. The authors present an experimental study.

Materials & Methods

Thirty three athymic mice were operated. We exposed both sciatic nerves. Adherence between the nerves and the surrounding tissue were created with cauterization of nerve bed. We randomly divided all sciatic nerves into four groups: cauterization of nerve bed A, cauterization of nerve bed + anti-adherence gel carboxymethylcellulose/polyethylene oxide (CMC-PEO) B, cauterization of nerve bed + lipoaspirate C, and control group D. A bio-mechanical evaluation was performed to measure the peak force required to pull out the nerve from its muscular bed. For histological analysis, nerve and scar tissue inside the muscles were harvested en bloc. After paraffin inclusion, transversal sections were obtained and stained with Sirius Red.

Results

In group C we registered a peak pull out force slightly superior to B (38,3 vs 37,8 ? t Student test 0,913). In group A, the force necessary to tear the nerve apart was markedly superior (46) to both B and C groups. In control group, we reported the minimal strength (31) to slide the nerve from the tissue.

Conclusions

As it is one of the most common procedures in aesthetic surgery, liposuction may also be used as an alternative flap delay method as a less invasive and outpatient procedure in flap surgery to enhances the blood flow of axial pattern skin flaps.

17.44 COMPARISON OF THE EFFECTS OF INHALATION AND SPINAL ANESTHESIA TO MICROCIRCULATION IN THE EXPERIMENTAL RAT MUSCLE-SKIN FLAP MODEL

Fatih CERAN, Mehmet AKKOC, Emin KAPI, Mehmet BOZKURT
Istanbul, Turkey

Introduction

The effects of spinal anesthesia(SA) on microcirculation, applied in different musculocutaneous flaps which was asserted to effect flap microcirculation positively on postoperative period will be examined.

Materials & Methods

35 rats were separated into five groups. First group was control group without ischemia. TRAM flap was elevated under inhalation anesthesia(IA) in 2. group, and under SA in 3., gluteus maximus muscle(GMM) flap was elevated under IA in 4., and under SA in 5. Oxygen saturation was measured on 0th, 7th, 14th, and 28th days. Intracardiac blood samples were obtained at the end of the experiment. Malondialdehyde(MDA), Total Antioxidant Status(TAS), and Total oxidative stress(TOS) values were determined. Histo-pathologic examination(HE) was performed.

Results

The MDA values were found to be elevated significantly in 2., 3. and 4. groups. TAS values were significantly higher in 2. and 5. groups. Despite the use of same anesthetic technique in both flap elevation procedures outcomes were different; in 2. group compared to 4. TAS values were significantly higher in GMM elevated group among the SA applied groups. TAS values were significantly higher in 5. compared to 4 group. TOS values were significantly higher in 2. compared to 4. group. HE showed significant difference between 1. group and both 2.and 3.group and an increase in hyalinization.

Conclusions

In line with the results, it was concluded that anesthetic method affects the microcirculation of the flap; however localization of the flap is also important.

FRIDAY 27 MAY 2016**08.00-10.00 Scientific Session 3 – MICROSURGERY I: Head & Neck**

Moderators

Peter CORDEIRO – New York, USA

Sukru YAZAR – Istanbul, Turkey

08.00 IDENTIFICATION OF INDEPENDENT RISK FACTORS FOR FLAP FAILURE: A RETROSPECTIVE ANALYSIS OF 1,530 FREE FLAPS FOR BREAST, HEAD&NECK, AND EXTREMITY RECONSTRUCTION

Marc MUREAU, Tim DE JONG, David LAS, Michiel ZUIDAM, Steven HOVIUS – Rotterdam, The Netherlands

Introduction

Reconstructive microsurgery is a powerful tool to treat various complex defects. However, flap loss remains a possibility, leading to additional surgery, hospitalisation, and costs. Consequently, it is important to know which factors lead to an increased risk of flap failure, so that measures can be undertaken to reduce this risk. Therefore, we analysed our results over a 20-year period to identify risk factors for flap failure after breast, head and neck, and extremity reconstruction.

Materials & Methods

Medical files of all patients treated between 1992 and 2012 were reviewed. Patient characteristics, surgical data, and postoperative complications were scored and independent risk factors for flap loss were identified with multivariate analyses using a backward model. P-values <0.05 were considered statistically significant.

Results

A total of 1,530 free flaps were performed in 1,247 patients. Partial and total flap loss occurred in 5.5% and 4.4% of all free flaps. Signs of compromised flap circulation were a risk factor for flap failure in all flaps (OR=3.60 to 11.23), although 62% of these flaps could be salvaged after early re-exploration. More specifically, risk factors for flap failure in breast reconstruction were previous radiotherapy (OR=2.88,p=0.006), venous anastomosis revision (OR=5.75,p=0.001), GAP flap choice (OR=9.08,p=0.030), and postoperative bleeding (OR=12.80,p<0.001). In head and neck reconstruction, pulmonary comorbidity (OR=4.74,p=0.007), anastomosis to lingual vein (OR=7.17,p=0.036) or superficial temporal artery (OR=4.4,p=0.001) were risk factors, while a radial forearm flap

reduced the risk (OR=0.24,p=0.029). In extremity reconstruction, diabetes (OR=9.16,p=0.019) , prolonged anaesthesia time (OR=6.49,p=0.005), and postoperative wound infection (OR=6.32,p=0.005) were risk factors.

Conclusions

Independent pre-, intra-, and postoperative risk factors for flap failure after microvascular breast, head and neck, and extremity reconstruction were identified. These results may be used to improve patient counselling and to adjust treatment algorithms to further reduce the chance of flap failure.

8.08 OUTCOMES OF MICROSURGICAL HEAD & NECK CANCER RECONSTRUCTIONS: EVALUATING SAFETY AND EFFICACY IN THE VERY ELDERLY POPULATION

Eleonora DIMOVSKA, Jonothan CLIBBON, Martin HEATON, Marc MONCRIEFF, Andrea FIGUS – Norwich, UK

Introduction

The rising incidence in primary Head & Neck (H&N) cancers in the elderly presents a dilemma regarding the appropriateness of complex surgery in this assumed frail age group. With limited data on surgical morbidity, survival and patient quality of life (QoL), this analysis aimed to broaden the understanding of safety and effectiveness of microsurgical treatment in very elderly H&N cancer patients.

Materials & Methods

A prospective data base analysis was used to evaluate surgical outcomes (morbidity, survival and QoL) in all patients aged 80 and above undergoing microsurgical reconstruction for cutaneous and intra-oral H&N cancers between 2004 and 2014. Outcomes were assessed for their association with surgical, tumour and patient variables. Co-morbidities were categorized by the ACE27 index and post-operative morbidity by the Clavien-Dindo scoring system. QoL was analyzed using the UW-QOLv4.

Results

Out of 720 microsurgical reconstructions, 96 patients were identified. Median survival was 25 months. The ACE27 index was the only variable significantly associated with survival with a 5-year survival of 59.2% in the least comorbid group vs 19.7% in the most comorbid group (p 0.015). ACE-27 showed influence on socio-emotional QoL scores. Physical QoL scores were influenced by tumour stage and operative factors. Patients were found to value physical QoL over socio-emotional in obtaining overall QoL.

Conclusions

Microsurgical reconstructions are safe and overall well tolerated in the very elderly patients and should be considered predominantly based on comorbidity. Tumour stage, flap type and cancer site should still form part of the decision making and pre-operative counseling due to their significant impact on post-operative QoL.

8.28 EFFECT OF NEW RADIATION STRATEGIES ON FUNCTIONAL OUTCOMES OF IMMEDIATE FACIAL NERVE REPAIR AFTER RADICAL PAROTIDECTOMY

Jesus OLIVAS, Shan-Shan QIU, Diego MARRÉ, Bernardo HONTANILLA Pamplona, Spain

Introduction

During the last decades there has been much controversy on whether to perform nerve repair before or after irradiation with few and contradictory studies about this topic. The aim of this study was to compare the functional long-term results of immediate facial nerve repair in patients with parotid neoplasms treated with surgery alone versus surgery plus brachytherapy and radiotherapy. This is the first study addressing the effect of new radiation strategies on facial nerve regeneration, despite the relatively small sample because of the difficulty in recruiting patients with this specific type of lesion. Moreover, we also attempt to address the possible effect caused by the mechanical presence of a brachytherapy catheter close to a nerve coaptation.

Materials & Methods

Eighty-four patients underwent total parotidectomy at our institution between 2007 to 2014, of which 29 were radical with immediate facial nerve repair with sural nerve grafts. 13 patients (group 1) did not receive adjuvant treatment whereas 16 patients (group 2) received postoperative brachytherapy plus radiotherapy. Functional outcomes were compared using Facial Clima, a quantitative automatic system which obtains objective numeric measurements of distances and velocities between 2 points and also assesses symmetry of motion.

Results

Mean percentage of blink recovery was 94.2 ± 3.5 for group 1 and 91.3 ± 4.7 for group 2 ($p = .41$). Mean percentage of commissural excursion restoration was 79.7 ± 4.1 for group 1 and 73.7 ± 6.1 for group 2 ($p = .35$). Mean time from surgery to first movement was 6.1 ± 0.8 months for group 1 and 6.6 ± 0.9 months for group 2 ($p = .23$).

Conclusions

Brachytherapy plus radiotherapy does not affect the functional outcomes of immediate facial nerve repair with nerve grafts.

8.40 FREE ANTEROLATERAL THIGH FLAP AND MASSETER NERVE TRANSFER IN RECONSTRUCTION OF EXTENSIVE PERIAURICULAR DEFECTS

Lara CRISTOBAL, Sora LINDER, Beatriz LOPEZ, Maria MANI, Andrés RODRIGUEZ-LORENZO – Uppsala, Sweden

Introduction

Tumor ablation in the periauricular area often results in facial nerve sacrifice along with extensive defects including skin, parotid gland, lymphatic nodes, temporomandibular joint (TMJ), sternocleidomastoid muscle, temporal bone or/and dura mater. The goals of reconstruction include stable wound closure, facial reanimation, and volume restoration in the depleted neck. We present our experience using free anterolateral thigh flap (ALT) combined with masseter to facial nerve transfer for management of extensive and complex defects in periauricular area after resection of malignant tumors.

Materials & Methods

Between 2011 and 2015, six patients underwent reconstruction with free ALT flap and masseter nerve transfer for extensive periauricular defects after tumor excision. All patients received postoperative radiation. The ALT perforator flap was customized according to the defect as a quimeric, adipofascial or fasciocutaneous flap to restore soft tissue and volume defects. Facial nerve reconstruction was performed using the masseter nerve transfer to the buccal branch of the facial nerve for smile restoration. In those cases where the facial nerve stump was available, interposition of a nerve graft to the zygomatic and frontal branches was performed to provide separate blinking. The outcomes were analyzed in terms of wound closure, visible contour deformity, symmetry and facial nerve function using the Terzis Facial Grading System for smile restoration.

Results

All ALT flaps survived and provided stable wound closure and adequate volume restoration in the neck. Resting facial tone and symmetry were achieved in all cases and smile restoration was graded as good or excellent in 4 out of 6 cases. The resection of the TMJ resulted in mandible deviation and difficulties for initial training of the masseter nerve transfer in 3 of 6 patients.

Conclusions

Reconstruction of extensive periauricular defects following oncologic resection can be optimally performed using free ALT flap and masseter nerve transfer to the facial nerve.

9.00 MANDIBULAR CONDYLE RECONSTRUCTION WITH FIBULA FREE-TISSUE TRANSFER. THE ROLE OF THE MASSETER MUSCLE

Andreas GRAVVANIS, Dimitrios ANTERRIOTIS, Nick KATSIKERIS, Dimosthenis TSOUTSOS – Athens, Greece

Introduction

Segmental resection of the mandible with disarticulation of the temporomandibular joint is occasionally required in the management of extensive tumors. The fibula flap has become a treatment option for primary restoration of mandibular condyle, but little is published about the refinements of the technique and its effectiveness in the function of the joint. Given that the masseter is the key muscle that pulls the mandible upward, we hypothesized that a good functional recovery may be achieved by inseting the muscle at the reconstructed mandible.

Materials & Methods

We prospectively studied all patients undergoing reconstruction of the mandible with condylar removal (January 2009-January 2015).

All of them underwent condylar reconstruction by means of a fibular flap. The distal portion of the fibula was shaped to form the neo-condyle and placed directly into the glenoid fossa. The temporomandibular disc was preserved over the pole of the fibula. The deep portion of the masseter was inset and secured at the angle of the reconstructed mandible.

Maximum interincisal opening, occlusion, and diet determined outcomes after full recovery. Panoramic radiographs were performed postoperatively to evaluate condylar position.

Results

Five out of 39 mandibular reconstructions involved condyle-ramus-body, in the study period. Three patients had immediate and 2 delayed reconstruction. The mean follow-up was 26 months.

Postoperatively, 4 patients had no difficulty with occlusion, which was rated as „good“ or „excellent“; the other patient had an open-bite deformity, but he was able to masticate solid food and maintain an oral diet. Although no significant condyle dislocation was recorded, two had slight ipsilateral deviation on mouth opening. Nevertheless, cosmesis was generally satisfactory and all patients maintained intelligible speech.

Conclusions

The free fibula transfer with direct seating of the fibula into the condylar fossa followed by masseter muscle re-insertion provides acceptable functional reconstruction of the mandibulectomy-condylectomy defect.

9.08 RAPID PROTOTYPING TECHNIQUES FOR OSSEUS RECONSTRUCTION WITH OSTEOCUTANEOUS FIBULAS: HOSPITAL-BASED ON SITE 3D PRINTING VERSUS BIOTECH OFFSITE MANUFACTURING

Jan Jeroen VRANCKX, Stan POLITIS, Lloyd NANHEKHAN, Jozef SCHOENAERS – Leuven, Belgium

Introduction

Traditionally, for bony reconstructions the linear fibula is remodelled by cutting it into vascularised segments which are fixed by osteosynthesis. Obtaining the ideal cutting angles is time-consuming precision work but elementary in terms of aesthetic and functional outcome. 3D-technology enhances accuracy by providing custom-made scaffolds according to the CT images. However, this outsourced technology is too expensive versus the generated income via social security. Therefore we used our own *in situ* 3D printer to generate cutting jigs and fixtures by additive manufacturing technology prior to 10 osseous reconstructions of mandible and maxilla with free osteocutaneous fibulas.

Materials & Methods

A ‘computer assisted planning program’ calculated the ideal fibula cutting length and the required number of segments. The cutting jig was generated using an additive manufacturing system by 3D printing and according to the resection boundaries and to the position of skin perforators. We used a Stratasys Objet Connextm 3D printer. The registered fixture was used to arrange the fibula pieces into the shape of the defect while preserving an overview on the vascular pedicle.

Results

The cutting fixture significantly shortened the time to efficiently complete lesion resection and fibula segmentation. The registered fixture strongly promoted the accuracy and speed of arrangement of the fibula segments in the required shape and angles. When the full fibula length was required, the variation in exact location and a paucity of perforators proved to complicate the fitting according to the calculated models despite CT angio.

Conclusions

The on-site 3D printer efficiently generated the required materials similar to outsourced Additive Manufacturing. This 'home-made' technology overcomes the disadvantages of fit and match traditional surgery. The *in situ* 3D printer requires a high initial investment, high maintenance and full specialised staff. Precision planning with CT angio and 3D is mandatory when the full fibula length is required along with a perforator based skin island.

9.20

THE FREE TEMPORAL ARTERY POSTERIOR AURICULAR SKIN (TAPAS) FLAP

Patrik LASSUS, Andrew LINDFORD – Helsinki, Finland

Introduction

We present our experience using the free Temporal Artery based Posterior Auricular Skin (TAPAS) flap. This is a novel fasciocutaneous flap raised from the posterior auricular and mastoid region.

Materials & Methods

Four patients underwent orofacial reconstruction using the TAPAS flap. Two cases involved full-thickness reconstruction of the lower eyelid post-trauma and late reconstruction of the lower lip post tumor resection. Two further cases consisted of immediate floor of mouth (FOM) reconstruction post tumor resection and immediate tongue reconstruction following hemiglossectomy. The operative technique is described in more detail in the presentation.

Results

There were no flap losses. In one flap however, the distal 10mm tip did not survive and required bedside revision. There was no other postoperative morbidity. Indocyanine staining was performed in one case and revealed the flap circulation to be adequate down to the level of the ear lobule. The flap dimensions varied between 25x60mm width and 40x70mm length. Pedicle length was constant at 55-60mm. The donor sites were closed directly in 2 cases and necessitated skin grafts in the other 2 cases.

Conclusions

We herein present a novel microvascular flap with exceptional qualities. To our knowledge it is the thinnest (3mm) axial flap thus far described. The flap is extremely elastic and pliable and shares a similar colour to facial skin. Maximal pedicle length is only 60mm but pedicle vessel calibre is good. Donor site morbidity is minimal and the only major limitation is the small flap size. The TAPAS flap is therefore a useful addition to the armamentarium of free flaps in oral and facial reconstruction.

9.32 CALF PERFORATOR FLAPS: AN IDEAL SOLUTION FOR ORAL CAVITY RECONSTRUCTION

Alexandra MOLINA, George ORFANIOTIS, Luke CASCARINI,
William TOWNLEY – London, UK

Introduction

Calf perforator flaps, most commonly medial sural artery perforator (MSAP) flaps, are emerging as a popular choice in head and neck reconstruction due to their favourable donor site morbidity. In this three part study, we demonstrate that calf perforator flaps have ideal properties for oral cavity reconstruction.

Materials & Methods

Firstly, a cadaveric study was performed to demonstrate perforator location and document variations in source vessels. 20 medial calves were dissected and the position of perforators was recorded in relation to fixed landmarks. Secondly, the quality of the medial calf as a donor site was assessed by comparing its tissue thickness with the anterolateral thigh in 50 lower limb CT scans. Finally, a prospective clinical study was performed, collecting data on sequential calf perforator flaps used in oral cavity reconstruction over an 18 month period.

Results

In the cadaveric study, musculocutaneous MSAP perforators were found in 19 of the 20 cases (mean 2.3/limb). Perforator location ranged from 20-170mm inferior to the fibular head and 0- 45mm medial to the septum. Septocutaneous perforators from the sural artery were present in 2 limbs. The mean thickness of the calf tissue envelope was found to be 49.5% of the thickness of the anterolateral thigh ($p<0.05$) on review of 50 lower limb CTs. A total of 17 free calf perforator flaps (14 MSAP, 2 sural artery perforator, 1 soleal artery perforator) were performed over the study period. Defects comprised 8 floor of mouth, 8 tongue, 1 buccal mucosa. Mean pedicle length was 10.2cm and mean flap size was 9x5cm. Fifteen of 17 donor sites were closed directly. All flaps survived. Early complications included one return to theatre (haematoma) and three wound infections which resolved with antibiotics.

Conclusions

Our study suggests that the vascular anatomy of the medial calf is predictable, and generates reliable perforator flaps that are ideal for oral cavity reconstruction.

