

# 32ND EURAPS ANNUAL MEETING

26-28 MAY 2022 - NAPLES, ITALY

## ABSTRACT BOOK



# SESSION 1

# RESEARCH



**Abstract No.: 81**

**Category:** Research

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Mimicking the breast microenvironment to investigate the interaction between Adipose Derived Stem Cells (ADSCs) and ER+ breast cancer cell lines (MCF-7 & T47D): Implications for the safety of fat grafting.

**Introduction:**

Contemporary scientific studies demonstrate that adipose derived stem cells (ADSCs) confer a malignant advantage when co-located with breast cancer, via cytokine release and direct cell-to-cell interaction which propagates metastatic growth and progression. Previous studies use ADSCs derived from healthy patients, which lack key characteristics of ADSCs seen in patients with breast cancer undergoing fat grafting. This study aims to examine, for the first time in the literature, the indirect and direct effect of ADSCs isolated from healthy and cancer patients on the key cancer hallmarks of two ER+ breast cancer lines (MCF-7 & T47D).

**Materials and Methods:**

ADSCs harvested from patients with and without breast cancer (n=16) were isolated and fully characterised. Indirect (conditioned media) and direct (3D non-contact co-culture) models were used to examine the effect these patient groups had on proliferation and adhesion (iCELLigence), migration (iBIDI inserts), invasion (collagen membranes), protein expression (ELISA) and bioenergetics (Seahorse XFe) of MCF-7 and T47D cell lines.

**Results:**

There was a statistically significant increase ( $p<0.005$ ) in key cancer hallmarks (proliferation, migration and invasion) in conditioned media (n=16) and co-culture (n=12) models for both MCF-7 and T47D cell lines seen with ADSCs derived from healthy patients (SEM/2-SD). Significant changes in protein expression (IL-6, VEG-f & MCP-1) were also noted along with the Seahorse bioenergetic profiles following co-culture. These changes were not reflected in the assays involving ADSCs isolated from patients with cancer, demonstrating the impact of ADSC source on the cancer microenvironment, demonstrating key behavioural changes in the different ADSC populations.

**Conclusions:**

This unique study illustrates key differences in the interaction of ER+ Breast Cancer and ADSCs isolated from two distinct patient populations. Further work is required to establish the wider impact and better understand the implications for the safety of fat grafting within the breast cancer microenvironment.

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**Abstract No.: 30**

**Category:** Research

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Cathelicidin LL-37 expression in human breast implant capsules

### **Introduction:**

Capsular contracture is the most common complication following breast implant placement. It was shown to have a multifactorial pathogenic process. Cathelicidin LL-37 is a cationic peptide involved in innate immunity. Although initially investigated for its antimicrobial role, it was found to have pleiotropic activities, such as immunomodulation, angiogenesis stimulation and tissue healing. The aim of the study was to investigate the expression and localization of Cathelicidin LL-37 in human breast implant capsules and its relationship with capsular formation, remodeling and clinical outcomes.

### **Materials and Methods:**

The study enrolled 28 women (29 implants) who underwent expander substitution with definitive implant. Contracture severity was evaluated according to Baker's classification. Specimens were stained with hematoxylin/eosin, Masson trichrome, immunohistochemistry and immunofluorescence for Cathelicidin LL-37, CD68, alpha-smooth muscle actin, Collagen type I and III, CD31 (as a marker of neo-angiogenesis) and TLR-4. Inflammatory infiltration and capsular thickness were quantified and analyzed.

### **Results:**

Cathelicidin LL-37 was expressed in macrophages and myofibroblasts of capsular tissue in 10 (34%) and 9 (31%) of the specimens, respectively. In 8 cases (27.5%) it was expressed by both macrophages and myofibroblasts of the same specimen. In infected capsules, expression by both myofibroblasts and macrophages was found in all (100%) specimens. LL-37 expression by myofibroblasts positively correlated with its expression by macrophages ( $p <0.001$ ). Moreover, the Cathelicidin LL-37 expression by macrophages of peri-expander capsules negatively correlated with the severity of capsular contracture on definitive implants ( $p <0.005$ ).

### **Conclusions:**

This study demonstrates the possible expression of Cathelicidin LL-37 in macrophages and myofibroblasts of capsular tissue and its negative correlation with the severity of capsular contracture following permanent implant placement. Expression or up-regulation of LL-37 may be involved in myofibroblast and macrophages modulation, thus playing a role in the pathogenic fibrotic process underlying capsular contracture.

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**Abstract No.: 28**

**Category:** Research

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Dermal Nipple-Areolar Complex Perfusion through Full Thickness Circumareolar Scars in Two-Stage Nipple Sparing Mastectomy: Is Nipple-Areolar Complex delay in a porcine model time-dependent ?

**Introduction:**

In large breasts, many surgeons remain reluctant to perform nipple-sparing mastectomy (NSM) due to higher risk of nipple-areola-complex (NAC) necrosis. Several authors propose delayed procedures, allowing enhanced blood supply in multiple stages. The incidence of NAC necrosis in one-stage versus delayed reconstructions is high. The purpose of this study is to show an acceptable therapeutic interval to obtain adequate NAC perfusion by staged delay.

**Materials and Methods:**

Two-staged NSM is simulated in 75 (25/25/25) NAC with a 4/6/8 weeks interval in 12 Aachener mini pigs . The NAC undergo a full thickness circumareolar incision onto the muscular fascia with preservation of the glandular perforators. In the second stage NSM is performed with the introduction of a silicone sheet to prevent vascularization by wound bed imbibition. Digital videography is used to assess necrosis and capillary refill. Near-infrared fluorescence images with indocyanine green (ICG) are taken at five time points: before and immediately after first stage, before and immediately (4/6/8 weeks) after, and 10 days after second stage. Custom software (Elevision IR platform-Medtronic) is used to assess perfusion and perfusion patterns.

**Results:**

No NAC necrosis is seen after 4 or 6 versus 8 weeks delay.. Statistically the risk difference between 4 (respectively 6) and 8 weeks is zero, with CI (-0.08 - 0.08) which is within the preset noninferiority margin of 0.1. ICG-fluorescence-images show complete alteration of NAC perfusion pattern from V1 (subjacent gland) to V4 pattern (capillary fill following devascularization exhibiting a predominant arteriolar capillary blush without distinct larger vessels) in all NAC.

**Conclusions:**

NAC delay reverses glandular NAC perfusion to dermal transicatricial neovascularization. Neovascularization through circumareolar full thickness scars provides sufficient dermal NAC perfusion without necrosis after 4 weeks delay. This staged technique could broaden NSM indications in difficult human breasts. Large clinical trials are necessary to provide identical results in human breasts.

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**Abstract No.:** 155

**Category:** Research

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Ex-vivo machine thrombolysis reduces re-thrombosis rates in salvaged thrombosed myocutaneous flaps in swine

**Introduction:**

Microsurgical reconstruction knows a risk for thrombotic complications (2-5%). Current thrombolytic therapy has a salvage rate between 60% and 70%, but is afflicted by bleeding complications (2-6%). The use of machine perfusion for delivering thrombolytic agents is a new method that could potentially reduce these complications. This article compared flap salvage outcomes comparing machine thrombolysis versus a manual flush with tissue plasminogen activator (t-PA).

**Materials and Methods:**

Sixteen bilateral flaps (12 x 9 cm) were dissected from eight female Dutch Landrace pigs (70 kg). Thrombosis was induced in free rectus abdominis flaps by clamping the pedicle's veins for two hours. Flaps were either thrombolysed with 2 mg t-PA (1 mg/mL) during two hours of machine perfusion (perfusion group; n=8) or intra-arterially injected (manual group; n=8) before replantation. Near-infrared fluorescence angiography was used to confirm thrombus formation and to assess tissue perfusion; muscle biopsies were analyzed for ischemia/reperfusion injury directly after thrombolysis and 15 hours after replantation.

**Results:**

Higher incidence of secondary thrombosis was seen in the manual group compared to the perfusion group (n=6 vs n=0, respectively; p<0.001), resulting in two complete flap failures. Fifteen hours after replantation, mean fluorescence intensities were 13.0 (CI 10.1, 15.8) and 24.6 (CI 22.0, 27.2) in the perfusion and manual group respectively (p<0.001) and mean muscle injury scores were comparable, measuring 7.5 (SD 1.5).

**Conclusions:**

Two hours of machine thrombolysis of compromised flaps in a porcine model showed higher salvage rates compared to a manual injection with t-PA and reduced the incidence of secondary thrombosis.

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**Abstract No.: 49**

**Category:** Research

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** A New Murine Model To Investigate Peripheral Nerve Regeneration - the Murphy Roths Large Strain

**Introduction:**

Outcomes of peripheral nerve injury (PNI) remain to be largely unchanged for decades. PNI disproportionately affects young and healthy adults and represents a major cause of morbidity in hand trauma. Recently described, scar formation following PNI poses a physical barrier to axonal regeneration. Murphy Roths Large (MRL/MpJ), known as “super-healing” mice, have shown the ability to heal with minimal or no scar formation in wound and tendon healing. This study seeks to investigate whether this attribute improves peripheral nerve regeneration.

**Materials and Methods:**

The MRL/MpJ was compared to the C57BL/6J strain (controls). 120 mice were divided into two groups: 1) Nerve Repair (NR, n=60) and 2) Nerve Graft (NG, n=60). The right sciatic nerve (SN) was either divided and microsurgically repaired (NR) or, had a 5mm segment excised, reversed and re-interposed (NG). Functional recovery was assessed by the Sciatic Functional Index (SFI) at post-operative weeks (POW) 1, 3, 6, 9, and 12. SNs were subsequently harvested and processed to calculate axon counts and the ‘g’ ratio for each end-point.

**Results:**

The MRL/MpJ strain demonstrated significantly superior SFI scores at POW 1, 3 (NR group) and at POW 6 (NG group). Axon counts were significantly higher in the C57BL/6J strain at POW 3 and 6 (NR group), and at POW 6, 9, and 12 (NG group). The MRL/MpJ strain demonstrated a significantly better axonal myelination at POW 3, 6, 9, and 12 (DR group) and at POW 6 and 12 (NG group).

**Conclusions:**

This study demonstrates superior axonal regeneration in the MRL/MpJ strain. The results support the concept of quality being more important than the quantity of regenerating axons following peripheral nerve injury. More future work implementing a mechanistic that targets nerve scarring is warranted using the MRL/MpJ strain.

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**Abstract No.:** 288

**Category:** Research

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Proprioceptive feedback restoration via a novel nerve transfer to a target muscle for natural prosthetic control

**Introduction:**

Trauma to the upper limb results in drastic impairment of quality of life. New therapeutic concepts utilizing bionic reconstruction have advanced to an established option. Nevertheless, recovery of sensory feedback in bionic reconstruction still presents a great obstacle, which is often reported by patients as a disturbing problem. The functional outcome and the prosthesis embodiment are often insufficient, leading to artificial movement patterns and prosthesis abandonment. Interestingly, the potential implementation of proprioceptive feedback in the bionic reconstruction of the upper extremity is still poorly explored.

**Materials and Methods:**

In a rat model, the sternomastoid muscle was used as a target muscle for proprioceptive reinnervation. The ulnar nerve was transected distal to the dorsal and palmar branches and tunneled under the ipsilateral major pectoral muscle to spare adjacent structures. Coaptation is done epimysial using two interrupted sutures at the motor entry point of the sternomastoid muscle (n=30). As a control, the ipsilateral marginal mandibular branch of the facial nerve is used in a similar manner (n=30). Twelve weeks after the surgery, whole-mount staining, intramuscular retrograde labeling, and triple immunofluorescent muscle-fiber staining were used to show morphological and functional alterations. The functional assessment was performed using ENG and EMG measurements.

**Results:**

The surgical feasibility of the novel nerve transfers has been proven. No adverse events related to the surgical procedure were observed, all animals tolerated the procedure well. The motor reinnervation in the ulnar nerve transfer group has been shown in the CNS as well as within the muscle. Muscle fiber switch was observed in both groups. The electrophysiological assessment showed successful motor reinnervation in both groups.

**Conclusions:**

We demonstrated a feasible new nerve transfer in an animal model. The findings provide multi-level evidence of proprioceptive reinnervation after a nerve transfer for their implementation into the sensory feedback for bionic prosthetics.

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**Abstract No.: 101**

**Category:** Research

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Multimodal imaging and deep learning volumetry enable structural and functional assessment of muscle regeneration following peripheral nerve injury - a proof of principle in rats.

**Introduction:**

Neuromuscular injuries with altered muscle innervation lead to dramatic changes in muscle structure and function. The subsequent muscle atrophy is characterised by decreased muscle volume and metabolic disbalance. Currently, clinical assessment of muscle regeneration using physical examination and electromyography is limited in early differentiation between atrophy and incipient regeneration. The aim of this study is to investigate dynamic muscle volume and glucose metabolism as functional markers of peripheral nerve regeneration over time.

**Materials and Methods:**

In a biomedical study, the measurement protocol of  $\mu$ -computed tomography (CT) and positron emission tomography (PET) using fluorodeoxyglucose were established using healthy Sprague-Dawley rats. Threshold-based segmentations of 20 hind limbs each were used for manual volumetry. Using this data, a deep-learning algorithm was trained for semi-automated volumetry. In the second phase, 12 Sprague-Dawley rats were subjected to peroneal nerve damage. They were examined weekly by PET-CT and gait analysis. After four weeks, the animals with contusion damage and after 8 weeks, the animals with transection damage underwent final imaging. After euthanasia, organ removal for radiotracer biodistribution, ex-vivo volumetry and histology were performed.

**Results:**

While healthy muscle is active mainly during force production, de- or reinnervated muscle shows increased metabolism even at rest. In addition, glucose metabolism changes due to the switch from slow to fast fibre types during muscle denervation. Muscle denervation initially showed denervation oedema accompanied by increased glucose metabolism, followed by muscle atrophy. Eventual reinnervation leads to an increased protein synthesis and thus to a renewed increase in volume.

**Conclusions:**

The volumetric measurement and the semi-automatic algorithm could be directly transferred into clinical. Longitudinal volumetry and subsequent determination of the muscle's regeneration status could improve diagnostic accuracy. Early detection of irreversible atrophy or signs of muscle regeneration before first clinical signs, could facilitate the decision on the type of reconstructive surgery and allow early treatment measures.

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**Abstract No.: 77**

**Category:** Research

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Nanocellulose composite bioinks for 3D bioprinting facial cartilage

### **Introduction:**

3D bioprinting technology holds exciting promise for reconstructive surgery. Our preliminary work has shown Nanocellulose (NC) bioinks have promising biological and mechanical properties for 3D bioprinting. The aim of this project was to optimise the nanocellulose material and blend it with hyaluronic acid (HA) for 3D bioprinting facial cartilage and elucidate its printability, biocompatibility and chondrogenicity.

### **Materials and Methods:**

Nanocellulose blend (NCB), crystal (NCC) and fibril (NCF) formulations were compared for printability and chondrogenicity profiles and blended with a 30mg/ml HA hydrogel. NC and HA were blended to make composite NC-HA bioinks ranging from 100% HA to 20% HA, with NC-alginate as a control. Human nasoseptal chondrocytes from at least 3 separate patients were cultured in the biomaterial, crosslinked with 5 $\mu$ M hydrogen peroxide, for 21 days. Chondrogenicity was determined with PCR, quantitative protein assays and histology. Printability was assessed using an AR-G2 Controlled Stress Rheometer and CELLINK bioprinter. Biocompatibility was demonstrated with Live-Dead, lactate dehydrogenase and AlamarBlue assays.

### **Results:**

All NC materials demonstrated superior printability and biocompatibility to alginate, with NCC and NCB offering superior biological properties. Instant crosslinking of NCHA was achievable at concentrations of 5 $\mu$ M hydrogen peroxide with no detriment to cell survival. NCHA was noted to be up to 10-fold more chondrogenic ( $p<0.0001$ ) than NC-Alginate and HA alone ( $p<0.0001$ ). Histologically, NCHA demonstrated more intensely stained extracellular matrix than NC-Alginate and HA. Of the NCHA mixtures, 40%HA -60%NC ( $p=0.0001$ ) was the most chondrogenic blend. All nanocellulose hydrogels demonstrated appropriate mechanical properties for 3D printing and retained their shape as auricular and tracheal components. Cell viability and proliferation was sustained over 21 days.

### **Conclusions:**

NCHA bioinks demonstrate superior chondrogenicity, favourable mechanical properties and excellent biocompatibility for bioprinting cartilage for reconstructive surgery. These inks hold promise for in vivo testing and eventually clinical translation.

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**Abstract No.:** 142

**Category:** Research

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** “On Demand” immunosuppression: a local, tacrolimus-loaded drug delivery system prolongs graft survival in Vascularized Composite Allotransplantation in a large animal model.

**Introduction:**

Although vascularized composite allotransplantation (VCA) has rapidly evolved as the ultimate method to restore complex tissue loss, there has been slow progress in the development of immunosuppression regimens with reduced off-target effects. Via direct administration of an on-demand tacrolimus drug delivery system (DDS) into the graft, we aim to prolong graft survival.

**Materials and Methods:**

MHC-mismatched, outbred pigs underwent an osteomyocutaneous flap allotransplantation as a representative model of VCA. Next, animals were left untreated (group 1), received a one-time intra-graft injection of a tacrolimus-loaded DDS (group 2) or every 30 days (group 3). All animals were monitored at regular intervals until grade III rejection or post-operative day (POD) 90. Tissue and blood samples were collected at defined time points to evaluate intra-graft drug distribution and markers of off-target toxicity.

**Results:**

Untreated pigs (n=4) reached grade III rejection within 8 days as expected. In contrast, pigs from group 2 (n=4) had a median graft survival time of 45 days (34-60 days). By performing multiple injections, all pigs in group 3 (n=4) reached POD90. Evaluation of tissue levels showed higher intra-graft tissue levels of tacrolimus compared to contralateral side. Markers of kidney and liver function showed no relevant alteration in group 2 while pigs from group 3 had a minor elevation of creatinine. However, no effect on liver biomarkers was observed.

**Conclusions:**

Our preliminary results suggest that a one-time injection of a tacrolimus-loaded DDS is able to prolong graft survival in a clinically representative porcine model of VCA. Interestingly, when reinjection was performed, grafts survived until endpoint, suggesting that local use of a tacrolimus-loaded DDS might be an attractive option also for clinical use.

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**Abstract No.: 63**

**Category:** Research

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Smart hydrogels with Spheroids of Adipose stem cells for minimally invasive bone and cartilage regeneration

**Introduction:**

In-situ gelling biocompatible polymers laden with stem cells can be very useful for minimally invasive tissue regeneration. They can avoid uncontrolled cell spreading and poor integration with the surrounding tissue. Adipose stem cells (ASCs) represent a great promise for tissue regeneration. When they are cultured in specific conditions, they form three-dimensional spheroids (S-ASCs). They express mesenchymal stem cell markers and display enhanced ability to differentiate towards MSCs lineages.

**Materials and Methods:**

S-ASCs were obtained from liposuction of healthy patients. They were cultured in stem cell medium (SCM) or mesenchymal differentiation media (osteoblastic, ODM, and chondroblastic, CDM). Physicochemical, morphological and mechanical properties of partially degalactosylated xyloglucan (dXG) hydrogels and k-Carrageenan/Polyvinyl-alcohol (k-C/PVA) systems were defined. S-ASCs compatibility with hydrogels was evaluated by viability test, mesenchymal differentiation abilities and gene analysis. The practical printability of the formulations was also tested using the ROKIT Invivo printer.

**Results:**

SASCs were uniformly distributed on the surface but also through the thickness of the hydrogel. The cell viability was preserved in SCM both in dXG and k-C/PVA systems. It increased of 3fold in ODM and 10fold in CDM in dXG1 and 5fold in k-C2/PVA4 system. The gene analysis demonstrated the maintenance of stemness and the ability to differentiate of SASCs in dXG. The feasibility of injection of SASCs-laden formulations was verified. The k-C2/PVA4 system was printed and proposed as an ideal bio-ink for 3D bioprinting processes.

**Conclusions:**

The incorporation of SASCs into injectable hydrogels was an effective methodology to grant SASCs viability and preserve their stemness. As well as, the forming hydrogel promote SASC differentiation in osteogenic or chondrogenic cells. Our study also explores the suitability of k-C/PVA systems for the 3D printing. These formulations are very promising for the repair of both cartilage and bone defects, that are still a challenge for modern medicine.