9.44 COMPLEX TRACHEAL RECONSTRUCTION WITH DOUBLE SKIN PADDLE RADIAL FOREARM FREE FLAP REINFORCED BY RIB CARTILAGES

Céline THOMET, Ali MODARRESSI, Eva RÜEGG, Pavel DULGUEROV, Brigitte PITTET-CUÉNOD – Geneva, Switzerland

Introduction

Long-segment tracheal reconstruction remains a challenge. The ideal tracheal substitute should present a circumferential rigid framework to avoid the collapse of the neotrachea and maintain airflow patency, be longitudinally flexible to allow neck mobility and be covered by epithelium to prevent stenosis. In the past, tracheal reconstruction has been performed by prosthetic materials, allotransplantation of trachea or aorta, engineered tissue, or autologous small bowel, esophagus and skin flaps. These procedures had a high complication rate like infection, prosthetic dislocation, immunologic rejection, stenosis or necrosis. Kolb and Darteville described an autologous technique using a radial forearm free flap reinforced by rib cartilage. We describe here two cases of complex tracheal reconstruction with a modification of this technique by including two skin paddles allowing the reconstruction of the trachea and a second adjacent defect.

Materials & Methods

Two patients with recurrent advanced tracheal cancer underwent single-staged tracheal reconstruction after total laryngectomy and tracheal resection. Both patients presented a second adjacent defect due to cancer extension, one into cervical skin and one to esophagus anterior wall. Reconstruction was performed using a fasciocutaneous forearm free flap separated into two paddles, one for the adjacent defect and one for the trachea. The latter was reinforced by thin rib cartilage sticks inserted under the dermis and sutured to form a tube.

Results

Postoperative courses were uneventful, without any infection, fistula or wound breakdown. After 27 and 26 months of follow up respectively, the airway patency was physiological without stenting and there was no stenosis.

Conclusions

The use of forearm free flap reinforced by rib cartilages strips offers a valuable option for tracheal reconstruction. The modification of two independent skin paddles harvested on the same vascular pedicle offers further advantages for complex tracheal reconstructions and adjacent defects in these particularly complex cases with advanced disease.

9.52

GRAFTING OF THE COMMON CAROTID ARTERY AFTER EXCISION DUE TO NECK MALIGNANCIES WITH CAROTID INVOLVEMENT: A REPORT OF 2 CASES

Spiros STAVRIANOS, Parthena DESKOULIDI, Maria KOTROTSIOU, Dimitrios KARIPIDIS, Othon PAPADOPOULOS – Athens, Greece

Introduction

Carotid artery resection yields a chance of cure in patients with advanced head and neck carcinoma involving the carotid artery. Interposition grafting may minimize the risk of neurologic morbidity, although it is technically difficult when there is involvement of the internal carotid artery close to the skull base.

Materials & Methods

The patients were admitted due to neck mass of unknown origin and underwent CT, MRI and triple endoscopy. The 1st patient, 42 years old, underwent multiple biopsies of the nasal pharynx, the base of the tongue and the tonsils, which were identified as the tumor origin. Wide excision of the mass, radical neck dissection, resection of the carotid artery, the accessory nerve, the vagus nerve, (via mandibulotomy) the tonsil, the palate and base of the tongue was performed. The reconstruction included a great saphenous vein graft using a Javid shunt, replacement of the vagus nerve with a sural nerve branch and ALT flap combined with vastus lateralis. The 2nd patient, 31 years old, underwent an extended radical neck dissection including the cervical plexus, the internal jugular vein, the sternocleidomastoid, the accessory nerve, the hypoglossal nerve, the vagus nerve and the external carotid artery. The reconstruction included grafting of the common carotid artery to the internal carotid artery just before it entered the skullbase, using a great saphenous vein in an end to side fashion.

Results

By clinical examination, follow-up and duplex scanning, the patency of the carotid grafts, vascular and non-vascular complications, disease recurrence and survival were analyzed.

Conclusions

Internal carotid artery invasion by malignancy portends a poor prognosis. Our results show that carotid artery resection yields an opportunity for cure or can provide reasonable palliation.

10.30-12.16 SCIENTIFIC SESSION 4 – BREAST

Moderators

Åsa EDSANDER-NORD – Stockholm, Sweden

Susanna KAUKANEN – Helsinki, Finland

10.30 Introduction of the 2015 AAPS Leonard R. Rubin Award Winner

Michael BENTZ - AAPS President 2015

**10.32 AAPS BEST PAPER
BREAST IMPLANT ASSOCIATED ANAPLASTIC
LARGE CELL LYMPHOMA: STAGING, DISEASE
PROGRESSION AND MANAGEMENT STRATEGIES**

Mark CLEMENS, Charles BUTLER, Kelly HUNT, Michelle FANALE,
Steven HORWITZ, Hui LIU, Jun LIU, Ken YOUNG, Jeffrey MEDEIROS,
Roberto MIRANDA – Houston, USA

Introduction

Breast implant-associated anaplastic large cell lymphoma (BI-ALCL) is a newly identified lymphoma. Patterns of disease progression and optimal treatment strategies have not been described.

Materials & Methods

The literature was reviewed for all published cases of BI-ALCL from 1997 to September 2014, contacted corresponding authors to update clinical follow up, and combined data with institutional cases. A novel clinic-pathologic TNM staging system is proposed and was compared to traditional Ann Arbor staging to determine prognostic value for overall survival (OS) and progression free survival (PFS).

Results

We identified 116 unique cases of BI-ALCL, including 91 previously reported and 25 unreported cases. Pathologic slides were available in 40 patients for pathologic staging. Average follow up was 41 months [range: 0-192 months]. The median OS was 13 years, OS rate 93% at 3-years and 89% at 5-years. 18 progression events were noted and median PFS was 13 months, with 3-year and 5-year PFS at 79.4%. Total capsulectomy with implant removal (TCIR) prolonged OS ($p=0.022$) and improved PFS ($p=0.014$), and the effect of definitive surgery was statistically significant for PFS benefit (HR=0.14, 95% CI=0.05-0.46, $p=0.001$). The PFS was significantly different by Ann Arbor staging ($p=0.013$) and by the newly proposed clinical staging ($p=0.030$).

Conclusions

Advanced stage, presence of mass, incomplete resection, and delay in definitive surgical treatment were associated with poorer prognosis. Surgical management with definitive excision and oncologic surveillance is adequate for most patients with BI-ALCL. The role for chemotherapy, targeted immunotherapy, and/or radiation for advanced disease requires further research in larger series.

10.40 THE EFFECTS OF REDUCTION MAMMAPLASTY ON SERUM LEPTIN LEVELS AND INSULIN RESISTANCE

Hakan UZUN, Ozan BITIK, Yahya BALTU, Çigdem SÖNMEZ, Aysegül KAYMAK – Ankara, Turkey

Introduction

The reduction mammoplasty has been a well executed and known procedure in which considerable amount of fatty tissue is removed from the body. The authors aimed to show the effects of the reduction mammoplasty on serum leptin levels and insulin resistance.

Materials & Methods

42 obese female patients who had gigantomastia were operated. We recorded patients' demographic and preoperative data, including age, weight, height, body mass index. Fasting serum leptin, glucose and insulin levels were noted. Homeostasis model assessment scores were calculated. At the postoperative 8th week, patients were reevaluated in terms of above parameters assessing the presence of any difference.

Results

Serum leptin levels were decreased postoperatively and the decrease was statistically significant. We were able to show a decrease in homeostasis model assessment score, which indicated an increase in insulin sensitivity, and this change was statistically significant. There was found a significant correlation between body mass index and leptin change postoperatively.

Conclusions

Reduction mammoplasty is not solely an aesthetic procedure, but it decreases serum leptin levels and increases insulin sensitivity, which may help obese women to reduce their cardiovascular risk.

10.48 TO INCREASE NAC VIABILITY WITH COMBINATION OF WURINGER'S HORIZONTAL SEPTUM AND INFERIOR PEDICLE IN PATIENTS WITH BREAST HYPERTROPHY

Osman KELAHMETOGLU, Remzi FIRINCIOGULLARI, Caglayan YAMGUR, Kemalettin YILDIZ, Ethe, GUNEREN – Istanbul, Turkey

Introduction

Breast reduction techniques depend on vascularity of pedicle. The keeping vascularity of nipple-areola complex (NAC) is mandatory for reduction mammoplasties because NAC is the most important part of breast as aesthetic and functional. The inferior pedicle technique is the most used method for breast reduction around the world. For gigantomastia and hypertrophic breasts can have longer pedicles at inferior pedicled reduction techniques and longer pedicles may cause problems about NAC viability. In this study we have tried to present that the preventing NAC viability by combination of Wuringer's septum and inferior pedicle.

Materials & Methods

This study includes 60 women (mean age 38.2 ± 11.3 years) who underwent breast reduction procedure with combination of Wuringer's septum and inferior pedicled, between april 2012 and october 2015. Utilizing a prefabricated Wise-pattern template, all patients were marked preoperatively in a standing upright position. The base of the pedicle was marked at the level of the inframammary ridge with a width of 8 cm. This led us to resect as much tissue as possible and Wuringer's septum was always protected and included in the pedicle.

Results

The patients were followed up 5.6 ± 3.7 months. Resection weights of right and left sides were 1335 ± 598 gr and 1279 ± 587 gr. Venous insufficiency was seen in 5 cases (%8.3) and in 1 case it caused partial NAC necrosis (%1.6). No total NAC necrosis was seen. 15 breasts (%12.5) were described as gigantomastia (resection weights > 2000 gr).

Conclusions

Inferior pedicled breast reduction technique has shorter learning curve than other techniques and for gigantomastia and extreme hypertrophic breasts to use the combination of Wuringer's septum can be utility. This method may help junior plastic surgeons to have safer and more satisfied results at their beginning of the surgical lives.

11.00 MODIFIED RIBEIRO TECHNIQUE USING THE LICAP FLAP FOR AUTOAUGMENTATION MASTOPEXY IN MASSIVE WEIGHT LOSS PATIENTS - REVIEW OF 49 PATIENTS

Andreas WOLTER, Till SCHOLZ, Jens DIEDRICHSON,
Andreas ARENS-LANDWEHR, Jutta LIEBAU – Düsseldorf, Germany

Introduction

Mastopexy in massive weight loss patients is challenging. The breast mound is often unstable and deflated with a loose inelastic skin envelope and medio-caudally displaced areolas. It has become apparent that mammoplasty techniques in the massive weight loss patient should rely more on extensive glandular manipulation for shape preservation rather than relying on the skin envelope for shaping. Such techniques include parenchymal plication, suspension, and autoaugmentation. The evolution of a technique is presented.

Materials & Methods

A retrospective review of 49 massive weight loss patients who underwent a modified Ribeiro technique with a superomedial pedicle mastopexy and suspension by an inferior dermoglandular flap. The current procedure involves incorporating the lateral intercostal artery perforator flap (LICAP flap) and medial breast pillars additionally to the inferior dermoglandular Ribeiro flap. This essentially (1) auto-augments the upper pole, (2) narrows the wide breast, (3) provides an internal sling, and (4) redefines and secures the inframammary fold.

Results

Forty-nine patients were included in the series. The average age was 42.8 years, average body mass index (BMI) was 28.2 kg/m², average weight loss was 53,9 kg, average sternal notch-NAC distance was 33.8 cm, average operation time was 118.2 minutes. In five cases a free-nipple graft was necessary. Complication rate was 4%. All patients were highly satisfied with the aesthetic result

Conclusions

Modifying the Ribeiro technique by additional usage of the breast pillars (LICAP flap) allows an autoaugmentation of the upper pole. Parenchymal shaping through plication and suspension of the breast mound should improve breast shape over time, theoretically reducing the incidence of recurrent ptosis as breast shape relies less on the often inelastic skin

envelope. The presented technique applies a familiar and reliable technique to improve results and maintain shape in the long, deflated, massive weight loss breast.

11.12 EXTENDING CONSERVATIVE TREATMENT FOR BREAST CANCER THANKS TO ONCOPLASTIC TECHNIQUES: IS IT SAFE FOR TUMORS UP TO 5 CENTIMETERS?

Francesca DE LORENZI, Pietro LOSCHI, Paolo VERONESI, Gabriel HUBNER, Marco COLLEONI, Roberto ORECCHIA, Mario RIETJENS, Viviana GALIMBERTI – Milan, Italy

Introduction

Oncoplastic surgery (ONC) may extend the indications for breast conservation, initially indicated for early breast cancer. Plastic surgery techniques allow wide excisions and prevent breast deformities by the immediate reconstruction of large resection defects, improving cosmetic outcomes, even in case of large quadrantectomies. Nowadays, this approach has been already used for pT2 tumors (2 to 5 cm at final histology), originally treated with mastectomy. No long term oncologic follow-up has been published. The aim of the study is to demonstrate that ONC is a safe and reliable treatment for managing invasive primary T2 breast cancer.

Materials & Methods

We compared a consecutive series of 193 T2-patients who underwent ONC (study group) with 386 T2-patients who underwent mastectomy (control group) over a prolonged period of time. The endpoints evaluated were Disease-free survival (DFS), overall survival (OS), cumulative incidence of local recurrence (CI-L), regional recurrence (CI-R), and distant recurrence (CI-D), all measured from the date of surgery.

Results

OS and DFS are similar within the two groups at 10-yr. The incidence of local events is slightly higher in the oncoplastic group, while the incidence of regional events is slightly higher in the mastectomy group. These differences are not statistically significant. The cumulative incidence of distant events is similar within the two groups.

Conclusions

Since the two groups are well balanced, any difference in OS or DFS is due to different surgical approaches. Hence, the type of resection did not influence the clinical outcome of the disease. To our knowledge, the present study provides the best available evidence to suggest that oncoplastic approach is a safe and reliable treatment for managing invasive pT2 breast cancers.

11.20 THE CORRELATION BETWEEN BODY MASS INDEX (BMI), TIMING OF SURGERY, AND PERIOPERATIVE MORBIDITY IN FREE FLAP BREAST RECONSTRUCTION: DEFINING A BMI THRESHOLD TO ASSIST DECISION-MAKING

Margarita MOUSTAKI, Susan HENDRICKSON, Jian FARHADI, Paul ROBLIN
London, UK

Introduction

There has been a steady increase in the number of obese patients seeking autologous breast reconstruction. Previous studies have demonstrated a higher risk of complications in this patient cohort. We aimed to quantify the association between BMI and perioperative morbidity in immediate and delayed free flap breast reconstruction and to determine a BMI threshold above which the risk of complications is increased.

Materials & Methods

All patients who underwent free flap breast reconstruction by the two senior authors over a 6-year period were retrospectively identified. Demographics (including age, BMI, smoking status, co-morbidities, adjuvant therapies, and timing and type of reconstruction) and complications (including infection, seroma, haematoma, wound healing problems, flap necrosis, medical complications and incidence of overall complications) were recorded. A multivariable logistic regression analysis was performed.

Results

In total, 425 women who underwent 492 free flap breast reconstructions (of which 74% immediate and 26% delayed) were included in our study. The mean BMI was 29.2 kg/m² (18.8 – 45.3 kg/m²). BMI and timing of reconstruction in relation to mastectomy surgery were both significantly associated with overall perioperative complications rates ($p < 0.05$). In immediate reconstructions, the risk of suffering any complication was greater than 50% in patients with BMI > 34 kg/m². When controlling for BMI, the risk of any complication was significantly lower (40% less in average) in those undergoing delayed reconstruction ($p = 0.04$).

Conclusions

Increased BMI is a significant risk factor for perioperative morbidity in free flap breast reconstruction. This data can assist reconstructive surgeons in counselling obese patients wishing to undergo reconstruction. The identification of a discrete BMI threshold value (34 kg/m²) in immediate

reconstructions, above which complications are more likely to occur than not allows surgeons to provide patients with practical information about the level of risk. In this patient population, delayed autologous reconstruction can be offered as an alternative, lower-risk approach.

11.32 AN INNOVATIVE PERCUTANEOUS TECHNIQUE FOR INFRAMAMMARY FOLD CREATION AND IMPROVED BREAST PROJECTION AND MASTOPEXY

Moustapha HAMDI, Elisabeth KAPPOS, Alex ANZARUT, Assaf ZELTZER
Brussels, Belgium

Introduction

Creation of a well-defined inframammary fold (IMF) is integral to achieving symmetrical and aesthetic results. Several techniques have traditionally been used under direct vision through an open incision. We present our experience with a novel percutaneous technique for IMF creation and improvement of breast projection.

Materials & Methods

Starting point is in the axillary region to camouflage the suture knot. The lipofilling cannula is passed in through one incision, tunneled subcutaneously, and exited out the next incision. The suture is placed into the cannula and passed around the circumference of the breast footprint after stab incisions have been made. The cannula is withdrawn in a retrograde fashion to tunnel the suture subcutaneously.

After completion of two passes in different anatomical levels around the breast circumference, the suture is tightened to achieve the desired IMF definition and breast projection. A video will be shown during the presentation.

Results

From 2011 to November 2015, 180 patients have undergone percutaneous purse string IMF creation. 70% of the patients underwent this procedure to improve breast projection only either after flap or fat grafting surgery. One patient had axillary pain, which was relieved by loosening the stitch. Redo procedures were done in 25 patients (14%). There was neither infection nor exposure of the stitch. With the longest follow-up of 48 months, patients reported high satisfaction with aesthetic outcome.

Conclusions

This percutaneous purse string technique is an innovation designed to complement the emerging field of lipofilling for breast reconstruction. The technique is safe, easily reproduced, and provides excellent results. Breast IMF and projection are immediately improved without the need for external incisions and resultant scars.

11.44 THE FAT AUGMENTED LATISSIMUS DORSI (FATAL-D) FLAP IN DELAYED BREAST RECONSTRUCTION: CAN WE OPTIMIZE OUTCOMES IN IRRADIATED PATIENTS?

Efterpi DEMIRI, Dimitrios DIONYSSIOU, Antonios TSIMPONIS, Christina-Olga GOULA, Leonidas PAVLIDIS – Thessaloniki, Greece

Introduction

Although free abdominal flaps consist the gold standard in delayed breast reconstruction, latissimus dorsi-based methods may offer alternative reconstructive options. This retrospective study aims to compare outcomes of delayed breast reconstruction using the fat-augmented latissimus dorsi (FATAL-D) autologous reconstruction and the latissimus dorsi (LD) plus implant-based reconstruction in previously irradiated women.

Materials & Methods

We reviewed the files of forty-five patients (31-73 years), who underwent delayed LD-based breast reconstruction between 2010-2015; all women had received post-mastectomy radiation therapy. Twenty-one patients (Group A) had an extended FATAL-D flap reconstruction and twenty-four patients (Group B) a LD plus implant reconstruction. Patients' age, BMI, volume of the injected fat (Group A) or implant (Group B), secondary surgical procedures, postoperative complications and patients' satisfaction were recorded and analyzed. Students' t-test for independent variables and Mann-Whitney U-test, as well as chi-squared test were used to compare demographic data, volume, complications and patients' satisfaction scores. A value of $p \leq 0.05$ was considered statistically significant.