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**Abstract No.:** 140

**Category:** Research

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Photobiomodulation with polychromatic light (600-1200 nm) improves fat graft survival by increasing adipocyte viability, neovascularization, and reducing inflammation in a rat model

**Introduction:**

Unpredictability with the final volume and viability of the graft are the major concerns in fat grafting. An experimental study was conducted to increase graft retention using photobiomodulation (PBM) with polychromatic light in near-infrared region (600-1200 nm) by utilizing its stimulatory effects on angiogenesis, neovascularization, adipocyte viability, and anti-inflammatory properties.

**Materials and Methods:**

A total of 24 rats were divided into four groups ( $n = 6$ ) according to the applied polychromatic light protocol to the recipient site (none, before fat transfer, after fat transfer, and combined). In all groups, inguinal fat pad was excised, measured for volume and weight, and transferred to the dorsum of the rat. At the end of the experiment, fat grafts were harvested from the recipient site for volume and weight measurements, histological, and immunohistochemical evaluation.

**Results:**

Intergroup comparison revealed that fat graft retention regarding weight and volume, was significantly superior in Group IV ( $p = 0.049$  and  $p = 0.043$ , respectively), which polychromatic light was applied both before and after transfer of the graft. Hematoxylin-eosin and Masson's trichrome stained sections showed absence of necrosis, fibrosis, inflammation, cyst formation, and increased vascularization of both inner and outer zones of the grafts in Group IV. Also, immunohistochemical staining scores for perilipin (indicator for adipocyte viability), CD31 and VEGF (indicators for angiogenesis and neovascularization) were significantly higher ( $p < 0.001$ ). Ki67 scores were significantly lower in this group because of anti-inflammatory environment ( $p < 0.001$ ).

**Conclusions:**

Application of PBM to the recipient site before and after fat transfer improved outcomes in rats at 56 day after fat grafting by means of volume retention, increased neovascularization and adipocyte viability and reduced necrosis, fibrosis and inflammation.

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# SESSION 2

# MICROSURGERY



**Abstract No.:** 220

**Category:** Microsurgery

**Time:** 4

**CR:** Yes

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Successful Transplantation of a latissimus dorsi flap after nearly 6 hours of extracorporeal perfusion: A case report

**Introduction:**

Prolonged ischemia of tissue inevitably leads to their necrosis. This is especially relevant in the case of transplantation or replantation. In such situations, reperfusion in a timely manner might not be possible due to transportation times or other unforeseen complications. Therefore, a readily available and simple method to oxygenate the tissue and thus widen the time frame to reperfusion seems desirable.

**Case Report:**

Here, we present a case of extracorporeal perfusion of a latissimus dorsi (LD) flap that was successfully transplanted after nearly 6 hour of ischemia. A 41-year-old patient suffered multiple injuries including complete severance of the popliteal artery requiring emergency bypass. After stabilization of the patient and subsequent debridement, a LD flap was performed for soft tissue coverage. However, there was an acute occlusion of the bypass during flap inset. To salvage the free flap, a one-way extracorporeal perfusion of the flap with heparinized isotonic saline solution was performed for a total of 5 hr and 47 min. The flap survived with minimal tip necrosis.

**Conclusions:**

Skeletal muscle suffers irreversible damage after approximately 3 hours of ischemia which results in total necrosis after around 6 hours. This case report describes the application of a simple extracorporeal perfusion technique for salvage of a free flap over a prolonged ischemia time. Due to its ease and quickness of application as well as ubiquitous availability, it might serve as a valuable tool in cases of acute problems with the recipient vessels or other incidents where several hours of ischemia time are to be anticipated.

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**Abstract No.:** 122

**Category:** Microsurgery

**Time:** 4

**CR:** Yes

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Abdominal wall reconstruction with the free functional Kiss Latissimus Dorsi (LD) Flap

#### **Introduction:**

Extensive defects of the abdominal wall are nowadays addressed with soft tissue flaps and synthetic or biological meshes. At date, there is no clear consensus in literature about the additional value of dynamic abdominal wall reconstruction with neurotized functional flaps. The “Kiss” flap concept was described by Zhang to increase the surface area of skin flap coverage while minimizing donor site morbidity. At date, the free Kiss LD Flap has never been applied to abdominal wall reconstruction and its neurotization has never been documented in literature.

The authors describe a unique case of total abdominal wall reconstruction with the free functional kiss LD flap.

#### **Case Report:**

A 65 years old patient affected by dermatofibrosarcoma protuberans of the abdominal wall underwent resection, which left her with a 23 x 15 cm full-thickness defect of the abdominal wall. After placing a synthetic mesh, a myo-cutaneous LD Flap with Kiss configuration was planned to maximize the amount of harvestable skin and reduce donor site morbidity. End-to-end anastomosis between right deep inferior epigastric and thoracodorsal vessels was performed, together with thoracodorsal nerve coaptation to a sizeable intercostal nerve. The two skin islands kissed each other in the left supero-lateral aspect of the defect, obtaining an almost complete skin resurfacing of the abdominal wall. Donor site was closed primarily. Post-operative course was uneventful. Good abdominal contour was observed 3 months postoperatively, with adequate abdominal tone at rest in laying and standing position. One year postoperatively, muscle neurotization was confirmed with clinical examination and the patient reported very high functional outcomes at the HerQles questionnaire.

#### **Conclusions:**

The free Kiss LD flap represents a reliable solution to reconstruct extensive full thickness defect of the abdominal wall while reducing donor site morbidity. Flap neurotization should be attempted whenever possible to improve the functional outcomes of the procedure.

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**Abstract No.: 149**

**Category: Microsurgery**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** The osteocutaneous SCIP-Flap: a reliable technique for orthoplastic reconstruction in the European population

**Introduction:**

Pioneered mainly by Asian units the superficial circumflex iliac perforator (SCIP) flap is increasingly gaining acceptance also in western centers, primarily due to its low donor site morbidity and customizability in thickness from bulky to superthin. Yet, the traditional SCIP-flap can further be adapted to incorporate a variety of additional tissues (bone, muscle, nerve, fascia, vascularized lymph nodes) and therefore can be tailored to fit a wide variety of different reconstructive needs, also in orthoplastic surgery.

**Materials and Methods:**

We performed a single center, retrospective chart review of all cases in which osteocutaneous SCIP-flaps were used. We describe the relevant anatomy, our surgical technique and present the surgical, functional as well as aesthetic outcomes of the patients in our series.

**Results:**

Since 2019, we have successfully used osteocutaneous SCIP-flaps in 6 patients, 5 in the extremities and 1 for the head and neck region. Indications entailed both traumatic and oncological cases. The vascularized iliac crest was used to reconstruct defects of the hand (metacarpal), tibia, foot (calcaneus, metatarsal) and facial bones (maxillary sinus). One flap underwent a successful emergency revision due to venous congestion. All flaps survived and there were no donor site complications. Long-term follow-up shows adequate bony integration and satisfactory soft tissue coverage with good functional restoration and minimal donor site morbidity.

**Conclusions:**

Our experience shows that the osteocutaneous SCIP-flap is a reliable and versatile microsurgical technique for combined soft tissue and bone reconstructions in a European center, being ideally suited for cases where thin soft tissue coverage is needed in addition to small to moderately sized vascularized bone.

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**Abstract No.: 42**

**Category: Microsurgery**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Feasibility of a new robotic microsurgical system for lymphatic and reconstructive surgery

**Introduction:**

Robotic microsurgery has emerged as a new technology with potential benefits for reconstructive surgery. Further development may advance the field by allowing for microsurgical reconstructions in otherwise hard to reach areas. Therefore it was the aim of the study to investigate the feasibility of the Symani® Surgical System to perform super/microsurgical anastomoses in our unit.

**Materials and Methods:**

We report a first case series using the Symani® to perform lympho-venous and arterial anastomoses in lymphatic and reconstructive surgery. The system consists of two robotic arms that can be positioned to facilitate microsurgical procedures. It is combined with a console, that is composed of an ergonomic chair, a footswitch controller and forceps-like joysticks. Motion scaling was set to 10x. Visualization was either achieved with a 3D system or an optical microscope.

**Results:**

In the first ten cases of lympho-venous all anastomoses were patent as confirmed by ICG flow. Despite a longer time to perform the first anastomoses with the robot, we observed a decline in duration. Among the advantages of the system were a high accuracy in placing the stitches even in very small and fragile vessels or when performing anastomoses with size mismatches. The challenges encountered included the lack of a touch sensation and the necessity to develop a “see-feel”. During further introduction of the system into the clinics arterial anastomoses for free flap reconstruction were performed in addition showing good patency.

**Conclusions:**

Robot-assisted surgery may open up new frontiers in reconstructive microsurgery, e.g. reliable anastomoses on even smaller blood vessels (e.g. smaller perforator free flaps) and lymphatic vessels or on structures that lie deeper in the body cavities. Larger patient cohorts, longer investigation periods and inclusion of surgeons at different training levels will be necessary to further study the potential of robotics in microsurgery.

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**Abstract No.: 250**

**Category: Microsurgery**

**Time: 8**

**CR: No**

**Event : 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022**

**Title : Intraoperative Vasopressor Usage in Free Tissue Transfer: Should We Be Worried?**

**Introduction:**

The role of vasopressors has long been a subject of debate in microsurgery. Conventional wisdom dictates the avoidance of vasopressor use, due to concerns such as peripheral vasoconstriction, inducing vasospasm of the anastomoses and leading to failure in perfusion. It has since become common practice in some centres of the UK to avoid intraoperative vasopressor use during free tissue transfer surgery. Recent studies have suggested that this traditional view may not be supported by clinical evidence. However, none of these studies have separated vasopressor use by method of administration.

**Materials and Methods:**

We conducted a retrospective review over an 8 year period of our experience of vasopressor use in free flap surgery at a single high-volume centre, using the departmental free flap database, anaesthetic records and patient case notes. We also looked at the method of administration of vasopressor where relevant. The outcome measures were flap failure, flap-related complications and overall postoperative complications (reported using the Clavien-Dindo classification). Groups were compared using Chi-square or Fisher's Exact test where appropriate.