Results

Age, BMI and donor site complications (i.e. seroma formation) were similar in both groups ($p < 0.05$). Mean fat graft volume was 230cc (ranging from 130-340cc/session) while mean implant volume was 323cc (ranging from 225-420cc). In fourteen breasts of Group B we recorded recipient site complications, including wound dehiscence (3/24), implant extrusion (2/24) and severe capsular contraction (13/24); in Group A, an oil cyst over a FATAL-D reconstructed breast was recorded. Mean number of secondary surgeries (1.7 in Group A, 1.4 in Group B) did not show statistical difference between groups ($p = 0.07 > 0.05$). Group A patients' evaluation gave higher scores ($p < 0.04$) regarding satisfaction at the 6month-follow-up.

Conclusions

The FATAL-D flap constitutes an effective alternative option for delayed reconstruction after post-mastectomy irradiation; although multiple fat transfer sessions might be required, this method provides a pure autologous reconstruction with optimal aesthetic outcome, avoiding implant-related complications.

11.52 BREAST SHARING: NEW PERSPECTIVES ON AN OLD METHOD

Ibrahim FAKIH, Ashley NOVO-TORRES, Maria Teresa FERNANDEZ-DIEZ, Elena LORDA-BARRAGUER – Alicante, Spain

Introduction

Many techniques have been described for breast reconstruction after mastectomy throughout the decades. In many cases a significant reduction of the contralateral breast was needed for symmetry, with excess tissue being discarded. We applied the new knowledge in perforator flaps to the breast-sharing technique described by Marshall DR for an autologous, non-microsurgical breast reconstruction technique.

Materials & Methods

In the time period from June 2011 to November 2015, the breast-sharing technique was performed in 10 patients with simple mastectomy, delayed breast reconstruction and willingness for autologous non-microsurgical breast reconstruction. All of our patients received preoperative oncological screening with either ultrasound, magnetic resonance imaging, or mammography, which revealed absence of pathologic imaging in the donor breast.

Results

We present a total of 10 patients who underwent breast reconstruction surgery through breast sharing technique. Only one of them (10%) suffered major complications with total loss of the flap due to venous congestion. 6 patients (60%) incurred in minor complications with little to no repercussions on the final outcome. Minor complications consisted of: distal end fat necrosis (20%), hematoma (10%), unsatisfactory breast volume (10%) and residual symmastia (40%). The aesthetic outcomes were satisfactory and only 1 patient required a second touch-up surgery for lipofilling due to unsatisfactory breast volume. Regular follow-ups are done by the oncologist with no recurrences found up to the moment.

Conclusions

Based on our experience, we believe that patients should be well aware about the complexity of predicting complications with this technique, and surgeons should be very strict in patient selection. With some complications but good aesthetic outcomes, this method has been shown as another available method for breast reconstruction in patients with hypertrophic and ptotic breast.

12.04 BREAST RECONSTRUCTION FOLLOWING NIPPLE-SPARING MASTECTOMY: CLINICAL OUTCOMES AND RISK FACTORS RELATED COMPLICATIONS

Fabio SANTANELLI DI POMPEO, Benedetto LONGO, Marco PAGNONI, Maria Rosaria MASTRANGELI, Rosaria LAPORTA – Rome, Italy

Introduction

The aim of this study was to investigate clinical outcomes and risk-factors related complications in patients who underwent nipple-sparing mastectomy (NSM) and reconstruction..

Materials & Methods

A retrospective review, from 2004 to 2014, on 369 breast reconstructions following NSMs was performed, 81 (28.1%) were bilateral and 207 (71.9%) unilateral. Patient demographics, comorbidities, breast morphological factors, type and timing of radiotherapy, type of incision, reconstruction type and timing, implant volume and complications were collected. Chi-square and Kruskal-Wallis H were used to analyze risk factors, considering significant a $p < 0.05$.

Results

One-hundred NSMs were performed for prophylactic purposes whereas 269 were therapeutics. Fifty-five breasts (14.9%) were previously irradiated and average time elapsed between radiotherapy and NSM was 9-year, (range, 5-15 yrs). Thirteen (4.5%) patients were active smokers, while 2 (0.7%) were diabetics. Overall NSMs were performed through inframammary fold (IMF) in 61 (16.5%) cases, inferolateral IMF in 140 (38%), hemi-periareolar in 64 (17.3%) and omega pattern in 104 (28.2%). Total complication rate was 13.5% at mean follow-up of 47.98 months (range, 6-114 months). Partial-thickness and full-thickness necrosis, of mastectomy skin flap and NAC occurred in 39 (78%) and 10 (20%) breasts respectively. Overall the type of mastectomy incision was not predictor of complications ($p=0.426$), even if from univariate analysis hemi-periareolar and omega pattern incisions were significantly related to complications ($p < 0.001$; $p=0.047$). Previously radiotherapy and age > 51 yrs were significant predictors of complications, while implant volume < 330 g was a negative risk factor. No correlation was also observed between previous radiotherapy and mastectomy type access ($p=0.349$).

Conclusions

NSM followed by implant-based or autologous reconstruction has a high rate of complications and should be carefully offered to patients in whom highlighted potential risk factors (radiotherapy, age >51yrs) are identified.

13.30-15.10 Scientific Session 5 – *MICROSURGERY II: Trunk*

Moderators

Milomir NINKOVIC – Munich, Germany

Alessio BACCARANI – Modena, Italy

13.30 OUTCOME ANALYSIS OF FREE FLAP SALVAGE IN OUTPATIENTS PRESENTING WITH MICROVASCULAR COMPROMISE

Rene LARGO, Jesse SELBER, Charles BUTLER, Donald BAUMANN
Houston, USA

Introduction

Extensive flap salvage attempts are routinely performed in late-onset flap vascular crisis despite less successful flap survival rates. The present study aims to analyze the outcome of this specific patient sample to help guide clinical decision-making and informed consent.

Materials & Methods

A retrospective review of 7443 free flaps were performed on 7128 cancer patients at a single institution between 01/2001 and 03/2015. Patients with vascular flap compromise after hospital discharge were identified.

Results

Out of 7443 free flap reconstruction, 856 flaps (11.5 percent) were taken back to the operating room. Thereby, 261 flaps (3.5 percent) suffered from microvascular compromise, of which 110 patients experienced total flap loss. Seventeen flaps (0.23 percent) in 17 patients were identified as flaps with vascular compromise after hospital discharge. Amongst these 17 patients, 10 breast cancer patients and 7 head and neck cancer patients suffered from take-back after hospital discharge due to vascular flap compromise. Take-backs in these 17 patients were performed median 10 days (4-107) after free flap reconstruction. Nine (90%) out of 10 breast patients and two (28.6%) out of 7 head and neck patients with vascular flap compromise after hospital discharge underwent flap salvage attempt. Salvage procedures included thrombectomy, thrombolytic and heparin injections and re-anastomoses (11 patients), vein grafting (1), change of recipient vessels (1) and vein supercharging with cephalic turndown (1). 16 (94.1%) experienced total flap loss and 1 (5.9%) breast patient suffered from partial flap loss.

Conclusions

Most of outpatients with microvascular flap compromise undergo extensive flap salvage surgery with low flap salvage rate. Partial flap salvage in these patients may lead to long-lasting open wound treatments possibly delaying further required therapy. Patients should be counseled prior to salvage attempt about poor outcome. Our study suggests considering immediate second line reconstruction than extensive flap salvage procedures.

13.42 OUTCOME AFTER REVISION OF MICROVASCULAR FREE DIEP, SIEA AND SGAP FLAP FOR AUTOLOGOUS BREAST RECONSTRUCTION

Anne-Sophie VANSCHOONBEEK, Gerd FABRÉ, Lloyd NANHEKHAN, Marc VANDEVOORT – Leuven, Belgium

Introduction

Microvascular free tissue transfer for breast reconstruction plays a significant role in the management of breast cancer. Flap failure following microvascular reconstruction of the breast is a devastating complication, not only for the patient, but also for the surgical team, and revision of a compromised breast reconstruction is very challenging. The aim of this study was to review the different characteristics of revision in DIEP, SIEA and SGAP flaps, and to evaluate the final outcome of microvascular revision of DIEP, SIEA and SGAP flaps for breast reconstruction.

Materials & Methods

A retrospective chart review was performed for all patients who underwent an autologous breast reconstruction with a DIEP, SIEA and SGAP flap at our department between August 1997 and December 2013. The number of revisions, time to revision, causes of revision and outcome after microvascular free flap revision were analyzed.

Results

A total of 1562 free flaps were performed during the study period, of which 4.42% required urgent exploration. The DIEP flaps (3.38%) have statistically significant lower revision rates compared to SIEA flaps (11.76%) and SGAP flaps (8.42%). Microvascular difficulties within a DIEP flap occur at a median time of 29 hours postoperatively. SIEA flaps show a late onset of flap failure, with a median time of 74,5 hours postoperatively. The median time to revision within the SGAP flap group was 24 hours. Venous insufficiency was the main cause for revision of DIEP flaps (86,7%) and SGAP flaps (62.5%). SIEA flaps mostly fail due to an arterial problem (62.5%). The revision failure rate was 40,6%. SIEA flaps (62.5%) have a higher revision failure rate compared to DIEP flaps (37.8%) and SGAP flaps (12.5%). Only 3 of 7 DIEP flaps survived after a second revision, and 0 of 3 SIEA flaps survived a second revision. We found a statistically significant difference ($p < 0.001$) in outcome of revision in DIEP flaps in correlation to the time to revision. Our overall flap failure rate, with or without revision, was only 1.79%. The overall flap failure rate amounted 1.28% in DIEP flaps, 7.35% in SIEA flaps and 1.05% in SGAP flaps.

Conclusions

The DIEP flap remains the most reliable flap for microvascular breast reconstruction and is therefore the preferred choice for breast reconstruction. SIEA flaps are only performed when no suitable perforator for a DIEP flap is present, since it has a significant higher revision and overall flap failure rate. Multiple revisions are no longer performed, as the outcome after more than one revision is very disappointing. The difference in cause of revision between the different flaps led to the introduction of some technical refinements, in order to minimize the revision rate.

13.50 PREDICTORS OF SURGICAL OUTCOMES IN DIEP FLAP BREAST RECONSTRUCTION

Dmytro UNUKOVYCH, Camilo HERNANDEZ GALLEGO, Helena AINESKOG, Andres RODRIGUEZ, Maria MANI – Uppsala, Sweden

Introduction

The deep inferior epigastric perforator flap (DIEP) is offered to women as a standard and safe procedure for autologous breast reconstruction. The DIEP has been utilized in most centers with low rates of reconstruction failures. The aim of this study was to identify factors associated with flap failures and other reoperations.

Materials & Methods

A retrospective study of all consecutive patients undergoing DIEP procedures during 2007-2014 was conducted. The following factors were considered: age, smoking, BMI, previous abdominal surgery, parity, radiotherapy, endocrine treatment, laterality, academic year, number of microsurgeons, flap weight, perforator number and row, ischemic time, coupler size and number of venous anastomoses. Reasons for reoperation were divided into flap circulation-related and others (hematoma, bleeding, seroma, infection- all in the breast).

Results

503 procedures were performed; 57% unilateral and 43% bilateral. Patients mean age was 51 year (range 27-72), BMI 26.2 kg/m² (range 19.5-40.0); 8% were obese, 10% had hypertension, 2% diabetes, 36% received tamoxifen, 55% preoperative radiotherapy, 40% had abdominal scars, 1% were smokers. Total surgery time was 318? (range 138-558), with average flap ischemic time 56? (range 14-127). Mean flap weight was 495g (range 150-1700) and more than one vein was used in 44%. Reoperations were due to arterial (4%) or venous (1.8%) thrombosis, bleeding-3.2%, hematoma-1.8%, partial flap loss-1.2%, fat necrosis-3.8%. Flap failure rate was 1.0%. In the univariate analyses, factors associated with reoperation were tamoxifen (OR: 1.89, p=0.046), nulliparity (OR: 0.31, p=0.016), and single vein (OR: 0.37, p=0.000), however only nulliparity remained significant in the multivariate analyses (OR: 0.32, p=0.021).

Conclusions

Current study shows favourable surgical outcomes with low number of complications. Nulliparity was found to be a predictor of reoperation; the number of venous anastomoses as well as tamoxifen may also play a role and should be taken into consideration.

13.58 BILATERAL BREAST RECONSTRUCTION WITH THE DIEP FLAP PROVIDES ADEQUATE TISSUE IN SLIM PATIENTS

Maria MANI, Samer SAOUR, Paul HARRIS, Stuart JAMES – Uppsala, Sweden

Introduction

Thin women have not traditionally been considered ideal candidates for bilateral autologous breast reconstruction. The purpose of this study was to assess the suitability of the deep inferior epigastric perforator (DIEP) flap for bilateral breast reconstruction among slim patients. We hypothesise that a low body mass index (BMI) does not contradict an adequate reconstruction of breast volume with DIEP flaps nor is it associated with more complications.

Materials & Methods

All patients undergoing bilateral DIEP flap reconstruction, at a dedicated cancer hospital, 2010-2015 were included. A retrospective review of the patients' case notes was carried out. Flap weight was compared to mastectomy specimen weight and complications were analysed according to the Clavian-Dindo scoring system. The patients were analysed in subgroups according to BMI.

Results

A total of 118 patients (236 flaps) were included; Slim (BMI<25) n=30 patients, Traditional (BMI 25-30) n=44 patients, Obese (BMI>30) n=44 patients. Specimen weight increased with higher BMI; Slim 349 g (Standard deviation (SD) 153), Traditional 580 g (SD 190) and Obese 793 g (SD 197) (p<0.001). The specimen weight to flap weight ratio was 1.07 for the Slim group, 0.88 for the Traditional group and 0.89 for the Obese group (p<0.05). Percentage of patients with any complication was 27% in the Slim group, 41% in the Traditional group and 43% in the Obese group (p>0.05). Specific flap complications were found among 3% of the Slim patients compared to 25% of the Traditional patients and 34% of the Obese patients (p<0.05).

Conclusions

The DIEP provides adequate volume for bilateral breast reconstruction among slim patients without increased overall complication rate.

**14.06 OUTCOME EVALUATION OF PRIMARY VS
SECONDARY DIEP FLAP BREAST RECONSTRUCTION**

Benedetto LONGO, Michail SOROTOS, Rosaria LAPORTA, Marco PAGNONI,
Fabio SANTANELLI DI POMPEO – Rome, Italy

Introduction

Although DIEP flap may provide excellent breast reconstruction, complication and poor results may still occur. We aimed to compare primary (immediate, delayed) vs secondary (revisional) DIEP flap breast reconstruction (DFBR) to predict complications and outcomes.

Materials & Methods

Four-hundred-thirty-one consecutive DFBR performed from 2004 to 2015 were retrospectively analysed. Patients were divided in Group A (GA) primary and Group B (GB) secondary cases. Patient demographics, comorbidities, operating time, flap and donor site complications were collected. Chi-square and Kruskal-Wallis H tests were used to compare groups with $p < 0.05$ statistically significant.

Results

In GA (393 flaps) 363 were unilateral and 30 bilateral, while in GB (38 flaps) 28 were unilateral and 10 bilateral. Groups were homogeneous regarding patients' demographics and flap characteristics. Mean age was 51.5 in GA while 54.5 in GB. Mean operative time in primary was 4.58hrs in unilateral and 7.18hrs in bilateral, while in secondary reconstructions was 5.02hrs respectively and 7.54hrs. Circumflex scapular vessels were most commonly used in both groups for arterial and vein anastomosis (GA=56% and GB=55.3%) ($p > 0.05$). No statistically significant difference was noted in operating times, perforator numbers, and donor site complications between groups ($p > 0.05$). Differences in flap related complications (partial necrosis, total necrosis, venous thrombosis etc.) were not statistically significant except for arterial thrombosis ($p = 0.013$) and sieroma formation ($p = 0.001$) in favour of GA.

Conclusions

Secondary DFBR showed higher statistically significant incidence of arterial thrombosis and sieroma formation, thus demonstrating that timing does influence the outcome.

14.14 CYCLOOXYGENASE -2 INHIBITOR AND FREE FLAP FAILURE AFTER AUTOLOGOUS BREAST RECONSTRUCTION

Christian BONDE, Hoda KHORASANI, Jens HOEJVIG, Henrik KEHLET
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Introduction

A key component of modern analgesics are the use of multi modal opioid sparing analgesia (MOSA). In the past, our analgesic regime after autologous breast reconstruction included either NSAID (brufen 400 mg/12 hours; 2007-2011) or a selective cyclooxygenase -2 inhibitor (CX2) (celebrex 200 mg/12 hours; 2006, 2012-2014). CX2s could be superior to NSAID due to the well-known side effects from NSAID (increased risk of bleeding/gastrointestinal ulcers). However, CX2s have been reported to cause a massive increase in flap failure rates, from 7% till 29%(Al-Sukhun et al. 2006). We report our experience with using CX2 as part of our postoperative MOSA.

Materials & Methods

132 unilateral, secondary, autologous breast reconstructions were performed (DIEP or MS-TRAM) in the NSAID period and 128 in the CX2 period. The same surgical team operated all patients. Data were collected prospectively in a database and a retrospective review were performed to compare the two periods with special focus on reoperations due to bleeding, haematomas or flap thrombosis/failure. Comparisons between the CX2 and NSAID were performed using Chi-square statistics and p values < 0.05 were considered statistically significant.

Results

Median age, ischemia time, blood loss and operating time were similar in the two periods.

Significantly more patients were re-operated due to postoperative haematoma in the NSAID group (n= 13/132, 9.8%) when compared to the CX2 group, (n=4/128, 3.1 %), p=0.02.

We found no difference in flap loss between the NSAID (n=2/132; 1.5%) and the CX2 group (n=3/128, 2.3%), p=0.63. No patients suffered thromboembolic complications (DTV /pulmonary embolism) and no patients had gastrointestinal bleeding.

Conclusions

Multimodal analgesia with CX2 is safe in free flap surgery and seems superior to NSAID as we find less risk of postoperative haematomas compared to NSAID and no increase in flap failure.

14.22 LATERAL THIGH PERFORATOR (LTP) FLAP FOR AUTOLOGOUS BREAST RECONSTRUCTION

Stefania TUINDER, René VAN DER HULST, Robert ALLEN, Arno LATASTER
Maastricht, The Netherlands

Introduction

The lateral thigh region, as donor site for breast reconstruction, is a good alternative if the abdomen cannot be used. The constant presence of septocutaneous perforators in the lateral thigh region, running between the tensor fasciae latae and the gluteus medius and minimus muscle, has already been demonstrated with anatomic and radiological studies.

Materials & Methods

52 consecutive LTP flaps were performed for breast reconstruction in 35 patients. 22 LTP were immediate reconstruction en 30 delayed reconstructions. Patients demographics, flaps characteristics, operative technique and time, length of hospital stay and outcomes were registered.

Results

52 LTP flaps were successfully performed: mean weight of the flaps was 450 g, mean measure of the flaps was 21.5 x 7.8 cm, mean pedicle length was 7 cm. The scar at the donor site was oriented in different ways depending on the desire and shape of the patient. No major complication occurred: minor complications were treated conservatively.

Conclusions

The LTP flap is the second choice (if DIEP flap can't be performed) in our institution for autologous breast reconstruction: it can be dissected in supine position simultaneously with the mastectomy en/or dissection of the mammary vessels, it has a long pedicle with a good caliber, the scar at the donor site can be often hidden under the underwear even improving the shape of the patients.

14.34 AUTONOMIZATION OF DIEP FLAP FOUR YEARS FOLLOWING TRANSFER. REPORT OF CLINICAL EVIDENCE

Matteo ATZENI, Benedetto LONGO, Jacopo FRATTAROLI,
Fabio SANTANELLI DI POMPEO – Rome, Italy

Introduction

Controversy surrounds the question whether free flaps remain dependent for blood supply on their vascular pedicle or if there is an autonomization by neovascularization from the surrounding wound bed, especially in case of smoking or radiotherapy. This becomes important when flap shaping or repositioning is performed.

Case Report

A no-smoking 44 years old patient with left breast cancer underwent to upper outer quadrantectomy and 4 month after, because of positive margin, to a type VI skin sparing mastectomy with immediate DIEP flap reconstruction and contralateral mastopexy. Deep inferior epigastric artery and vein (IEA+V) were anastomosed to the circumflex scapular ones, while the superficial inferior epigastric vein to the thoracodorsal vein. Nipple areola complex (NAC) was repositioned as free graft after intraoperative negative ductal pathology. No further radiotherapy was administered. After one year the patient underwent left breast lipofilling and right mastopexy revision to improve aesthetic outcomes. Four years later, a wide excision was performed due to a local recurrence at the upper outer quadrant border of the flap. The IEV was severed during surgery, a progressive venous congestion involving the whole flap during immediate postop was observed. Artery and vein perforator doppler signals were positive, and decision was taken not to re-explore the flap. In the following 5 days, the flap slowly regained its normal aspect, showing no sign of liponecrosis with optimal aesthetic results at five month postop.

Conclusions

The incorporation of both superficial and deep venous systems in DIEP flap harvesting may improve venous drainage and could save the flap in the case of accidental or necessary sacrifice of deep venous pedicle. In the case reported both vein pattern have been severed thus proving for a 4 year postop autonomization. As far as we know this is the first literature report of positive outcome.

14.42 BREAST RECONSTRUCTION USING LUMBAR ARTERY PERFORATOR FLAPS: SECONDARY CORRECTIONS

Dries OPSOMER, Britt COLEBUNDERS, Phillip BLONDEEL,
Koenraad VAN LANDUYT – Gent, Belgium

Introduction

The lumbar artery perforator (LAP) flap is considered an alternative for breast reconstruction in patients in whom a deep inferior epigastric artery perforator (DIEAP) flap is not possible. Shaping of this flap is considered easier, compared to other flaps due to the quality of the lumbar fat and the gluteal extension.

Materials & Methods

We performed a retrospective study of 30 patients who underwent a breast reconstruction with a LAP flap between October 2010 and December 2014, documenting the secondary procedures necessary to achieve symmetrical breasts as well as the corrections needed to improve donor site morbidity.

Results

Twenty unilateral and ten bilateral breast reconstructions with a LAP flap were performed. In nine patients fat grafting was performed to redefine the footprint (9/30). Three patients underwent fat grafting to augment the reconstructed breast (3/30). Remodelling of the reconstructed breast by medializing the flap, mastopexy or correction of the inframammary crease was performed in six cases (6/30). In the unilateral cases lipofilling of the contralateral breast was performed in four cases (4/20), one patient required a mastopexy (1/20). In most patients one procedure was sufficient to achieve symmetrical breasts (22/30), however in seven patients two procedures were required and one patient underwent four procedures. The scar at the donor site was treated in fifteen patients with lipofilling or scar correction (15/30). In the unilateral cases, twelve patients underwent liposuction of the flank contralateral to the donor site (12/20).

Conclusions

The LAP flap is a valuable alternative to the DIEAP flap for breast reconstruction as it provides satisfying volume and shape. Most secondary corrections can be performed as a one stage procedure at the time of nipple reconstruction, although some patients require additional sessions. Scarring at the donor site remains a sore point but can be easily treated with good results.

14.50 PROFUNDA ARTERY PERFORATOR (PAP) FLAP FOR PERINEAL RECONSTRUCTION: A NEW INDICATION

Damir KOSUTIC, Paul FULFORD, Brett WINTER-ROACH – Manchester, UK

Introduction

Reconstruction of defects following radical abdomino-perineal resection for advanced or recurrent colorectal cancers are extremely challenging from both anatomical and surgical perspective as maintaining function and providing primary wound healing are critical. Despite the common use of different flaps, they all have serious drawbacks and relatively high complication rates. Recently, profunda artery perforator (PAP) flap has been described as an excellent donor site for breast reconstruction. We report the very first series of PAP flaps used for total perineal and pelvic reconstruction following radical abdomino-perineal resection for a recurrent anal carcinoma.

Materials & Methods

Between June 2014 and December 2015, eight patients underwent PAP flap reconstruction following total perineal and pelvic resection for recurrent anal carcinoma. Data on complications and outcomes were collected prospectively. Preoperative planning identified a strong Doppler signal at the medial aspect of posterior thigh, on average 7cm below inferior gluteal crease and flap was designed transversely around it in elliptical fashion. Flap was dissected from lateral to medial subfascially until profunda artery perforator was visualized. The perforator was dissected 2 cm intramuscularly to allow adequate flap mobilization. Following full mobilization based on PAP only, the flap was transposed or rotated up to 180 degrees into the defect and sutured tension-free whilst the donor site was closed directly.

Results

There were 9 PAP flaps in total (1 bilateral case) performed in 5 male and 3 female patients. Average harvesting time was 72min. 8 flaps healed primarily while one suffered a partial loss of distal half, which following debridement, healed by secondary intention. Excellent aesthetic and functional outcomes were noted on follow up.

Conclusions

PAP flap is an excellent option in reconstructing challenging defects following radical abdomino-perineal resection. It provides excellent tissue-quality with low morbidity to the donor site as well as stable long-term functional and aesthetic outcomes.

14.58 IMMEDIATE PERINEAL RECONSTRUCTION USING INFERIOR GLUTEAL ARTERY PERFORATOR BASED FLAPS FOLLOWING CANCER RESECTION

Henrietta CREASY, Pari-Naz MOHANNA, David ROSS, Paul ROBLIN
London UK

Introduction

Immediate flap reconstruction of the irradiated perineum following cancer resection has been shown to reduce the incidence of wound complications. Uncertainty remains regarding the flap of choice, with various flaps being utilised to reduce dead space and recruit healthy non-radiotherapised tissue into the defect. Our study describes the largest series of inferior gluteal artery perforator (IGAP) based flaps in immediate perineal reconstruction.

Materials & Methods

A retrospective cohort study was performed, examining all patients at a single tertiary referral institution undergoing reconstruction of the perineum using IGAP flaps from April 2008 - June 2014. A total of 144 patients were identified, our study included those performed as an immediate reconstruction, following excision of pelvic malignancy (n=111). Retrospective case note review was undertaken, collecting data on patient demographics and perineal wound complications as a primary outcome. Secondary outcomes included length of stay, pain on sitting and perineal hernia rate.

Results

The mean age was 63 years (range 22-88), with 52.3% marginal male preponderance. The major indication for resection was rectal carcinoma (53 primary, 27 recurrent), followed by anal carcinoma (12 primary, 11 recurrent), and gynaecological malignancy (2 primary, 6 recurrent). 67.6% of patients underwent abdominoperineal excision, the remainder undergoing multivisceral resection, with 33 of the 53 female resections involving a vaginectomy. A total of 94.6% of patients had neo-adjuvant chemo-radiotherapy. At a median follow-up of 9.2 months, there was a 23.9% rate of minor wound complications, most commonly minor wound dehiscence that healed with dressings alone. Major wound complication, requiring reoperation or readmission, occurred in 16.5% of patients. There was no documented flap necrosis across the series.

Conclusions

This large series has demonstrated that IGAP flap reconstruction is a reliable, versatile option for immediate reconstruction following pelvic resections, with no flap failure and minimal donor site morbidity.

15.40-17.12 Scientific Session 6 – UPPER LIMB

Moderators

Zoran ARNEZ –Trieste, Italy

Gottfried WECHSELBERGER – Sazburg, Austria

15.40 CONGENITAL SYNDACTYLY RECONSTRUCTION OF 391 WEBSACES: AN 18-YEAR EXPERIENCE

Michael TECCE, David COLEN, Brianne MITCHELL, Michael LANNI, Benjamin CHANG – Philadelphia, USA

Introduction

Syndactyly is a common congenital hand condition that occurs as both an isolated anomaly and as part of several syndromic diagnoses. We describe the largest cohort of congenital syndactyly reconstructions to date to elucidate technical pearls for minimizing complications and need for revision.

Materials & Methods

All patients who underwent webspace reconstruction for congenital syndactyly by the senior author over an 18 year period were included in this study. Data included demographics, medical history, anatomy and severity of syndactyly, surgical technique, follow up and need for revision. Patients who underwent hand surgery prior to their first clinic visit were excluded from outcomes analysis. Logistic regression was performed to identify factors that were associated with postoperative wound complications and revision.

Results

Reconstruction was performed for 182 patients with 391 webspaces; 21 patients were referred from outside surgeons and excluded from analysis. Twenty-six patients had complications (16%) of which 13 (8%) required revision. The most common complications were web creep (n=10), scar contracture (n=6), and flexion contracture (n=5). Dorsal VY advancement flap was the most common method for reconstructing simple incomplete syndactyly and was associated with decreased risk of complication in the 3rd webspace (OR=0.427, p=0.006) while triangular flaps and skin graft was associated with increased complications (OR=2.75, p <0.001). Presence of a complicated hand anomaly did not significantly increase the likelihood of complications (p=0.21).

Conclusions

We describe the largest retrospective cohort of congenital syndactyly reconstruction to date and discuss important technical and clinical considerations to minimize postoperative complications and revisional surgery.

15.52 COMBINED NERVE AND MUSCLE TRANSFER TO RESTORE HAND OPENING, THUMB/FINGER FLEXION, THUMB/WRIST STABILIZATION AND INTRINSIC HAND FUNCTION IN TETRAPLEGIA. CASE REPORT ON A NEW CONCEPT

Andreas GOHRITZ, Jan FRIDÉN – Nottwil, Switzerland

Introduction

Patients with tetraplegia are particularly dependent on the restoration of their hand function. This case report presents a new concept in which the extensor phase was restored early by nerve transfer, while the functions of the flexors and hand intrinsic muscles were complemented by classic combined tendon transfers.

Case Report

A 45-year-old female patient sustained a C5 / 6 tetraplegia, her residual function was categorized as group OCu 4 according to the International Classification (Brachioradialis, ECRL and ECRB and pronator teres muscle strength grade M4, no active finger and thumb flexion, no active hand opening, intrinsic paralysis, thumb instability). Elbow flexion (C5) and extension (C7) were preserved. A two-stage combination of nerve and muscle transfers was conducted to reconstruct hand function:

Step 1 (11 months after accident): Supinator nerve (C5 / 6) transfer on the posterior interosseous nerve (C7/8) (S-PIN operation by Bertelli) to restore extrinsic extension functions (APL, EPL, EDC, and ECU)

Step 2 (23 months after accident): One-stage tendon transfer to restore thumb and finger flexion (BR-per-FPL, ECRL-per-FDP 2-4) and thumb palmar abduction (EDM pro-APB) and intrinsic reconstruction (Zancolli-lasso plasty). Operative thumb stabilization (EPL tenodeses, CMC arthrodesis) and correction of radial deviation the wrist (ECU tenodesis) was not necessary any more. Only 3 months after the 2nd operation, the patient regained a significant improvement in hand function, both in terms of objective measurements of grip strength (key grip and global fist) and opening of the first interdigital space, as well as from a subjective point of view. Thumb and finger extension were possible separately. The results are presented by video recordings.

Conclusions

The combination of nerve and muscle transfer promises in future optimal utilization of the advantages of both techniques in patients with tetraplegia who benefit enormously from an improvement in their arm and hand function enormously.

16.00 MICROSURGEONS DO BETTER: THE NORMAL SENSIBILITY OF THE HAND DETERIORATES AGE-DEPENDENTLY BUT CAN BE PRESERVED BY TACTILE TRAINING

Daniel SCHMAUSS, Kai MEGERLE, Holger ERNE, Jörn LOHMEYER, Hans-Günther MACHENS – Munich, Germany

Introduction

The scores used to evaluate sensibility after digital nerve reconstruction do not take the patient's age into consideration, although there is evidence that the outcome after digital nerve reconstruction is age-dependent. However, it is not clear if the normal sensibility of the hand is also age-dependent. Further, it has not yet been evaluated if longterm tactile training might prevent an age-dependent decline of sensibility of the hand.

Materials and Methods

In the first part of this study we evaluated the normal sensibility of the hand in 232 probands without specific tactile training using static and moving two-point discrimination (2PD) tests and the Semmes-Weinstein-monofilament test in N3 and N10.

In the second part of our study we evaluated the sensibility of the hand in 125 surgeons who perform microsurgical operations, thereby undergoing regular tactile training. We examined the same digital nerves using static and moving 2PD tests and compared the results to our collective without specific tactile training.

Results

In the first part of the study we found the climax of sensibility in the third decade with age-dependent deterioration afterwards in all three tests.

In the second part of the study we found significantly lower static and moving 2PD values for the sixth, seventh and eighth decade of life in the microsurgery group compared to the control group ($p < 0.05$).

Conclusions

The normal sensibility of the hand is age-dependent with the best values in the third decade and deterioration afterwards. To overcome shortcomings of classifications that do not consider the patient's age and inter-individual differences, we suggest using the difference of the 2PD values of the injured to the uninjured contralateral nerve (delta 2PD) for assessment of sensibility after digital nerve reconstruction. We further demonstrated that longterm tactile training might prevent this age-dependent decline of the sensibility of the hand.

**16.08 TRANSVERSE CARPAL LIGAMENT
RECONSTRUCTION IN CARPAL TUNNEL SYNDROME:
COMPARISON OF FOUR TECHNIQUES**

Leonidas PAVLIDIS, Gerogia SPYROPOULOU, Antonios TSIMPONIS,
Dimitrios DIONYSSIOU, Efterpi DEMIRI – Thessaloniki, Greece

Introduction

Grip strength weakness often follows standard carpal tunnel release (CTR) in carpal tunnel syndrome (CTS). It usually takes ten to twelve weeks to get back to normal values. Therefore the cost of prolonged leaves from work is extremely high. Transverse carpal ligament (TCL) is a functional element in the wrist that contributes to the carpal tunnel (CT) stability, mainly by two mechanisms mainly. At first, it represents a stable base for the thenar and hypothenar muscles. Secondly, it forms an important pulley guiding long flexor tendons to the digits and keeping their functional length to optimum levels. TCL presence protects long flexor tendons from bowstringing phenomenon. TCL reconstruction and lengthening has been proposed as a possible way for the management of CTS in the past. Along with standard lengthening techniques we have developed a novel technique in TCL reconstruction in order to keep its mechanical advantages in clinical cases.

Materials & Methods

The study enrolled 80 patients divided into two groups; Group A consisted of patients (40) who underwent CTR and group B with patients (40) who underwent TCL reconstruction, by use of four different lengthening techniques. Grip and pinch strength tests were performed in order to assess hand functionality pre and at 3, 6 and 12 weeks postoperatively. t- Paired test was used in order to evaluate results ($p < 0.05$). CT scan was performed in combination to our simulation model to assess volume alteration.

Results

TCL lengthening group (92%) achieved preoperative grip strength in three weeks while standard TCL division group (96%) achieved full grip strength in twelve weeks, which was statistically significant ($p < 0.05$).

Conclusions

The study demonstrates an alternative CTS management method with faster functional recovery and significant clinical value. Furthermore it compares a novel lengthening technique to three others previously described.

16.16 THE NOVEL USE OF ALLOGRAFTS TO SURGICALLY TREAT CHRONIC PERIPHERAL NERVE PAIN

Jonathan LECKENBY, Curdin FURRER, Bettina JUON PERSONENI,
Esther VÖGELIN – Bern, Switzerland

Introduction

Chronic pain resulting from peripheral nerve lesions represents a difficult patient group to manage. After exhausting conservative treatments, surgical intervention may be indicated. Surgical exploration and excision of the lesion can necessitate the use of grafts to achieve a tension free repair. Whilst autologous grafts are the gold standard, their use can cause donor site morbidities and risk creating secondary local or regional neurogenic pain problems. We present our six-year experience of using Avance allografts to manage this patient group.

Materials & Methods

Data was collected prospectively for all patients receiving an allograft repair of a peripheral nerve. The inclusion criteria for this study were as follows: to have surgical repair more than 21 days following injury, failed conservative treatment (except in iatrogenic nerve lesions), have pre-operative pain and have a minimum follow-up of six months

Results

77 allografts were used and 33 fulfilled the inclusion criteria. 18 grafts were used to reconstruct digital nerve defects, 8 for upper limb defects and 7 for lower limb defects. 23 patients (24 nerve grafts) suffered from pain ± hypoesthesia of which 8 patients (9 nerve grafts) had a severe allodynia. The average follow-up was 373 days (180-610). The mean pre- and post-operative pain scores were 6.8 (3-10) and 2.5 (0-7) respectively; this was a significant improvement and corresponded to a reduction in analgesia medication with 67% of patients achieving a meaningful recovery.

Conclusions

This study supports the use of allografts in chronic pain caused by peripheral nerve injuries. Both post-operative pain scores and improvement in sensibility were significantly better. The results suggest that early surgical intervention yields more favourable outcomes however this was not significant. Overall, allografts achieve excellent post-operative results and careful patient selection is crucial to achieve the best results from what is essentially elective surgery.

**16.28 COMPARATIVE COST EFFECTIVENESS OF
COLLAGENASE CLOSTRIDIUM HISTOLYTICUM
(XIAPEX®) AND PARTIAL FASCIECTOMY FOR THE
TREATMENT OF DUPUYTREN'S CONTRACTURE**

Maximilian NEUWIRTH, Anja BINTER, Wolfgang PIPAM, Matthias RAB
Klagenfurt, Austria

Introduction

Since Dupuytren's contracture is a common disorder, the costs for its surgical treatment impose a considerable burden on the healthcare system. Besides standard surgical treatment, microbial collagenase *Clostridium histolyticum* (CCH, Xiapex®) has been evaluable for patients with Dupuytren's contracture in Europe since 2011. In contrast to the surgical treatment, this procedure is simple and inexpensive, with a relatively low complication rate and no need for hospitalization. This study aimed to provide a comparative cost-effectiveness analysis for partial fasciectomy versus treatment with collagenase *Clostridium histolyticum* (CCH).