**Results:**

A total of 777 flaps in 717 patients were identified. 59.1% of these had vasopressors administered intraoperatively. The overall failure rate was 2.2%, with 9.8% experienced flap-related complications. There was no difference in flap loss when vasopressors were administered, but an increased rate of microvascular thrombosis was noted ( $p = 0.003$ ). Continuous administration of vasopressors was associated with reduced venous congestion, whereas intermittent boluses increased risk of microvascular thrombosis.

**Conclusions:**

Our study confirms previous findings that intraoperative vasopressor use in free flap surgery is not associated with increased flap failure rate. Furthermore, continuous administration of vasopressors appears to be safer than administration via repeated boluses.

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**Abstract No.: 59**

**Category: Microsurgery**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Hyponatremia after microsurgical breast reconstruction: the importance of perioperative fluid management.

**Introduction:**

Perioperative fluid management is an important component of enhanced recovery pathways for microsurgical breast reconstruction. Historically, fluid management has been liberal. Little attention has been paid to the biochemical effects of different protocols.

This study aims to reduce the risk of postoperative hyponatraemia by introducing a new fluid management protocol.

**Materials and Methods:**

A single-institution comparative case-series analysis. Series sizes were defined a priori. A prospective series of patients managed using a new ‘modestly restrictive’ fluid management protocol is compared to a control-group managed with our original ‘liberal’ fluid management protocol.

**Results:**

130-patients undergoing microvascular breast-reconstruction at a single institution during 2021 are reported.

Hyponatraemia is demonstrated to be a significant risk with the original liberal fluid management protocol. At the end of the first post-operative day, mean fluid balance was +2838 ml (+/- 1630ml). 24/65 (36%) patients had low blood sodium level. 11% exhibited symptomatic hyponatraemia.

Introducing a new, modestly restrictive protocol reduced mean fluid balance on day one to +844 ml (+/-700) ( $p=<0.0001$ ). Incidence of hyponatraemia reduced from 36% to 14% ( $p=0.0005$ ). No episodes of moderate or severe hyponatraemia were detected.

Fluid administration between 8am and 8pm on the first post-operative day is the main risk factor for developing hyponatraemia (OR 7;  $p=0.019$ ). Modest fluid restriction, as guided by the new protocol, protects patients from low sodium level (OR 0.25; CI 95%; 0.11-1.61;  $p=0.0014$ )

**Conclusions:**

Our original fluid management protocol encouraged unrestricted liberal delivery of post-operative oral fluid. Patients were advised to drink frequently and to consume as-much-as 5000ml in the first 24 hours. This unintentionally, but frequently, resulted in moderate to severe hyponatraemia.

We present a new protocol, characterised by early cessation of intravenous fluid and an oral fluid limit of 2100ml/day. This study demonstrates significant reduction in the incidence of hyponatraemia and fluid overload.

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**Abstract No.:** 113

**Category:** Microsurgery

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Fifty free flaps from the Ear and No shades of grey

**Introduction:**

The purpose of this report is to present our 10 year experience using free flaps harvested from the ear region in facial, nasal and intraoral reconstruction with a focus on their reliability and technical tips for better outcome.

**Materials and Methods:**

Between 2011-2021 48 patients underwent microvascular reconstruction using 50 free flaps raised from the ear region based on the superficial temporal vessels. There were 30 males and 18 females with a mean age of 60 years (range 21-81 years). Defect aetiology consisted of post-tumour ablation (n=33), post-traumatic (n=10), burn scar reconstruction (n=2), deformity after radiotherapy (n=1), post-excision of a vascular malformation (n=1) and a congenital palatal cleft (n=1). Defect location involved the nose (n=28), floor of mouth (n=7), tongue (n=3), upper or lower eyelids (n=3), tracheoesophageal fistula (n=2), lower lip (n=1), hard palate (n=1) and contralateral ear (n=1).

**Results:**

Free flaps comprised of 22 helical flaps, 22 Temporal Artery Posterior Auricular Skin (TAPAS) flaps (including 4 combined TAPAS and conchal/helical flaps) and 6 hemiauricular flaps. Post-operatively, total flap necrosis occurred in 2 TAPAS flaps and 1 helical flap. The latter case later underwent successful reconstruction with the contralateral helical flap. Partial necrosis occurred in 2 hemiauricular flaps and 1 TAPAS flap. Overall flap survival was 94%. Follow-up time ranged from 1-120 months. A good aesthetic and functional outcome was achieved in all cases. However, all nasal alar reconstruction patients later underwent minor surgery for further aesthetic refinement.

**Conclusions:**

The ear region can provide a variety of small-to-medium size free flap options with unique qualities that provide reliable additions to the armamentarium of free flaps in facial, nasal and oral reconstructions. Furthermore, their indications have become more diverse and include the novel repair of two cases of tracheoesophageal fistula.

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**Abstract No.: 54**

**Category: Microsurgery**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Free Flap Surgery Outcome related to Antithrombotic Treatment Regime: An Analysis of 1000 Consecutive Cases

**Introduction:**

Autologous free tissue transfer is today an integral part of reconstructive plastic surgery, but still without generally accepted guidelines regarding antithrombotic agents. We hypothesized that the overuse of antithrombotic agents could be a risk factor for free flap complications and therefore studied a treatment protocol adjustment.

**Materials and Methods:**

Consecutive free flaps between 2005 and 2020 at a single center were analyzed for complications in relation to the use of pre- and intraoperative treatment with three different antithrombotic agents. The use of preoperative low molecular weight heparin (LMWH), intraoperative heparin, and dextran were analyzed in relation to outcome variables; thromboembolic events related to either flap thrombosis or systemic thromboembolism, or re-exploration for hematoma.

**Results:**

Nine hundred thirty-one patients underwent 1000 microvascular free flaps for breast (n=487), head and neck (n=365), and extremity (n=148) reconstruction. Within the first postoperative week 44 cases had a thromboembolic event and 58 cases underwent hematoma-related re-exploration. In the multivariate analysis thromboembolic events were associated with extremity reconstruction ( $p=0.02$ ) and smoking ( $p=0.02$ ). Hematoma-related re-exploration was more common with triple antithrombotic therapy compared to all other treatment regimes ( $p<0.05$ ). The number of antithrombotic agents used perioperatively were linearly decreased, from three to none, over the elapsed time period ( $p < 0.001$ ).

**Conclusions:**

Hematoma was the most common reason for re-exploration and was further associated with the use of multiple antithrombotic agents. Cessation of triple treatment was associated with less hematomas. Further reduction of antithrombotic agents did not result in any increase of thromboembolic events. According to our results, in combination with available literature, there is no evidence that additional antithrombotic agents, except for treatment with postoperative LMWH for DVT prophylaxis, would lead to a better microsurgical outcome.

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**Abstract No.: 267**

**Category: Microsurgery**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Temperature Control in Monitoring Vascularized Tissue with Simulated Arterial and Venous Thrombosis: An Animal Study

**Introduction:**

. The success of free flaps in reconstructive microsurgery relies on early recognition of postoperative vascular events, with 10% of free flaps suffering from vascular thrombosis. There are several postoperative monitoring methods to detect decreased perfusion, although none has gained overall acceptance. Surface temperature works as a surrogate marker for capillary circulation and is often used as monitoring methods. We aim to evaluate whether a novel infrared camera, FlirOne, can promptly detect changes in skin-surface temperature after simulated vascular occlusion in an animal model. Furthermore, we want to see if there is an agreement between FlirOne and the intracutaneous thermistor.

**Materials and Methods:**

Thirty-two rats were divided in four groups where either arterial or venous occlusion was simulated in the right side pedicled groin flaps. The contralateral side was used as either a positive or negative control. Temperature assessment was done before and after vessel ligature, at different time points using both an intracutaneous thermistor and FlirOne, an infrared camera, monitoring the skin-surface temperature. Body temperature was continuously measured by a rectal thermometer.

**Results:**

Our data showed that a venous thrombosis would result in a temperature increase. However, it could not establish the supposed temperature decrease expected in an ischemic event. There was a moderate agreement between instruments.

**Conclusions:**

In summary, Flirone showed a tendency to temperature increase in simulated venous thrombosis, suggesting that FlirOne could detect venous congestion better than arterial occlusion in pedicled groin flaps. This study might suggest that a venous occlusion will lead to both a surface and intracutaneous temperature increase. It could not establish whether there is an actual disagreement between methods or if the disagreement observed is due to confounding factors; further studies are needed to evaluate FlirOne reliability and agreement with standardized methods.

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**Abstract No.:** 218

**Category:** Microsurgery

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** The Effect of Perforator Number on Flap Viability in Perforator Propellar Flaps

### **Introduction:**

In this study, we present relationship between the number of perforators and complications in perforator propeller flaps used in the repair of huge defects.

### **Materials and Methods:**

Between 2018 and 2020, 52 patients whose defects were reconstructed with perforator propellar flaps in trunk region were included in the study. All of the patients have been operated for large size flaps ( $>50$  cm $^2$ ). The patients were divided into 2 groups as single perforator group (SPG) and double perforator group (DPG). Age, sex, comorbidity, defect etiology, flap dimensions and complications (epidermolysis, circulation problems and flap necrosis) were investigated, and two groups were compared. The mean follow-up was 14,6 months.

### **Results:**

There were 33 patients in the SPG and 19 patients in the DPG. The mean age of the patients was  $55.3 \pm 12.8$ , (SPG),  $48.1 \pm 10.6$  (DPG). Mean flap size was  $65.8 \pm 20.4$  cm $^2$  in SPG and  $66.7 \pm 22.1$  cm $^2$  in DPG. There was no statistical difference between flap sizes. Vascular doppler pulses could be obtained in all flaps. In the SPG, circulation problems were observed in distal part of 3 flaps including 4x4cm $^2$ , 2x3 cm $^2$  and 4x4 cm $^2$  areas, respectively. No circulation problems were observed in the DPG.

### **Conclusions:**

In our study, data that could directly associate circulatory complications with the number of perforators between the two perforator-based propeller flap groups could not be obtained. However, it was concluded that increasing the number of perforators could prevent possible circulatory problems by increasing the total angiosome area, considering that the increased flap size could go beyond the angiosome area. Inclusion of extra perforators is a useful and efficient method to prevent vascular insufficiency of huge flaps.

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# SESSION 3

# GENERAL PLASTIC

# SURGERY



Abstract No.: 269

Category: Clinical PRS General

Time: 8

CR: No

Event : 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

Title : Total Breast Reconstruction by Serial Autologous Fat Transfers (AFT) to the Expansion Reversal (ER) of the Pre-Expanded Mastectomy: The AFTER Procedure.

#### Introduction:

Autologous breast reconstructions with vascularized flaps provide long-term patient satisfaction but these invasive procedures have morbidities and potential complications. Less invasive autologous fat transfer (AFT) reconstructions stall because fat is not an expander. Alone it has limited capacity to stretch the mastectomy defect into a breast mound. Can this limitation be solved by pre-expanding the mastectomy followed by staged AFT to the recipient laxity created by expansion reversal (ER)?

#### Materials and Methods:

For the immediate reconstructions, we insert subpectoral expanders and graft 150-200ml as individual fat ribbons teased in-between the exposed muscle fibers. After adequate post-operative expansion, we remove the expander and graft the expanded tissues with 200-400ml of fat and restore the breast mound by inserting an implant half the expander size. To convert the already expanded implant reconstructed breasts to autologous fat, we remove the implant, replace it with a 50% smaller one, and graft the loosened intervening tissues. In both clinical situations we repeat the procedure every three months till the patient is implant free.

#### Results:

We reviewed 2000 consecutive breasts reconstructions with the AFTER procedure performed in out-patient surgery. Non-radiated mastectomies required 3.2 sessions to become implant free. At each session, the expanded breast volume remained constant as the intervening mastectomy tissue doubled from surviving grafts while the implant volume halved. Radiated breasts took 5.8 sessions, with less grafting per session and less than halving implant size. Follow up MRI revealed 9% incidence of fat necrosis, 4 patients had palpable nodules biopsied and found benign. Complications were minimal, more frequent in the radiated breasts and mostly due to overgrafting or excessive scar release in cases with previously complicated reconstructions. Patient satisfaction was very high, especially in implant to fat converted patients.

#### Conclusions:

AFTER is a safe and effective minimally invasive alternative to flaps for autologous breast reconstructions. Patients like it best.

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**Abstract No.:** 290

**Category:** Clinical PRS General

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Impact of radiotherapy and tabagism on Autologus Fat Transfer Total Breast Reconstruction after Nipple-Sparing Mastectomy: Long-term clinical and aesthetic results of a systematic protocol

**Introduction:**

Autologous fat transfer (FT) can be safely offered for total breast reconstruction after Nipple-Sparing Mastectomy (NSM). The aim of this study is to extend an existing FT protocol to smokers and compare the long-term results among them, irradiated and non-irradiated patients.

**Materials and Methods:**

Between January 2008 and December 2019, 117 breasts after NSM were prospectively enrolled and stratified in Group-A (25 irradiated), Group-B (21 smokers) and Group-C (71 control group). Exclusion criteria were comorbidities, local or distant recurrences, mastectomy skin flap complications. A standardized FT protocol was used. Data collected were patient demographics, surgery information, and performed an aesthetic analysis. Continuous and categorical variables were analysed with the Kruskal-Wallis H test and the Cohen's Kappa test was used to test interrater variability for the aesthetic analysis.

**Results:**

Groups were homogeneous for demographics ( $p>0.05$ ) while significantly different in number of FT sessions ( $p<0.001$ ), mean volume of the first two treatments ( $p=0.003$ ), and mean total volume of injected fat ( $p=0.002$ ). Volume, shape, position of the breast mound, IMF and scar location subscales obtained high score evaluations without a significant difference between groups ( $p > 0.05$ ), whereas skin texture subscale showed a lower score evaluation in Group-A ( $p=0.003$ ). Although a significant difference for total subscales was worse in Group-A ( $p=0.004$ ), the global score had a high rate evaluation in all groups ( $p=0.145$ ). Inter-rater reliability showed substantial agreement among all categories.

**Conclusions:**

From our cumulative 11-year experience, we found that total BR with FT can still be achieved in NSM patients with small-to-moderate breast size. Although further knowledge is required, in this prospective study we confirm the efficacy of our defined FT protocol for both irradiated and non-irradiated NSM patients and propose to extend its indication to smokers as well, offering it with comparable clinical and aesthetic results.

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**Abstract No.:** 53

**Category:** Clinical PRS General

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Fat Graft Pulmonary Embolism: Lymphatic System preferentially absorbs, concentrates and centrally delivers Micellar Emboli from Fat Grafts free Oil Fraction

**Introduction:**

Fat Pulmonary Embolism Syndrome (F-PES) complicates high-volume fat grafting. Adipocyte disruption generates triglyceride (TGC) oil dispersed in lipoaspirate (lipocrit). TGC plasma concentration ([TGC]p) was compared with lipocrit during liposuction-lipografting procedures. Interestingly, 1 buttock grafting case suffered a F-PES that required ICU support.

**Materials and Methods:**

n=27 (19 breast, 8 buttocks) lipocrit recorded and ([TGC]p) measured in peripheral blood samples preoperatively, intra and 24h postoperatively. F-PES patient underwent right subclavian vein access (SVC) and Inferior Vena Cava (IVC) at ICU admission.

**Results:**

Lipocrit (200-600 cc graft volume) ranged 19-27%.

Peripheral [TGC]p pre-, intra- post- and at 24h displayed no significant differences for all cases. In the F-PES case, SVC drawn [TGC]p was 7-fold higher than that from simultaneously drawn IVC or peripheral samples and returned to normal peripheral levels 48 h later. These unexpected data prompted measurement of:

1. Critical Micelle Concentration (CMC) of fat graft oil when mixed in either lymphatic (chylous, CMCC) or plasmatic (CMCP) fluids. CMCP was consistently higher than CMCC (CMCC=110 mg/dL, CMCP=320 mg/dL, n=17, P<0.001)
2. Interstitial Pressures (IP) both intramuscular (im) and subcutaneous (sc) at recipient sites. IPsc raised to pressures below 50 mmHg and returned to baseline within 24 h. IPim raised above 50 mmHg and persisted.

**Conclusions:**

F-PES appears associated to increased [TGC]p detectable at the central venous system only, undetectable in peripheral samples.

TGC micelle formation was thermodynamically adverse in plasma rather than in chyle, suggesting a lymphatic uptake of grafted oil at the recipient site.

This uptake could even be favoured when graft oil is implanted intramuscularly, where IP-im reach pressures that prevent venous drainage, possibly favouring lymphatic absorption instead (Starling independent drainage).

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**Abstract No.: 45**

**Category:** Clinical PRS General

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** USE OF AUTOLOGUS PLATELET RICH PLASMA AND SPLIT THICKNESS SKIN GRAFT FOR AUGMENTATION OF THE WOUND HEALING PROCESS IN COMPLEX WOUNDS

**Introduction:**

The increased prevalence of complex non-healing wounds due to diabetes and vascular disease represents a major healthcare problem with costly treatment and lengthy hospital stay. Platelet rich plasma (PRP) has regenerative, hemostatic and adhesive properties and it is widely used in wound treatment as well as in other fields in surgery. Although split thickness skin graft (STSG) is a gold standard for resurfacing large defects, it has a high incidence of complications and failure rate in complex wounds. The aim of our study was to evaluate the graft uptake and wound healing time in complex wounds resurfaced with STSG and PRP.

**Materials and Methods:**

Forty patients with complex postinfectious, posttraumatic and burn wounds were randomized in two groups: PRP +STSG (experimental group) and STSG alone (control group). All patients had diabetes and minimum one other comorbidity and delayed wound healing at least one month (range 31-92 days). PRP was freshly obtained without anticoagulant and used within 30 minutes. In the experimental group prior wound resurfacing with STSG, PRP was applied on the wound and then on the skin graft, no additional fixation was used. In the control group STSG was fixated with staplers. The follow up of the patients was until complete wound healing. Healing time and complications were assessed.

**Results:**

Wound healing time was statistically significant ( $p<0,01$ ) 29,6 days versus 71,2 days in control group. Two patients in the control group needed regrafting due to complete graft loss. Partial graft loss was noted in 10% of the experimental group and 25% in control group. No adverse effects were reported.

**Conclusions:**

Platelet rich plasma augments skin graft uptake and reduces wound healing time. It is a safe and efficient method for treatment of complex wounds. Studies with larger number of participants are needed for further investigation of this technique.

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**Abstract No.:** 197

**Category:** Clinical PRS General

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Reconstruction of full thickness wounds using Glyaderm and split skin grafts in a one-staged procedure - our first ten cases

**Introduction:**

Full thickness skin defects can be reconstructed with partial or full thickness skin grafts. To acquire an anatomically better skin reconstruction, dermal equivalents can be added to these grafts. The use of dermal matrices achieved good results in deep burns. Disadvantages of the available matrixes are their high costs and animal origin. Glyaderm a glycerol preserved acellular dermis and is derived from humane donor skin. It consists of collagen and elastin fibers and serves as a framework for the dermal layer in a skin reconstruction. This study assessed the results after reconstruction of full thickness skin defects using glyaderm in a one-staged approach.

**Materials and Methods:**

Glyaderm was introduced in 2017 in the Radboudumc to aid closure of large traumatic wounds, skin defects after infections or deep burns. During postoperative follow-up of our first ten cases, graft take, scar appearance, wound problems and re-interventions were recorded.

**Results:**

Patients were aged 3 weeks to 76 years old. Indications were: burns in 4 patients, traumatic wounds in 4 patients and skin defects after soft tissue infections in two patients. The treated skin surface varied from 1% to 20% total body surface. Follow-up varied from 4 months to 2 years. No complications occurred after surgery. The average take rate was 98%. Two patients had a later re-intervention to further improve the aesthetic appearance of a large scar with partial resection of the scar after prior expansion.

**Conclusions:**

Our first results of application of glyaderm in a one-staged procedure provided good healing, graft take and scar appearance. Glyaderm is found a suitable dermal substitute in the treatment of full thickness wounds. Advantages to other dermal substitutes are the lower costs and humane origin of the product.

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**Abstract No.:** 200

**Category:** Clinical PRS General

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Pressure sore incidence and treatment in Left Ventricular Assist Device (LVAD)-equipped patients: insights from a prospective series

**Introduction:**

Left Ventricular Assistance Device (LVAD) is indicated in patients with end-stage heart failure. Due to the non-physiologic blood flow, this therapy may favor the development of pressure sores with a devastating risk of infectious complications.

This extensive series shows prevalence and treatment of pressure sore in the LVAD population, to optimize management of these patients.