Materials & Methods

A retrospective monocentric study of the period from 2012 to 2014 comprised 40 patients with previously untreated Dupuytren's contracture of one finger. Twenty outpatients received one CCH treatment (Group 1) while 20 inpatients underwent a partial fasciectomy (Group 2). The direct pre-interventional, treatment and post-interventional costs were compared.

Results

The direct post-interventional and post-operative results were comparable. Group 1 (CCH) showed an average contracture reduction of 96.4%; in Group 2 (partial fasciectomy) it was 97.7%. There were fewer complications in Group 1 than in Group 2. Patient satisfaction in the visual analogue scale (0-10; 0= highest satisfaction) with the treatment and the final result was higher in Group 1 (treatment: 0.4 points; result: 0.85 points) compared to group 2 (treatment: 0.6 points; result: 1.78 points). Average treatment costs in Group 1 were ? 1458.60 and in Group 2, ? 5315.20.

Conclusions

CCH treatment and partial fasciectomy for Dupuytren's contracture of one finger produce similarly good results. Regarding the significantly lower costs, the low complication rates and the high patient satisfaction the treatment with CCH is more cost effective than partial fasciectomy. Despite the limited comparability, our findings are consistent with current literature.

16.36 THE EXTENSOR RETINACULUM AS A LIGAMENT REPLACEMENT FOR CHRONIC INSTABILITY OF THE METACARPOPHALANGEAL JOINT OF THE THUMB: A PROSPECTIVE STUDY

Nader CHAHIDI, Constantin DROSSOS – Brussels, Belgium

Introduction

A variety of surgical procedures for chronic instability of the metacarpophalangeal (MCP) joint of the thumb have been described: simple suture, static or dynamic ligamentoplasty or arthrodesis of the MCP joint. We describe a new technique and reporting our clinical experience using the extensor retinaculum as a ligament replacement at the MCP joint of the thumb.

Materials & Methods

The indication for this procedure is a chronic and symptomatic instability of the MCP joint caused by an insufficient ulnar or radial collateral ligament without any arthritic lesion of the MCP joint. The MCP is exposed as for a simple suture of the ligament. A strip of extensor retinaculum is harvested through a transversal incision over the wrist and used as a graft. The distal end of the graft is inserted into the base of the phalanx by a Mini-Mitek anchor and the proximal end is fixed by a second Mini-Mitek anchor precisely at the point of origin of the collateral ligament. The stability of the joint and the full flexion of the MCP are tested passively. The MCP joint is immobilized in position of function for 4 weeks. 20 patients with chronic MCP instability were treated using the described technique. 19 patients presented an ulnar and one a radial instability. The mean age was 42y (23-59y), 7 females 13 males. The interval between the trauma and surgery was 5 months (2-9M).

Results

The mean follow up was 9,5 months (4-8M). 18 MCP joints were stable, 2 patients presented a joint instability on the ulnar side of the MPC. The mean key pinch strength was 78% (95-51%) compared to the unharmed thumb. The mean MCP flexion was 45° (40-60°) with no lack of extension. The Kapandji score of mobility was in average 8/10. Two patients with unstable joint were threaded with a fusion of the MCP joint. 7 patients complaints of dysethesia on the dorsal aspect of the thumb. No complications have been reported at donor site.

Conclusions

We consider this technique simple and reproducible with good clinical results for the treatment of chronic instability of the MCP joint.

**16.44 PROPHYLACTIC VENOUS SUPERCHARGED
RADIAL COLLATERAL ARTERY PERFORATOR
PROPELLER FLAP (RCAP): IMPROVED OUTCOMES IN
PERFORATOR PROPELLER FLAPS**

Pratap DUTTA, Ingrid KIERAN, Damir KOSUTIC – Manchester, UK

Introduction

Although perforator propeller flaps provide safe and reliable reconstructive option in extremity reconstruction, partial flap necrosis, particularly at the tip of the flap occurs frequently following rotation as a result of venous congestion. A degree of venous stasis occurs initially in most cases and it can be difficult to predict whether this will only be transitory. Prophylactic venous supercharging, utilizing superficial vein at the tip of the flap is the technique we designed to overcome this problem and improve outcomes. We report on two cases of prophylactic venous supercharged radial collateral artery perforator propeller flaps (RCAP) for upper arm and forearm reconstruction from our institute.

Case Report

A 57-year-old man with 1.6mm Breslow thickness melanoma of his left upper dorsal forearm underwent 2cm wide local excision and reconstruction of defect with 13x7cm RCAP flap harvested from upper arm including dissection of superficial vein near the tip of the flap. Flap was rotated 180 degrees on a single perforator, while superficial vein was anastomosed to the previously dissected vein at the edge of a surgical defect. Another case of a 73-year-old female with recurrent melanoma on her right upper arm underwent 2cm wide local excision and reconstruction with RCAP flap harvested from dorsal proximal forearm based on a single perforator. Flap was rotated 130 degrees counter-clockwise and superficial vein at its tip anastomosed to a branch of cephalic vein. No venous congestion was observed in either case following venous supercharging. Donor site was closed primarily. Healing was uneventful and 100% of the flap surface area healed primarily with full range of motion and excellent aesthetic outcome.

Conclusions

Based on our experience, we propose prophylactic venous supercharged RCAP propeller flap as a safe and reliable option in reconstructing challenging defects in upper arm, forearm and elbow region.

16.52 FREE FUNCTIONING GRACILIS MUSCLE TRANSFER VERSUS INTERCOSTAL NERVE TRANSFER FOR RESTORATION OF ELBOW FLEXION AFTER TRAUMATIC ADULT BRACHIAL PAN-PLEXUS INJURY

Andrés MALDONADO, Michelle KIRCHER, Robert SPINNER, Allen BISHOP, Alex SHIN – Rochester, USA

Introduction

After complete five level root brachial plexus injury, free functional muscle transfer (FFMT) and intercostal nerve transfer (ICN) to musculocutaneous nerve (MCN) are two potential reconstructive options for elbow flexion. The aim of this study is to determine the role of free functioning gracilis transfer and to determine the outcomes of FFMT versus ICN to MC nerve transfers with respect to strength.

Materials & Methods

Seventy-two patients who underwent FFMT (reinnervating by SAN or ICN) reconstruction or ICN to MCN transfer for elbow flexion following a panplexus injury were included. The two groups were compared with respect to postoperative elbow flexion strength according to the British Medical Research Council (BMRC) grading system, preoperative and postoperative DASH scores, time from injury to operation, number of donor nerves as well as demographic characteristics.

Results

Average time from injury to surgery was significantly different (p-value < 0.01) in both groups (52.8 months, FFMT versus 5.4 months, ICN to MCN transfer group). In the FFMT group 32 out of 42 (76.2%) patients achieved M3 or M4 elbow flexion. In the ICN to MCN group 13 out of 30 (42.3%) patients achieved M3 or M4 elbow flexion. The difference was statistically significant between both groups (p-value < 0.01). No differences between ICN or SAN for FFMT reinnervation were found. The number of intercostal nerves used for the MCN transfer did not correlated with better elbow flexion grade. Changes in DASH scores were not statistically significant between both groups (5.8, FFMT versus 6.3, ICN to MCN transfer group).

Conclusions

Based on this study gracilis FFMT reconstruction achieves better elbow flexion strength than ICN to MCN transfer for elbow flexion after panplexus injury. The role of gracilis FFMT should be carefully considered in acute reconstruction based on this study.

17.04 CASE REPORT: SUCCESSFUL RECONSTRUCTION OF TWO LARGE FINGERTIP DEFECTS WITH TWO LATERAL GREAT TOE FLAPS IN A CHILD

Matthias RAB, Heinz BÜRGER, Maximilian NEUWIRTH – Klagenfurt, Austria

Introduction

Beside aesthetic considerations, the fingertip is the sensory and motoric link to our environment. Due to the basic reconstructive principle to replace ?like with like? and the acceptable donor site morbidity, free toe flaps gained popularity in the reconstruction of the fingertip over the past. This report presents a rare case of two strictly dorsal defects of two fingertips in a child, which were successfully reconstructed with two lateral great toe flaps.

Case Report

The ten years old girl was transferred to our hospital after she injured her right hand with a planning machine. Clinical examination showed a large dorsal osteo-tendo-cutaneous defect of the index- and middle finger from the middle phalanx to the dorsal fingertip. X-rays of the affected fingers showed a bone defect from the proximal phalanx up to the fingertips. In both fingers the palmar compartment including the flexor tendon system and the neurovascular bundles were intact with unimpaired sensibility. 5 Days after injury, successful reconstruction of the dorsal fingertips was performed with two lateral great toe flaps in a two-team approach under general anaesthesia. Healing of the flaps and the related donor sites was uneventful. Debulking of the flaps and scar revision was performed six months after surgery. At the latest follow-up the patient showed a very satisfying functional and aesthetic outcome without any donor-site-morbidity.

Conclusions

Since several techniques for reconstruction of the fingertip have been described, decision making was done considering local (composition of the defect, affected finger, hand dominance) as well as general factors (patients age, profession, personal need). Concerning our personal experience, this flap is suitable to reconstruct various shaped paediatric fingertip defects in a microsurgery skilled center.

SATURDAY 28 MAY 2016

8.30-10.10 Scientific Session 7 – GENERAL

Moderators

Paul WERKER – Groningen, The Netherlands

Gemma PONS PLAYÁ – Barcelona, Spain

**8.30 LONG-TERM OUTCOMES AND QUALITY OF LIFE
IN WOMEN WITH CROHN'S-RELATED RECURRENT
RECTOVAGINAL FISTULA TREATED WITH GRACILIS
MUSCLE TRANSPOSITION**

Daniela TASSONE, Rossella SGARZANI, Chiara GELATI,
Gilberto POGGIOLI, Riccardo CIPRIANI – Bologna, Italy

Introduction

Crohn's-related rectovaginal fistulae have significant impact on quality of life, including sexual function. They often recur after surgery. The aim of this study is to assess the efficacy of gracilis muscle transposition for Crohn's-related recurrent rectovaginal fistula and determine its impact on quality of life and sexual function.

Materials & Methods

Prospective, observational, single center study was performed on adult patients affected by Crohn-related recurrent rectovaginal fistula, undergoing gracilis muscle transposition from January 2012 to October 2014. All patients were diverted by a temporary ileostomy before graciloplasty. Clinical data were collected before surgery (age, BMI, smoking, CDAI, use of perioperative seton, previous procedures, use of immunomodulators and steroids). The success rate was measured as the percentage of patients with a healed fistula 3 months after stomal closure. SF-36 quality of life score, fecal incontinence score, and female sexual function score before surgery and 3 months after stomal closure were recorded.

Results

Rectovaginal fistula was closed in 9 of 10 patients. The success rate was stable with a mean follow-up from stomal closure of 19 months (range 4 -34). The operative time ranged from 90-150 minutes (mean, 120). The postoperative hospital stay ranged from 7-16 days (mean 10). Early postoperative complications included perineal dehiscence sutures in 2 cases. Long-term complications included perineal scar dysesthesia. We reported statistically significant improvement of QOL, sexual function and fecal continence in the post-operative data.

Conclusions

Recto-vaginal fistula closure using pedicled gracilis muscle interposition is associated with minimal morbidity and a high success rate. It is an excellent option for patients with recurrent fistulas in whom other surgical treatments have failed.

8.38 **ABDOMINAL WALL RECONSTRUCTION WITH CONCOMITANT OSTOMY-ASSOCIATED HERNIA REPAIR INCREASES SURGICAL SITE OCCURRENCES BUT NOT VENTRAL HERNIA RECURRENCES**

Alexander MERICLI, Patrick GARVEY, Salvatore GIORDANO,
Donald BAUMANN, Chalres BUTLER – Houston, USA

Introduction

The optimal strategy for abdominal wall reconstruction (AWR) in the presence of a stomal-site hernia is unclear. We hypothesized that AWR has a similar rate of success with or without concomitant repair of an ostomy-associated hernia (AWR+O) and that bridged ventral hernia repairs result in worse outcomes than reinforced repairs.

Materials & Methods

We retrospectively reviewed prospectively-collected data from consecutive AWRs performed primarily with acellular dermal matrix (ADM) at a single center over 10 years. We compared patient and surgical characteristics between the AWR and AWR+O groups. The primary outcome measures were ventral hernia recurrence and surgical site occurrence (SSO), defined as ≥ 1 postoperative complications. We used multivariate logistic regression analysis to identify potential predictive/protective reconstructive strategies and surgical outcomes.

Results

We included 363 patients (mean follow-up, 40.1 ± 20.7 months). The AWR+O group experienced significantly higher rates of SSO (46.1%) than the AWR group (33.9%; $p=0.03$); however, the rate of ventral hernia recurrence was equivalent between the groups (10.3% and 9.8%, respectively; $p=0.9$). Ostomy-associated hernias were repaired using ADM keyhole (73.7%), ADM underlay/Sugarbaker (16.2%), or primary closure without ADM (6.3%). Univariate analysis did not demonstrate a significant difference in ostomy hernia recurrence between the keyhole and Sugarbaker techniques (11.9% vs 4.8%, respectively; $p=0.7$). Surgeons employed bridged ventral hernia ADM repair with similar frequency between the AWR+O (6.4%) and AWR (8.4%) groups, which resulted in high ventral hernia recurrence rates in both groups: (40.0% and 54.2%, respectively; $p=0.7$). Both the AWR and AWR+O groups had significantly fewer ventral hernia recurrences when repairs were reinforced vs. bridged (6.3% vs. 54.2% and 9.2% vs. 75.0%, respectively; $p<0.001$).

Conclusions

Concomitant ostomy-associated hernia repair did not affect the rate of ventral hernia recurrence. Regardless of concomitant ostomy-associated hernia repair, bridged ventral hernia repairs experience higher rates of recurrence and should be avoided if possible.

8.50 WOUND HEALING ENHANCEMENT BY THE APPLICATION OF BIRCH EXTRACT TREATMENT: RESULTS OF TWO PHASE III CLINICAL TRIALS

David SANZ, Hans METELMANN, Juan BARRET – Barcelona, Spain

Introduction

Split-thickness skin grafting (STSG) is frequently performed in burn units, and rapid healing of the donor site wound is important especially in cases of repeated harvesting from the same donor site. Here we report results of two phase III clinical studies with a birch bark extract, a drug candidate for accelerated healing of partial thickness wounds.

Materials & Methods

In two Phase III trials investigating STSG donor site wounds, a total of 219 adult patients were enrolled across Europe (Spain, Czech Republic, Germany, Latvia, Bulgaria, Greece, France, Austria, Finland, Poland - ranked by the number of patients). A study design was employed which provided a result for each individual patient (intra-individual comparison): Wounds were split into two halves, with one wound half receiving the drug candidate ointment and the other wound half treated with standard of care which was defined as non-adhesive wound dressing. Wounds were photo-documented at every wound dressing change, and after blinding of these photographs three independent experts determined the time to wound healing for each wound half.

Results

The results of the blinded photo evaluation demonstrated faster wound healing of the wound halves treated with the drug candidate ointment compared to the standard of care treatment. Study results also showed the birch bark extract to be safe and well tolerated.

Conclusions

Birch bark extract treatment is well tolerated and promotes wound healing in the human clinic. This is a new and promising treatment for burns, donor sites and chronic wounds.

**8.58 ULTRASOUND GUIDED BLEOMYCIN
SCLEROTHERAPY FOR LOW-FLOW
VASCULAR ANOMALIES**

Concepció LORCA-GARCIA, Beatriz BERENGUER, Elena DE TOMÁS,
Alberto PEREZ-GARCIA, Angel LANCHARRO – Madrid, Spain

Introduction

Despite the high incidence of low-flow vascular anomalies (VAs), they are still often misunderstood and therefore mistreated. Among the different treatment options, bleomycin sclerotherapy has been described as an effective tool. However, it is only used routinely in few centers. We report our experience using ultrasound guided bleomycin sclerotherapy. To our knowledge it is the largest series using this new technique.

Materials & Methods

Prospective clinical study of all slow flow VAs treated with US guided sclerotherapy between January 2008 and May 2015. Demographic data, type, size and location of VA and number and dose of sclerotherapies were registered. Effectiveness was assessed comparing pre and post treatment measurements and by subjective evaluation of 2 surgeons. All complications were recorded. Binary logistic analysis was performed to study possible association of different variables with outcome.

Results

Fifty six patients were included in the study group, 30 female and 26 male, aged 17 days to 16 years. Venous malformation was the most common VA (48%) followed by lymphatic malformations (45%) and combined slow flow VAs (7%) and cervico-facial location was predominant(45%). Treatment was effective in 95% of the patients with dramatic size reduction and favorable subjective evaluation. Patients underwent a mean of 2 sessions with a maximum dose of 15mg/ session. Six patients experienced minor complications :1 oral ulcer and 5 skin pigmentation. Age proved an inverse correlation with complications.

Conclusions

Ultrasound (US) guided bleomycin sclerotherapy is a safe and effective tool for the treatment of slow flow VAs. US assistance is non-invasive and inexpensive and increases precision, security and efficacy

9.06 MRI, CULTURE OF SWAB SPECIMEN AND TWO-STAGE SURGERY IN SPINAL CORD INJURY PATIENTS WITH PRESSURE SORES

Rossella SGARZANI, Luca NEGOSANTI, Sara TEDESCHI, Rita CAPIROSSI, Riccardo CIPRIANI – Bologna, Italy

Introduction

Osteomyelitis is often present in patients affected by spinal cord injury and pressure sores. The treatment includes surgical debridement and antimicrobial therapy.

Materials & Methods

203 patients affected by spinal cord injury and pressure sores underwent surgical and clinical treatment between 2011 and 2015.

Between 2011 and 2013, 90 patients underwent preoperative MRI to detect osteomyelitis and ulcer swab for the etiological diagnoses of infection. Surgery was planned in two stages (debridement and reconstruction) only in case of suspect of osteomyelitis. Antimicrobial therapy was planned according to the swab culture. The analysis of the data on these 90 patients showed that the histological diagnosis of osteomyelitis was concordant with MRI only in 61% of the cases and culture of swabs was concordant with intra operative specimens only in 25% of the cases. Between 2014 and 2015, 113 patients underwent wide soft and bony debridement and reconstruction in one stage and administration of post-operative Piperacilline-Tazobactam until the antimicrobial therapy could be adjusted based on culture of intra operative specimens.

The results achieved in the two series were compared.

Results

The statistical analysis of the results achieved in the two groups could not demonstrate any significant difference in term of percentage of complete healing 77,30 %, partial deishence resolved with medications 10,84 %, need for reintervention 3,45 % or recurrence at 6 months 8,41%.

44,83% of the patients was affected by osteomyelitis and in this subgroup the complete healing was 76,92 %, comparable in the two subgroups.

Conclusions

In our cohort of patients with spinal cord injury and pressure sores preoperative MRI, preoperative culture of swab specimen and staging of the surgical procedure did not improve the results.