**Materials and Methods:**

We retrospectively investigated a prospectively maintained database including all patients who had LVAD implantation from November 2015 to December 2019. We evaluated the incidence, timeline, management (conservative versus surgical) of pressure sores, and outcomes.

**Results:**

42 patients benefited from LVAD, among which 5 (12%) developed a stage III or IV pressure sore (4/5 sacral; 1/5 ischiatic). Mean time to the development of pressure sore was 25 days. 4/5 patients were treated surgically and 1/5 conservatively. When surgery was chosen, staged procedure with delayed coverage after debridement was preferred. One patient had debridement without flap coverage, and one patient had negative-pressure wound therapy alone, due to poor overall condition. Half of the patients treated with surgery had major complications (1 hematoma, 1 wound dehiscence) requiring reoperation. Mean time to healing for patients treated with debridement and flap coverage was 6 weeks. Patient treated conservatively died before healing from cardiac-related condition.

**Conclusions:**

The rapid development of severe pressure sores in 12% of patients may reflect the maladaptive blood flow induced by LVADs, combined with the bedridden condition of these patients. Initial signs of pressure sores should be considered with particular attention, as rapidly evolving and needing an aggressive surgical treatment whenever possible (80%). Complication rate was similar to standard pressure sore flap treatment, and all patients benefiting from flap surgery finally achieved effective coverage after a mean follow-up of 20 months. No patient developed LVAD infection.

Surgery must be considered early in this population to prevent potential device infection.

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**Abstract No.:** 228

**Category:** Clinical PRS General

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Long-Term Follow-Up of Keloids Treated with Post-Operative Brachytherapy: Assessment of Effectiveness and Patient Satisfaction

**Introduction:**

Surgical excision of keloids is usually ineffective if performed alone. We aimed to assess the efficiency of surgical excision followed by post-operative intradermal brachytherapy in the treatment of keloids.

**Materials and Methods:**

We performed a retrospective observational study including patients treated in our centre between 2008 and 2019. All patients were treated with surgical excision followed by post-operative brachytherapy administrated in two fractions of radiation, with a total dose of 17 Gy. Patient and follow-up data were collected from medical records.

**Results:**

We included a total of 175 keloids treated in 107 patients. Patient mean age was 35 years. The keloids were located on the trunk in 100 cases (57 %), in the head and neck area 54 cases (31 %), and on the limbs in 21 cases (12 %). The most common follow-up time was three to four years (range 3 months to 11 years). Total recurrences were seen in eight keloids (5 %), which were treated with re-excision and post-operative brachytherapy. Partial recurrences were seen in 34 keloids (19 %), which were treated with intra-keloid corticosteroid injections. A majority (89 %) of recurrences appeared after 12 months of follow-up or more, 55 % appeared after two years or more, and only 11 % appeared within six months of treatment.

**Conclusions:**

Our results confirm the effectiveness of surgical excision followed by brachytherapy in the treatment of keloid scars. Furthermore, we show that a follow-up of at least two years after treatment is recommended to identify recurrences.

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**Abstract No.: 89**

**Category:** Clinical PRS General

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** A new era for the management of extensive AVMs thanks to theragnostic medication.

**Introduction:**

Arteriovenous malformations (AVM) are rare fast flow vascular anomalies. They aggravate over time and can cause devastating tissue involvement. Recent publications showed that the RAS/RAF/ERK/MEK is upregulated and involved in the pathology. Antiangiogenic or specific inhibitors could therefore become another important adjuvant in the management of AVMs.

**Materials and Methods:**

We conducted two prospective studies: One experimental observational study using thalidomide in 18 patients with severely symptomatic and extensive AVMs and one clinical trial on the use of trametinib in 10 adult patients.

**Results:**

With thalidomide, patients experienced rapid and important reduction of pain (VAS from 6-10 to 0-5) (18/18), cessation of bleeding (11/11), and healing of chronic ulcers (6/6). Cardiac failure resolved in all three affected patients. Reduced vascularity on arteriography was observed in two patients. One AVM appeared cured after 19 months of thalidomide and an 8-year follow-up. Eight AVMs were stable after a mean thalidomide cessation of 58 months, and four lesions recurred after 11.5 months. Combined treatment with embolization permitted dose reduction (50 mg/day) in 5 patients with clinical improvement. Five patients continued low dose thalidomide. Grade 3 side-effects were dose-dependent including asthenia (n=2), and erythroderma (n=2). With trametinib, all patients experienced a pain reduction and nine patients (9/10) showed a clinical volume reduction. Chronic ulcer healed in one patient (1/10), whereas 2 patients experienced new mucosal ulcerations (2/10) with recurrent bleeding needing treatment cessation. All patients experienced acne (10/10) and the severity was responsible of a treatment cessation in 2 patients (2/10).

**Conclusions:**

Continuous improvement of our knowledge on the underlying signaling pathway in AVMs allows us to propose novel theragnostic therapies. Available anti-angiogenic medication can improve the quality of life of our patients with extensive AVM. Moreover, their association with embolization and/or surgery can improve our long term result.

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**Abstract No.:** 255

**Category:** Clinical PRS General

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** 3D PRINTING OF ANATOMICAL, HISTORICAL MODELS FOR TRAINING IN PLASTIC SURGERY

**Introduction:**

As a substitute of real, living tissues, anatomical models have long owned a dual status as art objects and teaching tools. The advent of 3D printing technologies allows affordable, local production of these models from downloadable files.

**Materials and Methods:**

12 models from Hospital Museum of Institution B and 15 from the Museum of the Institution M were used as departure point. The authors of the original models include makers as Steger (1845-1938), Auzoux (1797-1880), Tramond (1846-1905), Fontana (1754-1805) and Spitzner (1833-1896). The choice was focused on facial, cervical and hand regions.

Computed tomography scans of the Institution B models and surface scans of the Institution M models were stored in standard DICOM (Digital Imaging and Communications in Medicine) format and transformed into stereolithographic files (.stl) by using free software. These files were transferred to a standard 3D printing device to produce scalable photopolymer resin copies.

**Results:**

Surface accuracies of 0.1 mm and 0.05 mm produced uneven surfaces without marked steps between layers. Printing time depended mainly on the size of the scaled model. Hollow structures sustained on internal grid patterns let considerable cost-cutting.

**Conclusions:**

Though they cannot compete with cadaveric dissection, the models spur familiarisation with spatial features and surgical marking which should lead to a greater confidence in surgical trainees. Pregraduate students may understand in a tactile way what they have seen as a 2D concept. Multiple copies may be delivered to a large audience during teaching sessions. The models are being deposited on an expanding, public database for free downloading.

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# SESSION 4

# HEAD & NECK



**Abstract No.: 217**

**Category: Cleft/Crani/Head & Neck**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Selective Ansa Cervicalis Nerve Transfer to the Marginal Mandibular Nerve for Lower Lip Reanimation

**Introduction:**

Injury of the marginal mandibular nerve (MMN) causes paralysis of the lower lip resulting in an asymmetric smile and oral incompetence. Immediate nerve reconstruction at the time of injury yields the best functional outcomes. However, in oncological resections of the facial nerve, the proximal facial nerve stump may not be accessible, and available donor nerves are usually prioritized for midface and eye reanimation. In this study, we explore the anatomical technical feasibility of a new nerve transfer - the selective transfer of the Ansa Cervicalis nerve (ACN) to MMN for lower lip reanimation.

**Materials and Methods:**

Anatomical dissections were conducted in 21 hemifaces in fresh human cadavers. The maximal harvestable length of ACN was measured and a simulation of its transfer to MMN was performed. The clinical outcome of three patients, where a selective ACN-MMN nerve transfer was performed, was analyzed at 1-year follow-up using Terzis' Lower Lip Grading Scale graded by 25 independent observers, and photogrammetry (Emotrics).

**Results:**

The mean maximal harvestable length of ACN was  $100 \pm 12$  mm. Direct tension-free coaptation of ACN to distal MMN was possible in all cases. An anatomical variant called "short ansa" was present in 33 % of anatomical cases. Evaluation of the outcome of the clinical cases showed good clinical lower lip reinnervation at 1-year follow-up. Scores from the independent observers confirmed significant improvement from 1.45 to 3.03 ( $<0.001$ ). Photogrammetry showed statistically significant objective improvement in facial symmetry, both when analyzing all measurements together, and measurements during smiling ( $P<0.001$ ).

**Conclusions:**

Selective nerve transfer of ACN to MMN is anatomically feasible in facial paralysis following oncological ablative procedures. It allows direct nerve coaptation without significant donor site morbidity. The case series showed good clinical outcomes at 1-year follow up and consistent anatomy that corresponds to findings in the cadaver study. A work-around for "short ansa"-cases is proposed.

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**Abstract No.: 18**

**Category: Cleft/Crani/Head & Neck**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Masseteric-to-facial nerve transposition for reanimation of incomplete facial paralysis

**Introduction:**

Reanimation of incomplete facial paralysis remains challenging because of the need to restore what is missing without causing damage to what has recovered. Masseteric-to-facial nerve transposition has emerged as a reliable alternative to hypoglossal nerve transposition, free muscle transfer, or cross-face nerve grafting.

**Materials and Methods:**

Thirty patients with incomplete facial paralysis were reanimated with masseteric nerve transfer. Commissural displacement and contraction velocity were measured with the FACIAL CLIMA, as well as spontaneity and symmetry. Satisfaction was also assessed with a validated questionnaire.

**Results:**

FACIAL CLIMA showed improvement in commissural excursion and velocity, with improved symmetry and high satisfaction rates. Furthermore, women showed significantly higher rates of smile spontaneity.

**Conclusions:**

The masseteric-to-facial nerve transposition is a reliable alternative for reanimation of the smile in patients with incomplete facial paralysis. Its main advantages include its consistent anatomy, a one-stage operation, and low morbidity at the donor site.

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**Abstract No.:** 258

**Category:** Cleft/Crani/Head & Neck

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Double cross-face nerve grafting with masseteric-facial nerve coaptation and with fascia lata suspensions of nasolabial fold, nasal ala and lower eyelid: One-stage technique for facial reanimation

**Introduction:**

Cross-facial nerve grafting (CFNG) for facial reanimation is the standard treatment for recent acquired unilateral facial palsy providing spontaneity. The limitation of the method is the time required for nerve regeneration and the loss of axons when using nerve grafts. Masseteric nerve (MN) has been described for babysitter procedure as well as for direct facial nerve coaptation as a potent neurotizer with high axonal load enabling early neurotization. The aim of this paper is to introduce a surgical approach for one-stage facial reanimation with double CFNG and ipsilateral masseteric-facial nerve coaptation together with the fascia lata suspensions (FLS).

**Materials and Methods:**

Between October 2019 and August 2011, 5 patients, mean age 49.4 years [range, 35-58years] affected by complete unilateral facial paralysis underwent one-staged facial reanimation. Ipsilateral MN was utilized for reinnervation of the upper zygomatic branch; contralateral distal zygomatic and buccal branches for reinnervation of the affected lower zygomatic and lower buccal branches via two CFNGs. Static compartment consisted of nasolabial fold, nasal ala and lower eyelid FLS. Preoperative and postoperative assessments were performed by means of videos and photo documentations. We combined the clinician-based grading system (eFACE score) with the Facial Palsy Disability Questionnaire (FPD-Q) to gather the physician and patient perspectives together.

**Results:**

In all the patients, facial symmetry at rest and lagophthalmos of the lower eyelid were enhanced immediately. Voluntary smile while biting down was observed within 4-5 months and spontaneous smile was restored within 8-10 months postoperatively. The mean improvement in eFACE score was 33.3% [range, 25-40]. a mean improvement in FPD-Q score was 28.2% [range, 20.4-50.5%]. None of our patients experienced a major complication.

**Conclusions:**

Double CFNG with masseteric-facial nerve coaptation and with FLS is a new reliable single-stage technique for facial reanimation. Restoration of static functions occurs immediately after surgery, followed by a gradual smile recovery.

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**Abstract No.: 12**

**Category: Cleft/Crani/Head & Neck**

**Time: 4**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Masseteric nerve transference with sling tendon for symmetry in the restoration of facial paralysis: an effective combination of dynamic and static correction.

**Introduction:**

Masseteric nerve transposition has shown to be an effective technique for the treatment of facial paralysis, achieving good commissural excursion and dynamic symmetry. However, some patients with a heavy face and complete facial paralysis have an incomplete recovery after surgery characterized by a symmetrical smile with asymmetry at rest, which affects the cosmetic appearance. For these patients, we propose a novel combination of masseteric nerve transposition for the dynamic rehabilitation of the smile with a tendon sling suspension to create symmetry at rest.

**Materials and Methods:**

We have used this combined technique in 15 patients. The average age of the patients was 38,5 years old with different causes for facial paralysis, being the most frequent acoustic neurinoma resection. The longest time since paralysis onset was 34 months and the shortest, 18 months. The decision to perform the combined procedure was made in most cases during preoperative assessment when severe asymmetry was observed at rest.

**Results:**

After an average follow-up of 12.9 months complete reinnervation was observed in all cases with good outcomes; both aesthetic and functional. Overall satisfaction was 90%. Only two patients received the suspension at a different surgical time. Postoperative evaluation with FACIAL CLIMA was also assessed for both the static and dynamic results. The average improvement in the commissure position measured 3 months after surgery was 6,2 mm. No major complications were encountered, considering these as a failure in the nerve transference or those that require a new surgical intervention.

**Conclusions:**

A combination of both dynamic and static techniques for complete facial paralysis rehabilitation may provide adequate symmetry with the contralateral healthy side both at rest and when smiling. It is a simple procedure that adds little morbidity and that can be performed in the same surgical procedure.

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**Abstract No.: 29**

**Category: Cleft/Crani/Head & Neck**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** What are factors affecting optic nerve damage in Le Fort Osteotomy?

**Introduction:**

There have been few reports of blindness and visual impairment after Le Fort type osteotomies for syndromic craniosynostosis, and the obvious cause is unknown. Therefore, we thought that we should investigate whether there are any triggers for optic nerve damage, as well as whether there are any signs providing guidance in how to prevent it. We focused on intraoperative blood transfusion volume and operating time.

**Materials and Methods:**

The study participants were patients who underwent Le Fort osteotomy for syndromic craniosynostosis performed between 1999 and 2020 in our hospital. Pupillary reflex, pupil size, operating time, blood transfusion amount per body weight, age at time of surgery, sex, and syndromic type were verified via medical records. Of these, cases with insufficient clinical data were excluded.

Multiple logistic regression analysis was performed on each factors as objective variables, and the significance level was evaluated at 0.05.

**Results:**

There were 59 patients, including 37 males and 22 females. The average operating time:  $364 \pm 105.1$  minutes. The average blood transfusion amount per body weight:  $27.7 \pm 17.9$  ml / kg. The average blood transfusion amount per body weight per hour:  $4.47 \pm 2.79$  ml / kg / min. The average age at time of surgery was  $11.8 \pm 4.1$  years. The syndromic types: Crouzon; 34, Apert; 21, Pfeiffer; 4. The surgical procedure: Distraction; 49, conventional; 10. There were 18 cases with abnormal pupillary findings. Of the 18 cases, 17 had no abnormalities in subsequent visual function, and 1 had blindness. The abnormal pupil findings were correlated with the amount of blood transfusion/body weight, the operating time, and the amount of blood transfusion/body weight/hour.

**Conclusions:**

In this study, at least when intraoperative bleeding increases and the amount of blood transfusion increases, especially in cases where there is bleeding in a short time, optic nerve damage is likely to occur. Therefore, pupils should be checked immediately after surgery.

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**Abstract No.: 10**

**Category: Cleft/Crani/Head & Neck**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Surgical treatment of large congenital melanocytic nevi of the nose.

**Introduction:**

Congenital melanocytic nevi of the nose and adjacent facial region are unusual. Although their malignant potential can be debated, they present a significant aesthetic concern. In this abstract, the authors present an expanded approach to evaluation and treatment of these lesions.

**Materials and Methods:**

17 patients aged 11 months to 14 years, were operated from 2003 to 2021. All patients had large congenital nevi involving the nose, with or without extension into one or both cheeks, the surrounding periorbital and lip areas and to the glabellar region. Follow-up ranged from 12 months to 18 years.

**Results:**

All patients were treated successfully with surgical excision of their congenital nevi and reconstruction with local flaps (expanded or not expanded) or distant flaps (expanded forehead and SCIP flaps). The workhorse for reconstruction was the expanded flap of the forehead. Adjacent areas were reconstructed with local expanded flaps (cheeks), distant flaps and full thickness skin grafts (eyelids). Complications included infection in two patients, expander exposure in two patients and asymptomatic medial ectropion in one patients.

**Conclusions:**

Early evaluation and treatment of large congenital melanocytic nevi of the nose may help in preventing the aesthetic, functional, and health-related issues for the patients. Although most of the current group of young children will not reach full facial growth for more than another decade and a half, and therefore await critical assessment of their long-term outcomes, the authors hope that the surgical experience gained to date will assist surgeons in managing these complex reconstructions.

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**Abstract No.:** 292

**Category:** Cleft/Crani/Head & Neck

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Surgical management of Facial Congenital Melanocytic Naevi and use of the novel PROM, SCAR-Q, to assess outcomes

**Introduction:**

Congenital Melanocytic Naevi (CMN) is a proliferation of benign melanocytes that are present at birth or develop shortly after. It has been noted that surgery for CMN does not reduce the risk of malignant transformation and thus is performed to improve cosmesis and the psychological morbidity. We present the first use of the SCAR-Q scoring system in assessment of patients who have undergone excision and reconstruction for facial CMN.

**Materials and Methods:**

89 patients were initially identified spanning a 10-year period from 2010-2020 who were treated surgically for facial CMN. 18 patients were excluded as they <8 years old at time of data collection. SCAR-Q score and Patient & Observer Scar Assessment Scale (POSAS) were included for 28 patients.

**Results:**

Average age at time of surgery; 6yr 3m compared to average age at data collection 15yrs. The remaining patients (N=71), included 27M and 44F and had a total of 147 different surgical procedures; Shave excision (N=1); simple excision & primary closure (N=23); Excision & skin grafting (N=12); serial excision (N=27); Serial excision with skin grafting (N=6); Tissue Expansion and excision (N=2); 12.7% (9/71) patients required further operations. Patients were satisfied with their appearance; reflected by Scar-Q scores  $75.5 \pm 19.2$  had few symptoms  $78 \pm 19.2$  and their scar did not have a psychosocial impact on them  $83.3 \pm 18.4$ . Male patients scored higher on their appearance and psychosocial scores. Lesions on the chin, nose and scalp scored highest compared with cheek, forehead, ear and temple which scored lowest.

**Conclusions:**

The SCAR-Q will offer a new PROMS scoring system which takes into account patient's views on appearance, symptoms and psychological impact of scarring. Patient's who can viably have lesions removed in a single procedure were seen to score highest and patients who underwent serial excision and skin grafting were found to have the most pronounced symptoms.

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**Abstract No.:** 235

**Category:** Cleft/Crani/Head & Neck

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Superficial peroneal nerve accessory artery (SPNAA) flap for head and neck reconstruction

**Introduction:**

Several different flaps can reconstruct intraoral defects or lower limb deficits after free fibula osteo-cutaneous flap harvesting for jaw reconstructions. However, commonly used options may not be available for various reasons and can be associated with significant morbidity. We hypothesized that flaps supplied by the superficial peroneal nerve accessory artery (SPNAA) could be a viable alternative reconstructive option.

In this study we performed a literature review, we investigated the anatomy through cadaveric dissection and used the SPNAA flap in head and neck reconstruction (both as propeller for fibula defects closure and as a free flap for intraoral reconstruction)

**Materials and Methods:**

We described the SPNAA's anatomy performing 20 human cadaveric leg dissections. and eight cases involving SPNAA-based perforator flap reconstructions (six propeller flaps and two free flaps) were performed. Patient-specific baseline variables and intraoperative and postoperative outcomes were identified.

**Results:**

Cadaveric dissection suggested that the location of the SPNAA is reliable but its origin varies, with 40% (N = 8) of SPNAAs being of type I origin, 20% type II (N = 4), and 40% (N = 8) type III in our series. All reconstructions were successful. No intraoperative complications occurred during propeller or free-flap reconstructions. No flap failures occurred. One propeller reconstruction showed distal superficial skin necrosis and one donor site wound dehisced; both were successfully managed conservatively. No other short-term or long-term complications occurred.