9.14 THE EFFICIENCY OF FRACTIONAL CO2 LASER, ADIPOSE-DERIVED STEM CELLS, REGENERATIVE EPITHELIAL SUSPENSION AND LIPOINJECTION COMBINATION TREATMENT ON FACIAL HYPERTROPHIC SCARS DUE TO BURNS

Mehmet BOZKURT, Fatih CERAN, Ozgur PILANCI, Funda SAYDAM
Istanbul, Turkey

Introduction

Facial burns often get an inextricable situation in terms of healing and long-term morbidity. Many different procedures were used to overcome these challenging topics. Although results were more promising in terms of surgeons, is inadequate for patients. We present the efficiency of fractional CO2 laser (FL), Adipose-Derived stem cells (ADSC), Regenerative Epithelial Suspension (Recell®) and lipoinjection combination treatment on facial hypertrophic scars due to burns (FS).

Materials & Methods

18 patients (M:10, F:8) among the ages of 18-35 years (Mean:25) between 2012-2015 were included. Skin thickness and perfusion were measured by ultrasonography, Vectra® computer simulation was performed for symmetric lipoinjection, biopsies were performed and hematoxylin-eosin and Movat pentachrome staining were carried out on preoperative and postoperative 12 months. ADSC-enriched lipoinjection and FL was performed, Recell® was administered following. All patients underwent a satisfaction questionnaire.

Results

Mean follow-up was 18(14-24) months. A significant improvement in skin softness, thickness, elasticity, color and symmetry was obtained in all patients. An increase in Keratinocyte, type 1 collagen; a decrease in nodular type 3 collagen and elastin, epidermal rete ridges, proteoglycan, fibronectin, neurofilament, T-cells, macrophages and mast cells was observed in the histopathological studies. A significant reduction in skin thickness, scar microcirculation and an increase in fatty tissue rates were obtained from USG, and all patients had higher scores in questionnaire.

Conclusions

FL has an active role on smoothing and regression of FS. ADSC-enriched lipoinjection is effective in the long term management of facial asymmetry. The Recell® application increases the amount of keratinocytes and provides significant skin quality.

**9.22 MICROSURGICAL AND INTERVENTIONAL THERAPY
OF CHRONIC SEROMAS AND LYMPH FISTULAS:
A NOVEL APPROACH**

Nicole LINDENBLATT, Gilbert PUIPPE, Sophia KAISER, Farid REZAEIAN,
Pietro GIOVANOLI – Zurich, Switzerland

Introduction

The treatment of postoperative seroma and chronic lymph fistula is challenging, especially in immunosuppressed patients with reduced tissue adhesion. Currently there is no proven prevention or therapeutic strategy. Based on our experience in the treatment of chronic lymph fistulas in immunosuppressed patients, we propose a novel treatment concept.

Materials & Methods

A standardized staged approach was chosen depending on wound status (open/closed) and presence of immunosuppression. We proceeded either directly to surgery (microsurgical lymphatic ligation (mLL), lympho-venous anastomosis (LVA)) or alternatively to sclerotherapy with OK-432. Sclerotherapy alone was successful in 92% of the cases. Herein we specifically present the results of the microsurgical therapy.

Results

Between 06/2014 - 11/2015 9 patients underwent surgical revision of chronic seroma / lymph fistula of the groin (n=7) or knee region (n=2). All patients were pretreated with negative pressure wound therapy and multiple surgical wound revisions. In 3 patients sclerotherapy was attempted without success. Mean duration of seroma was 157 days (range 13-593). 4 patients were immunosuppressed after solid organ transplantation. 7 patients received femoral cut-down for cannula insertion for extracorporeal circulation in the context of heart- or lung transplantation (n=4) or implantation of a left ventricular assist device (n=3). One patient had knee joint replacement and one underwent vessel reconstruction with PTFE grafts after sarcoma resection.

Intraoperative ICG visualization of lymph vessels was performed, and severed lymph vessels were treated with mLL. LVA was performed in 2 cases. In 2 patients an additional ALT flap reconstruction was performed. Complete healing was recorded in 7 out of 9 patients by surgery alone. 2 patients received additional sclerotherapy with OK-432 for small residual seroma.

Conclusions

Chronic seromas and lymph fistulas represent an ongoing challenge especially in immunocompromised patients. A multimodal approach of super/microsurgery and interventional therapy may have complementary effects and represents a novel approach with promising results.

9.30 BREAST RECONSTRUCTION AND TREATMENT OF LYMPHEDEMA: THE NEXT STEP

Dietmar ULRICH, Marijn HAMEETEMAN, Hanneke TELEMANS, Dalibor VASILIC – Nijmegen, The Netherlands

Introduction

Upper-extremity lymphedema is a frequent complication in patients treated for breast cancer. Our prospective study was designed to analyse the effect of different surgical techniques for treatment of upper limb lymphedema (power-assisted liposuction (PAL), lymphatic venous anastomosis (LVA), autologous lymph node transplantation (ALNT)) in combination with autologous breast reconstruction after breast cancer surgery.

Materials & Methods

60 patients with autologous breast reconstruction and simultaneous correction of secondary lymphedema were included. In 12 patients with non-pitting edema, reconstruction was performed with DIEP-, SGAP- or PAP-flap and PAL. 20 patients with pitting edema received a reconstruction with simultaneous LVA, 28 patients with pitting edema and missing superficial lymph collectors a DIEP or PAP flap in combination with ALNT. Lymphedema was measured preoperatively and after 1, 3, 6, and 12 months by water displacement and 3D stereophotogrammetry measurements. Beside, LYMQOL was measured.

Results

All microsurgical breast reconstructions could be performed successfully. In the group with LVA, a significant edema reduction could be detected already 1 month after operation. Even after 12 months, arm volume was significantly reduced. In patients with an ALNT, improvement could be observed after 12 months. One month after operation, patients with PAL showed a significant improvement of lymphedema that remained until the 12th month. LYMQOL showed a significant improvement in quality of life in all patient groups.

Conclusions

In our opinion, the combined treatment of autologous breast reconstruction and treatment of upper extremity lymphedema represents the next step in reconstructive breast surgery. The combined treatment of free flaps and techniques such as PAL, LVA, and ALNT can improve quality of life in breast cancer patients with lymphedema problems.

9.42 SINGLE STAGE MICROVASCULAR FREE COMPOSITE BONE AND SOFT TISSUE RECONSTRUCTION FOR THE DEFECTS OF THE LOWER EXTREMITY WITH CHRONIC OSTEOMEYLITIS DUE TO CIVIL WAR INJURIES: FLAP&FIX APPROACH

Ali Riza ERÇÖÇEN, Serds ZENGİN, Ali Ertan ÇAPAR – Istanbul, Turkey

Introduction

Chronic osteomyelitis of the lower extremities due to inappropriate treatment of open fractures remains to challenge and requires an aggressive surgical treatment, such as extensive serial debridements, negative pressure wound therapy with instillation, eradication of infection, and vascularized free tissue transfer for one stage reconstruction plus less invasive stabilization system(LISS) so called Flap&Fix approach.

Materials & Methods

Sixty-six patients who had 68 posttraumatic localized/diffuse osteomyelitis of the lower extremity with or without soft tissue defect due to civil war(gunshot or explosive) injuries treated with the flap&fix protocol between 2011 and 2015. The bone defects were located in the femur (n=18),in the tibia (n=36), in the calcaneus (n=8), in metatarsal bones(n=6). The length of segmental bone defect ranged from 4 cm to 22cm, and 56 patients had overlying soft tissue defects ranged from 3x7cm to 17x26cm. The duration from injury to the reconstruction ranged from 28 days to 3 years. Fifty-eight patients had vascularized single/multiple segments of fibula ± peroneal perforator flap or soleus muscle flap, and eight patients had vascularized iliac bone flap.

Results

Only one fibula flap with double barrel bone segments was lost totally due to venous occlusion, and was reconstructed with a iliac bone flap later. The most common causes of the infection were *A.baumannii* and *K.pneumoniae*. Partial skin flap loss was observed in two cases. Follow-up period ranged from 3 months to 4 years, and the overall primary bone union rate was 100%, and average time to overall uninon was 5.6 months. Donor site problems were partial skin graft loss in two patients, suture dehiscence in one patient, and contracture of the flexor hallucis longus muscle in one patient.

Conclusions

Compared to previously reported microvascular staged or conventional two-stage segmental bone reconstruction series, one stage reconstruction with Flap&Fix protocol provides very successful functional results.

9.54 RECONSTRUCTION OR AMPUTATION? LOWER LEG RECONSTRUCTION WITH A FREE MICROVASCULAR GRACILIS MUSCLE FLAP IN A 94-YEAR OLD PATIENT: PUSHING THE LIMITS?

Ahmet BOZKURT, Lara KASPER, Eckhard PRIEPKE, Ulrich RIEGER –
Frankfurt, Germany

Introduction

The demographic change is characterized by an increasing number of elderly patients. According to German statistic agencies, the proportion of patients ≥ 80 years will increase from 4,4 million (5%) in 2013 to more than 9,0 million (12%) in 2060. Particularly, the treatment of lower extremity defects represents a major challenge. The following case includes a 94-years old patient with a free microvascular gracilis muscle transfer for reconstruction of the lower leg. Furthermore, we will give a short overview of published data and literature.

Case Report

A 94-years old female patient suffered from a 3° open distal tibial fracture with a soft tissue defect of 8x7cm. The patient was very active and self-sufficient. After primary treatment, she was referred to our microsurgical center since the patient refused amputation and asked for second opinion. We decided for a free gracilis muscle transfer since local flaps and a cross-leg procedure were not practicable. Intraoperatively, the posterior tibial artery appeared calcified, but with a sufficient blood flow. The posterior tibial vein was insufficient and we, therefore, chose a side branch of the greater saphenous vein as recipient vein. The artery of the gracilis flap was rarified (< 1 mm diameter). Anastomoses were performed in an end-to-side (artery) or end-to-end (vein) fashion.

The postoperative course was uneventful without any complications. Three weeks after surgery, the patient was discharged to ambulatory care with regular clinical and X-ray controls.

Conclusions

The demographic change requires a comprehensive approach considering both the biographical and biological age. To the best of our knowledge and after review of published literature, this case represents the oldest patient with a lower leg tissue defect treated with a free microvascular flap. The free gracilis muscle is a method of first choice due to a fast and safe harvesting procedure.

10.02 26-YEAR NATIONWIDE INCIDENCE OF NECROTIZING SOFT TISSUE INFECTIONS: A FINNISH NATIONAL HOSPITAL DISCHARGE REGISTER-BASED STUDY

Juha KIISKI, Tuomas HUTTUNEN, Hannu KUOKKANEN, Minna KÄÄRIÄINEN, Ville MATTILA – Tampere, Finland

Introduction

Necrotizing soft tissue infections (NSTI) are rare, but life threatening infections. Population-based incidence is not well known and there is no prior nationwide epidemiological data on incidence or trends in an European population. The purpose of this study was to determine the national incidence and trends of NSTI and length of hospital stay.

Materials & Methods

The patient data was collected from the Finnish National Hospital Discharge Register (NHDR) between January 1st, 1988 and December 31st, 2013. The study population covered the entire Finnish population over the 26-year study period. Diagnoses were recorded according to the International Classification of Disease, 9th version (ICD-9) between 1988 and 1995 and ICD-10 since 1996. Between 1988 and 1995 the inclusion criteria was a primary or secondary diagnosis of 0400A (gas gangrene) or 7294A (fasciitis, not specified else where). Between 1996 and 2013 the corresponding diagnosis codes were A48.0 (gas gangrene), M72.5 (fasciitis, not specified else where) or M72.6 (necrotizing fasciitis).

Results

A total of 1462 hospitalizations for 873 patients with a diagnosis of NSTI were registered to the NHDR between 1988 and 2013. The mean age of the patients increased from 50.5 years in 1988 to 58.8 years in 2013. National population-based incidence for NSTI hospitalization in Finland over the 26-year study period was 0.62 / 100,000 (0.71/100,000 in males and 0.54/100,000 in females). Age-adjusted incidence increased constantly with age. During the last ten years of the study period, the age-adjusted incidence almost tripled from 0.40/100,000 in 2004 to 1.18/100,000 in 2013. The mean length of stay per patient for all hospitalizations was 24.3 (SD 53.2) days.

Conclusions

The nationwide incidence of the NSTI in Finland is slightly lower than previously reported in literature with other populations. Highest age-adjusted incidence was observed in the elderly population.

10.40-12.16 Scientific Session 8 – CRANIOFACIAL

Moderators

Benoît LENGELÉ – Brussels, Belgium

Kenneth STEWART – Edinburgh, Scotland, UK

10.40 THE KEYSTONE PERFORATOR ISLAND FLAP IN NASAL RECONSTRUCTION: AN ALTERNATIVE OPTION FOR SOFT TISSUE DEFECTS UP TO 2 CM

Epameinondas KOSTOPOULOS, Christos AGIANNIDIS, Petros KONOFAOS, Grigorios CHAMPAS, Vincent CASOLI – Athens, Greece

Introduction

Nasal reconstruction has always been challenging for Plastic Surgeons. The aim of this study was to present our experience with the use of the Keystone Perforator Island Flap (KPIF) in a case series of patients with small and intermediate size nasal defects (≤ 2 cm) which will assist Plastic Surgeons in planning an alternative reconstructive surgery that will work.

Materials & Methods

The KPIF was utilized in a series of patients with nasal defects post tumor extirpation. More than one type of KPIF (type I or type III and IV) was used following the nasal subunit principle or a modified version of it.

Results

A total of 81 patients (mean age of 71 years) sustained reconstruction with a KPIF over a period of 31 months. The vast majority of patients were male (46/81 or 56.8%). A type I KPIF was used in most cases (41/81 or 50.6%), followed by type II (22/81 or 27.2%) and IV (18/81 or 22.2%). Lesions concerned all nasal subunits with a slight preponderance of the ala (27/81 or 33.3%), lateral wall (18/81 or 22.2%), and tip (17/81 or 21%). Defects' diameter ranged from 0.5 cm to 2.8 cm (mean of 1.4 cm). The mean postoperative follow up was 10.7 months (range 2-27 months). All flaps survived without any sign of venous congestion. Overall pleasant aesthetic outcomes were achieved with no major complications encountered, except minor wound dehiscence in 6 cases (6/81 or 7.4%). Whenever was possible to utilize the aesthetic subunit principle, the results were cosmetically superior.

Conclusions

It is the first time that the utilization of this flap is reported in nasal reconstruction. The versatility of the KPIF makes it a safe technique even in the hands of novice Surgeons under guidance for nasal defects up to 2 cm in diameter.

**10.48 TRI-FLAP SUBTOTAL NASAL RECONSTRUCTION:
A NEW TWIST ON AN OLD IDEA**

Yasser HIJAZI, Kian TJON TAN, Damir KOSUTIC – Manchester, UK

Introduction

Reconstruction of total and subtotal nasal defects provides the challenge of restoring the complex anatomy, function and aesthetics of the nose. Full-thickness nasal defects require reconstruction of the tri-laminar anatomy consisting of lining, support and skin coverage. Complexity of function and aesthetics restoration require donor tissue from multiple sources including free pre-laminated and regional flaps in a multi-staged fashion under general anaesthetic, - which may not be feasible or desirable in frail and elderly patients. We present a new Tri-flap concept for subtotal nasal reconstruction performed under a single general anaesthetic.

Case Report

An 84-year-old man presented with a large biopsy-proven squamous cell carcinoma of his nose involving the dorsum, both sidewalls, tip and alar subunits. CT scan revealed tumour extension into both nasal cartilages, septum and nasal bones. There were no signs of regional or distant metastases. The patient was not willing to undergo multiple general anaesthetic procedures.

He underwent near-total rhinectomy under frozen-section margin control with resection of both upper lateral and alar cartilages, entire cartilaginous and part of bony septum as well as subtotal resection of nasal bones.

The defect was reconstructed using a 'Tri-flap' approach, with bilateral superiorly-based upside-down inverted nasolabial flaps to reconstruct the lining and an obliquely-designed forehead flap to reconstruct the skin cover, sandwiching bilateral conchal cartilage grafts for the support.

Patient recovered well and underwent division of forehead flap under local anaesthetic three weeks following primary procedure. A very good aesthetic outcome was achieved with adequate airway function.

Conclusions

This case illustrates successful tri-laminar reconstruction of a complex subtotal nasal defect using the 'Tri-flap' approach to produce a very good aesthetic and functional outcome in a single general anaesthetic procedure.

**10.56 CLOSURE OF CALVARIAL WOUND DEFECTS
BY PERCUTANEOUS MESH EXPANSION, THE
REGENERATIVE ALTERNATIVE TO FLAPS**

Kimberly KHOURI, Eufemiano CARDOSO; Daniel CALVA, Roger KHOURI
Miami, USA

Introduction

From the clinical observation that puncture wounds in the 1-mm range heal with no significant scarring, we hypothesized that this regenerative ability might be harnessed to close larger defects by stacking rows of staggered 1.2-mm punctures that mesh expand the tissues around the defect to generate the tissue required for wound closure. We describe the percutaneous mesh expansion technique (PME), and present our experience with PME for closure of calvarial wound defects.

Materials & Methods

We applied PME to 43 patients 58-101 years old (mean, 72) with 44 consecutive 2.5x3.0 ? 6.0x7.0 cm full thickness calvarial defects (mean, 3.5x4.0cm) that would have all required flaps. Twenty-nine were anticoagulated for other indications, and 18 had prior scalp resections. After tumescent epinephrine anesthesia, we temporarily approximate the wound edges as much as possible by placing them under strong tension. Using 1.2-mm cutting point needles that selectively sever tissue under tension, we inflict rows of staggered alternating punctures 3-mm apart over an area 5X the defect size. This 20% mesh expansion of the surrounding area generated the tissue necessary for a tensionless wound closure with simple sutures or staples. We avoid over-meshing, especially close to the wound edges and we performed no undermining and no additional incisions.

Results

Thirty-eight (86%) of the 44 calvarial defects healed uneventfully leaving only a linear resection scar. However, of the 6 defects over 5x5 cm, two required a small skin graft. Four cases had delayed wound healing. There were no hematomas and no other significant complications.

Conclusions

Contrary to standard flap tissue transfers and to undermining with relaxing incisions, this novel procedure harnesses the body's natural regenerative capabilities to achieve complex wound closures without additional scars and without donor site defects. Because there is no undermining, it is particularly applicable to patients on continuous antiplatelet therapy.

11.04 FACIAL BONE RECONSTRUCTION WITH PREFABRICATED VASCULARIZED CALVARIUM FLAPS IN CHILDREN AND YOUNG ADULTS: LONG-TERM RESULTS

Eva RÜEGG, Paul GNIADK, Ali MODARRESSI, Denise BARATTI-MAYER, Brigitte PITTET-CUÉNOD – Geneva, Switzerland

Introduction

Reconstruction of facial bone defects is challenging, particularly in children, and the use of well-vascularized bone is mandatory to obtain stable lasting results. We report our experience of the long-term outcome of facial bone reconstruction using prefabricated vascularized calvarium flaps, including a skin graft to reconstruct cutaneous or mucosal defects.

Materials & Methods

This retrospective case series includes 50 patients who underwent 52 maxillary, malar, and mandibular reconstructions between 1988 and 2014 using prefabricated vascularized calvarium flaps. Mean age at surgery was 8.9 years (range, 20 months-23 years). Forty-nine patients suffered from noma sequels; one patient presented with a craniofacial cleft Tessier 3-11 with wide bilateral cleft lip and palate. Surgery consisted of a two-step procedure beginning with the delay of the flap based on the superficial temporal vessels and prelamination with skin grafting on the galea. Flap harvest followed at least 2 weeks later (range, 2-16 weeks), including a full-thickness calvarium fragment, which was set into the facial bone defect.

Results

Early complications concerned wound healing and infections requiring surgical revision in six patients at the recipient site and six at the donor site. There was one flap loss. One infection resulted in the partial loss of the split bone grafts used to reconstruct the calvarium defect at the donor site. Clinical long-term assessment at 15-year median follow-up (range, 1-27 years) showed good results, assuring facial height and contour. Radiological long-term results demonstrated excellent integration of the bone flap to the adjacent facial skeleton.

Conclusions

Prefabricated vascularized calvarium flap is an effective and safe reconstructive tool for large facial bony defects when mucosal or skin lining is required, particularly in growing children. It does not require microsurgical anastomosis and has a low complication rate and minor donor site morbidity. Long-term follow-up shows a perfect bone stability and integration.

11.16 ANAMNESIS AND MAGNETIC RESONANCE IMAGING (MRI) CORELATION IN TEMPOROMANDIBULAR JOINT (TMJ) DISEASES

Gökçe YILDIRAN, Mehtap KARAMESE, Osman AKDAG, Zekeriya TOSUN
Konya, Turkey

Introduction

TMJ disease patients are diagnosed with MRI and anamnesis. However anamnesis provides information about etiology, MRI provides information about treatment planning. It is aimed to present MRI and anamnesis correlation of TMJ patients.

Materials & Methods

98 patients, who had accepted to fill in the questionnaire and who had preoperative TMJ MRI, were included to our study. Questionnaire was including age, sex, painful joint laterality, pain scores(10 point, VAS), depression, bruxism, etiology questions.

77 female, 19 male patients were evaluated. 33 patients had normal MRI findings with a pain mean of 4,82. 66 patients had reduced or irreduced (abnormal) MRI findings with a pain mean of 5,58. There were no significant differences between these groups. ($p>0,05$) 30 patients who had reduced disc dislocation in MRI with a pain mean of 5,63. 33 patients who had irreduced disc dislocation in MRI with a pain mean of 5,54.

Results

There were no significant differences between these groups. ($p>0,05$) 21 of 30 patients with depressed mood had abnormal (reduced or irreduced disc) MRI (70%). 25 of 41 patients with bruxism had abnormal MRI (60,9%). 16 of 18 patients whose pain had started with dental therapy had abnormal MRI (88,8%). All of 14 patients whose pain had started with chewing or eating had abnormal MRI (100%). Patients' MRI findings were significantly different between normal and abnormal MRI group in patients who had pain started with dental therapy and eating in their anamnesis.

Conclusions

In conclusion, pain is a subjective criteria. However it is important to guess the MRI findings with the pain etiology, there is no correlation between pain and MRI. So that, VAS should not be used instead of MRI. In TMJ diseases, treatment should be planned with MRI and anamnesis synthesis.

11.24 EVALUATION OF PATIENTS, OPERATED BECAUSE OF VELOPHARYNGEAL INSUFFICIENCY WITH DYNAMIC MRI

Tugba GUN KOPLAY, Nuh EVIN, Mehtap KARAMESE, Osman AKDAG, Mustafa KOPLAY – Konya, Turkey

Introduction

Velopharyngeal failure is one of the most debated issues about cleft related to importance of speech. Video fluoroscopy, cephalometric studies, speech tests are used for diagnosis and follow up. We plan to share the patients we operated with pharyngeal flap and posterior wall augmentation comparing with dynamic MR.

Materials & Methods

Between 2010-2015, 14 patients, age of 9-29, 9 women and 5 men were operated with pharyngeal flap (9) and posterior augmentation(7). We added augmentation to 3 patients after pharyngeal flap. Follow-up was performed by speech therapists. Preoperative and postoperative endoscopic videos were taken while reading a standard text. Postoperative results were compared with dynamic MR. Patients younger than 7 years old and receiving orthodontic treatment were excluded due to artifact in image. Movement of soft palate was observed while saying “MMMM, PPPP, Pokemon”. The placement of graft, size of flap, nasal air escape area was measured.

Results

Grafts placements were as required. At sagittal images nasal air flow passage was closed for both methods. Also lateral movement was well at all patients, so surgical planning was true. There was compliance with axial escape and phonation in conversation video.

Conclusions

Velopharyngeal insufficiency is failure of soft palate to prevent the escape of air due to inability of closing pharynx during speech. Dynamic MR is available for preoperative and postoperative evaluation. Non-invasive image and video can be brought in every plan. Patient compliance is easier than endoscopic method. There is no ionizing radiation exposure as in video fluoroscopy and contrast use. Complete anatomical assessment is possible with Dynamic MR. Dynamic MR is available for diagnosis and follow up due to being fast, reliable and easy to tolerability.

11.36 TREATMENT OF CLEFT LIP SCAR AND ALOPECIA WITH ADIPOSE-DERIVED STROMAL VASCULAR FRACTION CELLS, FOLLICULAR UNIT EXTRACTION TECHNIQUE BEARD OR HAIR TRANSPLANTATION AND PLATELET RICH PLASMA THERAPY

Nuh EVIN, Osman AKDAG, Mehtap KARAMESE, Zekeriya TOSUN
Konya, Turkey

Introduction

Cleft lip scar and alopecia is a problem for male cleft lip patients. Adult male patients suffer from scar more than young and female patients, because men with cleft lip have operative scar and alopecia on this area. We aimed to treat this area combining Adipose-derived stromal vascular fraction cells (ADSCs), Follicular Unit Extraction (FUE) technique with beard or hair transplantation, PRP therapy and then evaluated scars with scar scales.

Materials & Methods

Fifteen patients were included in this study. Eight patients had only unilateral cleft lip scar and the others had bilateral cleft lip scar with prolabium alopecia. The age of the patients ranged from 19-28 years and all of them had dark hair. Initially ADSCs were obtained from periumbilical region, and applied to scarred areas under only local anesthesia. Three months after ADSCs, all patients scars and upper lip augmentation were respectively analyzed by Vancouver, POSAS scar scales and magnetic resonance imaging. Then seven patient underwent FUE technique beard transplantation and others underwent FUE technique hair transplantation for moustache reconstruction. PRP therapy was applied to the area six weeks after surgery. After transplantation, before PRP therapy and at the first year, digital photographs were evaluated by the Microsoft Paint program. Patients were followed up at 18 months.

Results

Pre-operative and post-operative photographs and scar scales were evaluated. It was concluded that all lips scars reduced after ADSCs therapy. Hair regrowth started average six weeks after surgery. After PRP therapy increase of hair growth was displayed using Microsoft paint program. A year after hair transplantation all scar tissues were camouflaged. No complications encountered.

Conclusions

For moustache reconstructions in cleft lip patient, application of scar camouflage can be used in reconstructive and aesthetic surgery.

11.44 CORRELATION BETWEEN AGE OF TREATMENT AND OUTCOME OF SPRING CRANIOPLASTY PROCEDURES

Alessandro BORGHI, Will RODGERS, Silvia SCHIEVANO, Owase JEELANI, David DUNAWAY – London, UK

Introduction

Spring cranioplasty is nowadays an established technique for treatment of sagittal craniosynostosis, proven successful in improving skull shape while shortening operating time and decreasing blood loss. In this study, a retrospective analysis of a population of patients who underwent spring cranioplasty for the correction of scaphocephaly between 2010 and 2013 at GOSH was performed and data on spring performance was collected and correlated with age and procedure outcome, to assess the effectiveness of spring insertion and provide surgical directions.

Materials & Methods

Data from 61 patients (unisutural craniosynostosis, 3 to 7 month old at the time of procedure (5.27 ± 0.91 , min 3.7, max 7 months), 2 springs inserted) were analyzed. The opening of the spring was retrieved in theater during implant and explant and from planar x-rays at follow-ups (1 day and 3 weeks). The dynamics of spring opening was correlated with the force exerted in-vivo after mechanical characterization of the spring behavior.

Results

The data showed a negative correlation between age and spring opening at implantation ($r = -0.44$, $p < 0.001$) and at time of three week follow-up ($r = -0.29$, $p = 0.036$). Age was also positively correlated with spring force at implantation ($r = 0.38$, $p < 0.001$) and at day 1 post-op ($r = 0.36$, $p = 0.007$) as well as with spring stiffness ($r = 0.319$, $p = 0.0138$). Increase in cranial index between pre-op and 3 week follow-up was negatively correlated with age ($r = -0.38$, $p = 0.008$) as well as spring force ($r = -0.34$, $p = 0.027$). Spring stiffness was not correlated with improvement in cranial index.

Conclusion

Older patients undergo larger spring forces on table and undergo lower initial opening. Younger patients show better outcomes in terms of change of cranial index.

11.52 3D-HANDHELD OPTICAL SURFACE SCANNING FOR CAPTURING SHAPE CHANGE FOLLOWING SPRING-ASSISTED CRANIOPLASTY

Maik TENHAGEN, Jan BRUSE, Freida ANGULLIA, Owase JEELANI, David DUNAWAY – London, UK

Introduction

Three-dimensional (3D) surface imaging is getting more important for diagnosis, surgical planning and evaluating outcome. 3D optical surface imaging captures surface topography without exposure to radiation and could in certain cases be the imaging method of choice. We present a novel use of 3D handheld scanning to quantify shape changes in sagittal craniosynostosis during spring-assisted cranioplasty.

Materials & Methods

Nine patients (8 male, 1 female; mean age 5.2 months) participated in a prospective pilot study after spring-assisted cranioplasty for the treatment of sagittal craniosynostosis. 3D scans were taken pre- and postoperatively in theatre and 3 week after surgery in clinic. The scans were used to measure Cephalic Index (CI), head circumference, head volume, sagittal and coronal length over the head. Measurements at all time-points (Pre- to postoperative and preoperative to follow-up) were compared. CI was used to validate 3D scans against x-rays by Bland-Altman analysis. Statistical Shape Modelling was used to calculate the 3D mean head shape of the 9 patients and the change in mean shape after surgery.

Results

Cephalic index, head volume and coronal length increased significantly at both time points ($p=0.011$ and $p=0.008$ for CI; $p=0.028$ and $p=0.008$ for volume; $p=0.012$ and $p=0.012$ for coronal length). CI increased from 70 ± 2.9 preoperatively to 74 ± 4.3 at follow-up. Mean volume increased by 6.7% and coronal length increased from 26.5 to 28.5 cm. No differences were observed between the CI measurements from 3D scans and x-rays. The mean 3D head shapes at three time-points quantified the correction induced by spring cranioplasty.

Conclusions

3D optical handheld scanning effectively captures infant head shape and allows commonly used measurements of the head shape to be calculated. 3D models of mean head shape change are a useful tool in assessing surgical outcome.

12.00 RELATING BONE STRUCTURE TO SURGICAL OUTCOMES IN SAGITTAL CRANIOSYNOSTOSIS

Naiara RODRIGUEZ-FLOREZ, Amel IBRAHIM, Owase JEELANI, Patrizia FERRETTI, David DUNAWAY – London, UK

Introduction

In children with sagittal craniosynostosis the sagittal suture fuses prematurely resulting in abnormal skull growth. This can lead to aesthetic and/or functional problems requiring surgical correction. Spring-mediated cranioplasty is a minimally invasive approach, which consists of performing a sagittal osteotomy and inserting metallic springs to remodel the skull. We investigated whether surgical outcomes of spring-mediated cranioplasty are affected by the structural properties of the underlying bone.

Materials & Methods

Parietal bone samples were collected from consented patients undergoing spring-mediated cranioplasty for sagittal craniosynostosis (n=10, average age: 5.3 months). Bone samples were fixed, cut parallel to the sagittal suture and scanned using micro Computed-Tomography (μ CT). Bones were classified as one-layered or three-layered (containing a diploë cavity) according to the 3D reconstructions. Bone surface to total volume (BS/TV) and bone thickness were measured on the μ CT scans. The shape change induced by surgery was assessed by the cephalic index (CI) measured on 3D scans of the calvarium acquired pre- and post-surgery using a 3D handheld scanner.

Results

Four out of ten bones showed a three-layered structure with the diploë cavity. BS/TV decreased significantly from one-layered bones to bones with diploë (p=0.019) and this decrease was correlated with the patient's age (Kendall's τ =-0.49, p=0.048). The increase of CI from pre-surgery to follow-up was smaller in bones with low BS/TV (τ =0.70, p=0.024) associated with bones with diploë. The average thickness of the bones was 2.2 ± 0.8 mm and thicker bones were related to smaller changes of CI (τ =-0.57, p=0.048).

Conclusions

The patients who had unilateral mastectomy have developed acquired scoliotic posture that could have a direct effect on the lateral curving of vertebral column in a long term. As a conclusion breast reconstruction and physical therapy should be kept in mind as a preventive method in patients undergoing unilateral mastectomy.

12.08 TOTAL ABLATION AND RECONSTRUCTION OF A MASSIVE FACIAL ARTERIOVENOUS MALFORMATION WITH FACE TRANSPLANTATION

Juan BARRET, David SANZ, Jordi SERRACANTA, Pablo GOMEZ, Elena ARANA – Barcelona, Spain

Introduction

Massive high flow arteriovenous malformations (AVM) are challenging tumors. When these malformations occur in the craniofacial area may become inoperable. Total ablation of the deformed tissues produces severe facial mutilations. Herein we report the first treatment of a massive cervicofacial MAV with total ablation and reconstruction with Face Transplantation.

Materials & Methods

A 46-year-old male patient presented with a massive AVM extending from the mid cervical area to the orbits. Different previous treatments included embolizations, laser treatments, partial glossectomy and radial forearm flap, among others. The patient had progressive deterioration of the malformation and the facial deformity, with life threatening massive oral hemorrhages. His airway was secured with a permanent tracheotomy and feeding through a PEG tube. The patient was declared inoperable with traditional techniques. Due to the severity of the symptoms and his life threatening condition, the patient was listed for face transplantation.

Results

In February 2015 the patient underwent a total ablation of the MAV and facial extirpation and reconstruction with a Facial Transplantation that included the two lower thirds of the face, mouth, tongue, pharynx and cervical skin and soft tissues. The donation consisted in a multiple organ simultaneous procurement in a non-heart beating donor. The patient had one episode of acute rejection treated with high dose of prednisone. Psychological acceptance of the new facial appearance was excellent. The patient showed good neurological recovery with near-total sensation and partial functional recovery at 9 months, recovering intelligible speech, oral intake and complete return to familial and social life.

Conclusions

Total ablation of massive cervico-facial AVM and reconstruction of the defect with Face Transplantation in one operation is feasible. Face transplantation has opened a new paradigm for the treatment of inoperable facial tumors and malformations.

13.45-15.15 Scientific Session 9 - *PRESIDENTIAL PANEL*

PLASTIC SURGERY FO MIGRAINE HEADACHES

Chair

Manfred Frey – Vienna, Austria

13.45 Introduction

Manfred FREY – Vienna, Austria

**13.50 PATHOPHYSIOLOGY AND CURRENT TREATMENT
STANDARDS OF MIGRAINE HEADACHES:
VIEWPOINT FROM THE NEUROLOGIST**

Jan VERSIJPT – Brussels, Belgium

14.10 SURGICAL TREATMENT OF MIGRAINE HEADACHES

Bahman GUYURON – Cleveland, USA

**14.40 RESEARCH ON MIGRAINE HEADACHES AND
STANDARDIZED DOCUMENTATION OF RESULTS**

Lisa GFRERER – Boston, USA

14.55 Discussion

15.45-17.37 Scientific Session 10 – AESTHETICS

Moderators

Pietro BERRINO – Genoa, Italy

Marc VANDEVOORT – Leuven, Belgium

15.45 MICRO AND NANO FAT-GRAFTING FOR SCAR TREATMENT AND SKIN QUALITY IMPROVEMENT

Semra UYULMAZ, Nicole LINDENBLATT, Farid REZAEIAN, Pietro GIOVANOLI – Zurich, Switzerland

Introduction

Autologous fat grafting has gained increasing attention and acceptance over the past decade in tissue augmentation. However, in addition to the volume effect regenerative properties of autologous fat with respect to skin texture have been observed. Therefore we were interested to study the effect of Micro- and Nanofat grafting on scar quality, hyperpigmentations and superficial wrinkles.

Materials & Methods

Autologous fat grafting has gained increasing attention and acceptance over the past decade in tissue augmentation. However, in addition to the volume effect regenerative properties of autologous fat with respect to skin texture have been observed. Therefore we were interested to study the effect of Micro- and Nanofat grafting on scar quality, hyperpigmentations and superficial wrinkles.

Results

Mean postoperative follow-up was 65 days. Mean age of patients was 41 ± 2 years. The average volume of harvested fat amounted to 176 ± 30 cc. Main harvesting areas were abdomen and flanks. In average 16.5 ± 5 cc microfat, 1.8 ± 0.5 cc SNIF and 5.3 ± 1.2 cc Nanofat were injected. Main treatment areas were scars the face, the extremities, the décolleté and radioderm of the thoracic wall after breast cancer treatment, hyperpigmentations and superficial wrinkles. Postoperative clinical evaluations showed a marked improvement of scar and skin quality and a high patient satisfaction. Fat grafting softened the scars, made hyperpigmentations less pronounced and wrinkles less conspicuous.

Conclusions

Micro- and Nanofat grafting appears to have beneficial effects in the treatment of scars and skin quality.

15.53 MIDDLE EASTERN RHINOPLASTY - A CRITICAL REVIEW OF 130 CONSECUTIVE CASES

Karima ISMAIL, Mariam ISMAIL, Taher ISMAIL – Cairo, Egypt

Introduction

Rhinoplasty in Middle Eastern patient is a challenging problem. The Middle Eastern nose differs in structure and shape from western(Caucasian) noses. The skin of the tip is thick and sebaceous; the cartilages of the tip are broad and extremely thin: subcutaneous fat is abundant at the tip: the dorsum is variable. The nasal bones are short, and the alae are flared and thick. Accordingly, special techniques should be followed in the management of these patients.

Materials & Methods

From 2010 to 2015, 130 consecutive Middle Eastern rhinoplasties were done in a single clinic by three separate surgeons utilizing the same technique. All patients were done using closed technique. Nasal hump was rasped when present. The nasal tip was supported by a collumelar strut. Tip sculpturing was achieved by tip sutures, judicial excision of tip cartilages and support by tip grafts. Subcutaneous fat excision to delineate underlying framework. Alar wedge resection was done in 90% of the cases. Assessment of the procedure was done by questionnaire, regarding patient satisfaction, functional outcome and documenting specific complaints.

Results

Surgical followup varied from a minimum of 6 months to a maximum of 5 years with an average of 3 years. 85% complied to follow up-90% of followed up cases were satisfied, 4.5% underwent secondary rhinoplasty. Complications: residual tip edema 4.5%, inadequate tip projection 2.7%, drooping tip 1.8%, alar base problems 4.5%.

Conclusions

The Middle Eastern nose represents a challenge to the plastic surgeon. Traditional techniques utilized in the management of western noses may fail to treat such noses due to their unique structure. Special techniques using tip sutures, judicial excision of tip cartilages, suitable tip grafts, and subcutaneous fat and alar base excision will yield good predictable results in these problematic cases.

16.01 QUALITY OF LIFE, PERSONALITY CHANGES AND SELF-ESTEEM AFTER RHINOPLASTY

Nikolaos PAPADOPOULOS, Demetrios KYRIAKIDIS, Othon PAPADOPOULOS, Laszlo KOVACS, Hans-Günther MACHENS
Munich, Germany & Athens, Greece

Introduction

Aim of this study was to evaluate the impact of rhinoplasty on patients' every day quality of life, and compare our data to the norm-population..

Materials and Methods

A five-part questionnaire was sent to 164 patients, which underwent rhinoplasty. The indication-specific part of the five-part questionnaire contained the patients' demographic data, their pre- and post-operative status, as well as 23 pre-formulated items. Furthermore, the GBI questionnaire was used, evaluating the changes in patients' health conditions after a surgical procedure, the FLZM, which assesses the subjective quality of life, as well as the FPI-R and the RSES, as psychological personality tests. The last four questionnaires are standardized and exit data from the German speaking norm-population.

Results

90 Patients took part in the study with a median age of 40.26 years (22-65). 58% of the patients were operated due to aesthetic reasons, 8% due to restricted breathing and 26% due to both reasons. 60% of the patients felt more confident after the operation and 62% more attractive. In the 'General part' of the FLZM a significant improvement for item 'Partnership/Sexuality' could be shown, when compared to the norm-population data ($p=0,042$). There were no statistically significant differences in module 'Health'. The FPI-R showed an average score of 6,32 (scale 0 to 14), proving a normal/'healthy' emotionality and self-assessment. Finally RSES showed a median value of 33,63 (scale 10 to 40), which counts for a high self-confidence.

Conclusions

Our study showed, that not only a high level of patients' satisfaction with the operations' outcome could be achieved, but also an improvement of their quality of life, when our patients' data are compared to the norm-population data, They could feel postoperatively more attractive and self-confident and thus, when compared to the standard population data, their sexuality could be statistically significantly improved within their partnership.

16.13 INTRALESIONAL LASER TREATMENT (ILLT) FOR LIPS CORRECTION AFTER PERMANENT FILLER COMPLICATIONS

Giorgio DE SANTIS, Giulia BOSCAINI, Giovanna ZACCARIA – Modena, Italy

Introduction

Non resorbable substances are still injected to enhance soft tissue volumes and fill subcutaneous defects. This has been increasing the occurrence of granulomas reactions and disfiguring anaerobic infection, many of these are difficult to treat. Among the many complication of fillers, lips are very often involved. This study presents the outcome of intralesional laser treatment (ILLT) for evacuation of permanent filler material from the lips.

Materials & Methods

Two hundred sixty four patients (260 women, 4 men) with lips granulomas were treated at our Clinic from September 2006 to September 2014. An 808-nm diode (LASEmAR 800, EUFOTON srl, Trieste, Italy) was used at 6 to 8W with a pulse duration of 500 to 1,000 ms in an intralesional mode through a 200-mm optic microfiber. The fiber was introduced percutaneously into the granulomatous lesion (penetration depth 1?8mm) using the intralesional laser treatment (ILLT) procedure with subsequent evacuation of synthetic materials. In about 40 cases a mucosa resection has been added at an average of 6 months after the conclusion of the treatment. Presumed type of injected filler, time since onset of complications, type of lesion, number of treatments and outcome were collected.

Results

All patients tolerated the treatment sessions well and showed improvement, and they all expressed satisfaction after the laser treatment, reporting 175 patients reduction in pain, stiffness, tenderness, and size of the lesion and 89 complete resolution, the latter increasing with repeated treatments. The vast majority of complications were transient and due to the inflammatory response to the laser procedure and recurrent squeezing and these are swelling, hematoma with a residual minimal scarring.

Conclusions

Intralesional laser-assisted treatment offers a successful solution for patients who have been suffering from disfiguring lips nodules from injected permanent fillers.

16.21 FRACTIONAL CO2 LASER: FROM FACIAL TO VULVAR REJUVENATION

Luca NEGOSANTI, Rossella SGARZANI, Francesca NEGOSANTI,
Riccardo CIPRIANI – Bologna, Italy

Introduction

The CO2 laser has become, in the last 30 years, the gold standard treatment in dermatologic surgery for the treatment of a large number of skin and mucosal lesions. The introduction of the fractional microablative technology represented an integration to the ablative resurfacing technique, reducing the healing time and the side effects. In the last years many studies have been done on the application of CO2 laser treatment on the vaginal tissue.

Materials & Methods

We present a prospective observational single center study on 250 female patients in menopause affected by vulvar lichen sclerosus atrophicus. All the patients underwent 4 sessions of fractional microablative CO2 laser (at 5 weeks interval). All the patients were evaluated clinically and with a questionnaire before the treatment, 1 month after the first session and 12 months after the last one.

Results

The treatment is described as quite comfortable and painless by 78% patients. Clinically the treatment led to the recovery of a normotrophic mucosal surface in 85% of the patients. In the questionnaire all the symptoms related to vaginal atrophy were reduced (with a statistic significance) already after the first session, with further significant improvement after the last one.

Conclusions

Vaginal rejuvenation is a minimally invasive procedure, quick and painless, and have the effect to stimulate the internal tissues of the female genital to regenerate the mucosa improving tissue laxity and restoring the correct functionality.

16.29 FEMINIZING VAGINOPLASTY: AESTHETIC AND FUNCTIONAL MALE TO FEMALE GENITAL SURGERY

Isabella MAZZOLA, Cvetan TASKOV – Erding, Germany

Introduction

The technique in male to female surgery is largely standardized but refinements are essentials to achieve a good cosmetic outcome.

Construction of realistic labia minora presents more of a challenge to resemble those of natal women.

The aim of this paper is to report our experience of vaginoplasty in transsexual patients.

Materials & Methods

46 patients were treated in our department from 2012 to 2015 according to following technique. The inverted penile skin flap is used for vaginoplasty, whereas labia majora and minora are obtained by reshaping the scrotal skin. The glans provides a sensitive clitoris by employing neurovascular bundle technique. The corpus spongiosum posterior to the urethral meatus is excised, the urethra is shortened and sutured to the skin.

Postoperatively, the neovagina is held into position by a stent for five days in order to maintain form and depth. A questionnaire was developed to measure aesthetic outcome, sexual satisfaction and functionality.

Results

In 3 (6,5%) patients occur postoperative bleeding from the urethra which could be managed conservatively with haemostatic dressings.

2 (4,3%) patients showed skin loss of the neovagina and were retreated with a skin graft 3 weeks after vaginoplasty.

26 (56,5%) patients needed a revision surgery after 3 months for improving cosmetic outcome of the mons pubis, reduction of labia minora and clitoris, while the remaining 20 (43,4%) patients didn't need any refinements.

Conclusions

The current technique provides good rates of sensitivity and sexual satisfaction with one-stage vaginoplasty. Overall a balance between a neovagina with a good functionality and a realistic, cosmetic external appearance which resembles female anatomy is achieved.

16.37 REJUVENATION OF THE ARM THROUGH LIPOSUCTION AND FAT TRANSFER, AN INNOVATIVE NO SCAR BRACHIOPLASTY TECHNIQUE

Marwan ABBOUD, Saad DIBO – Brussels, Belgium

Introduction

Current brachioplasty techniques include excisional surgery alone or in combination with liposuction. The challenges of these techniques continue to include postoperative residual contour deformities, and scarring related complications. The authors propose a new classification and treatment algorithm for brachial deformities and describe their experience with a no scar brachioplasty technique by combined power assisted liposuction and lipofilling.

Material & Methods

95 patients with grade 1, 2 or 3 brachial ptosis who underwent brachioplasty alone or in combination with other procedures were evaluated in a prospective study. Preoperative markings divided the arm into 4 zones of treatment. The surgical technique combined power assisted arm liposuction of the posterior and paraxillary region, and power assisted lipofilling of the medial arm at the bicipital triangle.

Results

The mean age was 39 years (range, 19-58 years) and the mean body mass index was 28 kg/m² (range, 21-36 kg/m²). The mean arm liposuction volume was 240 ml (range, 0-450 ml per arm) and the mean fat injection volume per side was 110 ml (range, 0-220 ml). The mean operative time was 50 min (range, 45-60 min). The mean follow up period was 24 months (range, 12-48 months). Complications occurred only in patients undergoing brachioplasty in combination with another procedure and included hematoma (one abdominal and one thigh, 2.1 %).

Conclusions

Brachioplasty by combined power assisted arm liposuction and fat transfer is a safe and reliable option that circumvents the need for an excisional surgery in patients with mild to moderate brachial ptosis.

**16.49 COSMETIC IMPLANT TO FAT CONVERSION:
A 10 YEARS, 173 PATIENTS EXPERIENCE**

Roger KHOURI, Roger KHOURI Jr, Gino RIGOTTI, Kimberly KHOURI,
Daniel CALVA – Miami, USA

Introduction

Breast implants complications require replacements, pocket exchanges, and capsulectomies. These often compound scarring and worsen deformities. Implants stretch tissues while enhancing vascularity; once removed, the tissues left behind are ideal recipient sites for fat grafting. To augment the results of grafting the post-implanted breast, we present a novel addition; the Reverse-Abdominoplasty & Fat Transfer (RAFT) consists of inserting an intradermal purse-string suture along a line below the mammary folds and suspending the recruited crescent of inframammary tissue to the pectoralis fascia. This incisionless maneuver collapses the implant cavity, mushrooms out a larger breast mound and defines new mammary folds. We present our 9-year experience correcting implant-related problems with fat grafting.

Materials & Methods

Between 2005-2015, we performed 381 implant-to-fat conversions on 173 patients with cosmetic breast implant problems. Since 2011, we have incorporated the RAFT. while grafting the implant stretched and compressed tissue, we percutaneously release the restrictive vertical fibers in a mesh-like fashion to balloon them out while avoid creating cavities. We then inset a purse-string suture 2-5 cm distal to the mammary folds, and suspend the recruited tissue to the subclavicular fascia. This mushrooms up a larger breast mound with new mammary folds. Rigottomies then re-orient the fibers, relieve tension, and eliminate unwanted folds.

Results

The mean implant volume removed was 290 ml. Preoperative and 6-month postoperative MRI revealed a 400-ml and 250-ml augmentation with and without RAFT. RAFT recruited 70-200 ml of epigastric/lateral thoracic fat to each breast and sculpted pleasing natural breast folds. Patients with implants over 400 ml were unable to achieve central projection and required insertion of a small implant. There were no pathologic masses and 15% had benign cysts.

Conclusions

Lipografting + RAFT is a safe, effective and minimally-invasiv, method for implant-to-fat conversion that restores improves breast aesthetics while preserving near pre-implant volume.

17.01 BREAST BASE DIAMETER: DEFINING THE IDEAL AND HOW IT CHANGES WITH BREAST AUGMENTATION, AUGMENTATION-MASTOPEXY AND REDUCTION

Ewa MAJDAK-PAREDES, Elizabeth HALL-FINDLAY – Livingston, UK

Introduction

Breast base diameter (BD) defines horizontal limits of the individual's footprint. BD is an important landmark which will change with volume alterations. It would be prudent to know how it changes in order to improve outcomes and preoperative counselling. Our aim is to define the ideal BD and analyse the effects of volume reduction or addition procedures on its subsequent diameter which have not been previously studied.

Materials & Methods

340 breasts in 170 patients were studied. Prospectively maintained preoperative and postoperative footprint and breast measurements were included in the electronic database. Patients' demographics and breast implant data were extracted from medical records. Footprint and breast proportions with emphasis on BD were studied using medical photographs and electronic database.

Results

Ideal breast BD extends from moderate cleavage line medially to the anterior axillary line or slightly beyond it laterally. BD which fits with these characteristics ranged from 11-14cm (mean 12-12.5; BMI: 25) and was found in 90% of patients presenting for augmentation, 25% for reduction and 98% for augmentation-mastopexy. 10% patients presenting for augmentation had narrow BD (<11; mean 10.5; BMI: 20.5). 76% patients presenting for reduction had wide BD (>14; mean 16; BMI 28.5). In BD 11-14 group, postoperative BD increases by cm (5%) with augmentation and augmentation-mastopexy. It decreases by 0.5-1cm (5%) with reduction. In narrow BD group wider implant BD was chosen to improve footprint symmetry and was found to determine the postoperative BD. In wide BD group, reduction reduced the postoperative BD to the ideal (by 2cm; 10%). Other pre- and postoperative footprint and breast landmarks were also studied in detail.

Conclusions

Ideal BD can be defined and ranges from 11 to 14cm. It can predictably change postoperatively with volume addition or reduction procedures. Selection of wider implant BD in narrow BD patients determines the final postoperative BD. Vertical breast reduction can achieve ideal BD in wide BD patients.

17.09 THE DOUBLE-BUBBLE AND BOTTOMING OUT DEFORMITIES IN BREAST AUGMENTATION: A CRITICAL REAPPRAISAL OF THE INFRAMAMMARY FOLD-APPLIED ANATOMY AND ITS SURGICAL IMPLICATIONS

Marzia SALGARELLO, Giuseppe VISCONTI – Rome, Italy

Introduction

Double-bubble and bottoming-out deformities are two distinct inferior implant malposition complications, both related to inferior pole dissection and, particularly, to inframammary fold (IMF) lowering.

In this paper we report our findings in breast cadaveric dissection focusing on the IMF applied-anatomy and we critically review our last 5-year experience in breast augmentation, with particular focus on technical tips to prevent these deformities.

Materials & Methods

We performed breast dissection on 4 consecutive embalmed female cadavers. We reviewed the charts of patients operated for breast augmentation from November 2009 to December 2014, totaling 103 patients. All patients underwent breast augmentation via periareolar incision by using dual-plane type 1 technique. After the Pectoralis Major (PM) muscle was transected at the inferior pole, the pocket dissection and IMF lowering procedure were carried out by changing the dissection route to a more superficial plane to respect the IMF anatomy.

Results

All cadaveric dissections resulted in constant findings. The Superficial Pectoralis Fascia (SPF) is located on the outer side of the PM. SPF shows a peculiar fan-shaped structure at the IMF made of a superior wing which goes superficially toward the skin and an inferior wing fusing with the 5th rib periosteum and vanishing over the rectus abdominis sheath. On a total of 103 patients, we experienced only one case of double-bubble deformity and no bottoming out.

Conclusions

IMF is a complex osseo-fascio-cutaneous structure where SPF represents a key structure in terms of clinical translation in breast augmentation surgery. Hence, a critical analysis of IMF relationship with surrounding breast structures helps to understand the etiology of double-bubble and bottoming out deformities and gives the anatomical basis to prevent them.

A wrong dissection route in inferior pocket dissection/IMF lowering procedure may favor the development of double-bubble or bottoming out deformities.

17.21 DOES IMPLANT POCKET AFFECT AESTHETIC AGEING OF AUGMENTED BREASTS?

Beatriz BERENGUER, Teresa GARCIA – Madrid, Spain

Introduction

Breast implants have been used for reconstructive and aesthetic purposes for more than 5 decades, however, controversy persists regarding incision, implant type and implant pocket. Several high evidence studies have correlated these variables with different complication rates such as capsular contracture and malposition. In this study, we analyzed the effect of implant pocket on long term aesthetic outcome in non complicated breast augmentations. We hypothesized that subfacial augmentations would age worse than subpectoral ones.

Materials & Methods

This is a retrospective cohort study stratified by subfacial and subpectoral implant pocket. We reviewed all augmentations performed over the past 15 years, by 2 experienced surgeons using the same technique (submammary incision, dissection under direct vision with cold light, suction drains). To reduce bias, we included 'good' candidates: normal BMI, superior pinch > 2cm, and excluded patients with ptosis, secondary or reconstructive augmentations and those that experienced complications. For the same purpose we only included round textured implants between 250cc and 350cc in size. Aesthetic ageing was assessed comparing, pre and postoperative measurements at 1, 5 and 10 years (yugulum-nipple and areola-submammary fold), and by subjective evaluation of the patients using a 4 point scale. Chi square and Fisher tests were used to study possible correlation with outcome.

Results

828 prosthesis in 414 patients were included in the study period, aged 18-56 years and a mean BMI of 22,3 KG/m². No significant differences were found among the measured distances between the 2 groups. Although there was a tendency towards higher subjective palpability of the implant in the subfacial group, no significant differences were found in general subjective satisfaction.

Conclusions

Long term aesthetic outcome in 'good' augmentation candidates with round, textured, moderate size implants in the subfacial and subpectoral plane is similarly satisfactory.

**17.29 MANAGEMENT OF A TUBEROUS BREAST
DEFORMITY: CRITICAL REVIEW OF LONG-TERM
OUTCOMES AND PATIENTS' SATISFACTION**

Stefania TENNA, Barbara CAGLI, Beniamino BRUNETTI, Mauro BARONE,
Paolo PERSICHETTI – Rome, Italy

Introduction

The surgical strategy for the treatment of a tuberous breast deformity has dramatically changed over the years due to the introduction of a large variety of autologous and implant based procedures. However, a long-lasting and aesthetic breast contour is an ongoing challenge, and re-interventions are common. The aim of this study was to evaluate the long-term results of tuberous breast corrections, focusing on the incidence of multi-stage procedures, and patient satisfaction.

Materials and Methods

All patients who underwent correction of a tuberous breast deformity between 2000 and 2012 have been considered for this retrospective analysis. Age, degree of deformity, degree of asymmetry, BMI, pregnancy, first surgical technique used, occurrence of complications, number of operations, and surgical technique for further procedures were registered. Statistical analysis to identify predicting factors for re-interventions was performed with the chi square test. Patient satisfaction was evaluated with BREAST-Q.

Results

A total of 88 tuberous breast corrections were performed on 46 patients (4 unilateral). The degree of malformation was, according to Grolleau, mostly grade III (57 %) and grade A asymmetry (61 %). A total of 57 breasts (64.7 %) first underwent implant based corrections, 31 (35.3 %) underwent autologous corrections; in 11 breasts an implant based correction was then converted into an autologous corrections. The mean number of procedures was 1.95 (range: 1-5). In 22 patients (47.8%) re-interventions were due to complications: mainly implant rupture (22.8%), and volume asymmetry (10.2%). Statistics confirmed a correlation between re-interventions and implant based technique, and age. BREAST-Q showed higher satisfaction in the group with implants.

Conclusions

For a good cosmetic result, an ear lobe split deformity is best repaired by incorporating a Z-plasty to disguise the scar, but advice on the choice of future jewellery is essential to prevent recurrence. Ear reduction is a useful operation not widely practiced. Tips and tricks are presented.