Among the limits, the short pedicle, when used as a free flap is to taken into account when planning the reconstruction and it appeared to be more suitable for the mouth floor/tongue than other anatomical regions

**Conclusions:**

Flaps based on SPNAA perforators appear effective, reliable, and safe reconstructive methods for covering fibula osteocutaneous donor site defects and for intraoral reconstructions. Controlled trials are required to compare its effectiveness and safety with other reconstructive methods.

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**Abstract No.:** 127

**Category:** Cleft/Crani/Head & Neck

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Management and outcomes of post-maxillectomy free flap reconstructions

**Introduction:**

Maxillary reconstructions following tumor resection can still present as a surgical challenge as effects on speech, swallowing, and mastication along with aesthetic considerations can be of paramount importance. We are presenting our experience and outcomes following such reconstructions.

**Materials and Methods:**

We reviewed 56 patients with maxillectomies, and 58 free flap reconstructions, performed in our center from 2010 to 2021. Maxillectomy defects were divided based on Cordeiro's classification. Two patients had Type I (3.6%), 30 patients Type II (53.5%), 22 patients Type III (39.3%) maxillectomies, and two patients had maxillectomies with orbital exenteration Type IV (3.6%).

**Results:**

Out of 58 flaps, the most common flap was the fibular free flap with 25 patients (43.1%) and the second most common was the radial forearm flap with 14 patients (24.1%). The flap survival rate was 96.4% with 2 flap losses (one free fibula and one radial forearm flap). Pedicle compression was identified to be the main factor for flap re-exploration or flap loss. Histology results showed squamous cell cancer to be the most common cause with 38 patients (67.8%) and adenoid cystic carcinoma as the second most common with 18 cases (32.1%). We obtained patient-reported outcomes measures (PROMs) from 27 patients (48%) with University of Washington (UW) quality of life questionnaires with mostly satisfactory results.

**Conclusions:**

Following the literature and our center's experience, free flap reconstructions are the gold standard for the reconstruction of maxillary defects with high patient satisfaction. We will be presenting our rationale behind different flap selection and lessons learned to avoid potential complications.

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**Abstract No.: 78**

**Category: Cleft/Crani/Head & Neck**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** A data linkage study of the epidemiology, surgical management and psychosocial impact of microtia in Wales.

**Introduction:**

Previous studies of microtia epidemiology have demonstrated global variability. This study uses data linkage to characterise the incidence of microtia in Wales, and determine whether patients opt for autologous or prosthetic reconstruction and if this is influenced by socioeconomic factors. We additionally explore whether microtia, and subsequent surgery, conveys any risk of influencing school performance or the development of anxiety or depression.

**Materials and Methods:**

Patients with microtia were identified from the Patient Episode Database for Wales and Primary Care GP dataset using International Classification of Disease 10 (ICD-10) codes and read codes. Data linkage of primary and secondary National Health Service (NHS) datasets were used to study the demographics and hospital episode statistics of this patient group. Ordinal and logistic regression analyses were used to determine the odds of impaired school performance or diagnosis of an affective disorder compared to age matched controls.

**Results:**

101 microtia patients were identified between 2000-2018, of which 48 patients (47.5%) had auricular reconstructive surgery. The mean annual incidence was 2.13 microtia cases per 10,000 births over the 19-year study period. 27.1% had prosthetic and 72.9% had autologous auricular reconstruction with a median distance of 20.8 miles travelled for surgery. There were no significant differences in socioeconomic status between the autologous and prosthetic reconstruction cohorts ( $p=0.488$ ). Microtia was not predictive of school performance or a diagnosis of anxiety ( $p=0.4$ ) or depression ( $p=0.7$ ). Socioeconomic deprivation and gender were found to influence both outcomes, independently of a microtia diagnosis.

**Conclusions:**

The incidence of microtia in Wales is double that previously reported, with regional geographic variation, bearing implications for service design and delivery, particularly as most patients opt for autologous reconstruction. That a diagnosis of microtia is not associated with impaired psychosocial parameters is indicative of good social and educational integration of this cohort.

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**Abstract No.: 46**

**Category: Cleft/Crani/Head & Neck**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Lower lid reconstruction with a chondromucosal alar graft and upper lid myocutaneous flap over 38 years of practice.

**Introduction:**

In this retrospective study we review the results of lower eyelid reconstruction using Texier's procedure. Texier's procedure consists of an alar chondromucosal graft combined with an upper eyelid orbicularis oculi myocutaneous flap for posterior and anterior lamellar reconstruction respectively. Moreover, a comparison to Mustarde's method for lower eyelid reconstruction will be discussed.

**Materials and Methods:**

Since 1983, 84 patients, 51 men and 33 women, with lower eyelid lesions were treated using Texier' procedure. Age range was 39 to 86 years (average age 67 years). Basal cell carcinoma (BCC) was the main cause for operation in 69 patients, while 7 had squamous cell carcinoma (SCC), 3 cutaneous melanoma (CM) and 5 suffered lid defects of other etiology. A medially based orbicularis oculi myocutaneous flap was used for medial marginal lid defects in 5 patients. 42 patients had partial full thickness lower lid defects, involving >50% of the length of the lower eyelid, 11 were treated with a medially based and 31 with a laterally based flap. Finally, in the 37 patients that underwent a total lower eyelid reconstruction, a laterally based flap was used. The donor site for the chondromucosal graft was consistently the contralateral nasal ala.

**Results:**

The average follow-up was 3,2 years.

Early and late complications developed in 5 and 2 patients respectively. All complications were addressed and resolved accordingly.

Aesthetic and functional results were assessed.

**Conclusions:**

Texier's procedure for lower eyelid reconstruction is a reliable alternative to Mustarde's method with many advantages as it offers a superior tissue match. Furthermore, it provides a muscular layer for the palpebra, and the ectropion rate is very low. It is a simple procedure, performed under local anesthesia providing high patient satisfaction.

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**Abstract No.:** 282

**Category:** Cleft/Crani/Head & Neck

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Decrease in prevalence of cleft lip, alveolus and palate after nationwide introduction of the second-trimester anomaly scan in the Netherlands

**Introduction:**

Previous international studies have suggested that introducing a second-trimester anomaly scan (SAS) leads to an increased rate of terminations of pregnancy in fetuses with orofacial clefts (OFCs). Globally, however, the nationwide impact of the SAS on the prevalence of OFCs has never been examined. The main objective of this study is to investigate the prevalence and demographics of OFCs and their three categories in the Dutch population over a period of 23 years. In addition, the potential relationship between the nationwide introduction of SAS, these OFC groups and the rate of TOP in the Netherlands is examined.

**Materials and Methods:**

In this retrospective cohort study, patient data were extracted from the national Dutch database. A total of 7,412 patients were included between 1997 and 2019. Patients were divided into three categories: cleft lip with or without alveolus (CL/A), cleft lip, alveolus and palate (CLAP) and cleft palate (CP). Data before and after the nationwide introduction of the SAS on January 1, 2007 were compared.

**Results:**

In total, 1 in 2,256 OFC patients were diagnosed with CL/A (n=1,888), 1 in 1,648 with CLAP (n=2,584) and 1 in 1,448 with CP (n=2,940). Prevalence of clefts before and after 2007 did not differ (1/575 versus 1/576, P = 0.83). Prevalence of CLAP decreased after 2007 (P = 0.02), CL/A remained stable (P = 0.07) and CP increased after 2007 (P < 0.001).

**Conclusions:**

This study demonstrates a significant decrease in the prevalence of CLAP after the nationwide introduction of the standardized SAS. However, due to an increase in the number of patients born with a CP, the prevalence of all patients born with OFCs in the Netherlands did not change.

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**Abstract No.: 88**

**Category: Cleft/Crani/Head & Neck**

**Time: 4**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** A Simple Extraoral Botulinum Toxin-A Injection Technique to the Lateral Pterygoid Muscle: A Cadaveric Study and Clinical Implications

**Introduction:**

Lateral pterygoid muscle (LPM) activity is associated with the pathological mechanisms of some temporomandibular disorders (TMDs). We aimed to define and demonstrate a novel, practical and safe botulinum toxin-A injection technique to the LPM based on our findings. Our secondary aims were to standardize the injection pattern according to the variations of the LPM and its surrounding anatomical structures, and to show its advantages over the intraoral injection.

**Materials and Methods:**

Twenty cadaver half-heads were dissected. The LPM and its surrounding structures were investigated in terms of anatomical variations. Based on those findings a standardized extraoral injection protocol was defined and compared with the intraoral injection technique in terms of accuracy and safety.

**Results:**

We found that the average depth of the lateral pterygoid plate from the skin surface was  $49.9 \pm 2.2$  mm and the mean lateral pterygoid plate width was  $10.5 \pm 3.9$  mm. Our extraoral injection approach based on the location of the maxillary tuberosity, tragus, and the lateral pterygoid plate was consistent in all dissections in terms of the accuracy of the intramuscular injection. In the intraoral approach, the entry point of the needle through the oral mucosa is hard to standardize which makes the adjusting the depth of the injection very difficult while increasing the risk of neurovascular injury.

**Conclusions:**

The clinical significance of the LPM makes it worthwhile to implement minimal invasive treatments prior to more invasive options. We defined a safe, accurate, and reliable approach with its ease of administration in patients with TMDs. Considering that as plastic surgeons we perform many botulinum toxin injections in our daily practice, and the patient population with TMJ and LPM-related symptoms, we anticipate that this technique will find a place in the armamentarium of plastic surgeons.

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**Abstract No.: 72**

**Category: Microsurgery**

**Time: 4**

**CR: No**

**Event : 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022**

**Title : FACIAL DISFIGUREMENT AND FUNCTIONAL IMPAIRMENT. HOW DO PATIENTS FEEL**

**Introduction:**

Head and neck cancer is one of the most devastating cancers globally, with its incidence continually increasing. Early detection, combination of surgical and adjuvant therapies could provide the best possible outcome. However, especially in advanced stage cases, salvaging or palliative surgery is required resulting in high psychosocial morbidity. Thus, these patients are disfigured and functionally impaired presenting a withdrawal from social interaction. The present study identifies psychological parameters -anxiety levels and depression -affecting the quality of life of patients with head and neck cancer that reconstructed with free tissue transfer in a tertiary oncological hospital.

**Materials and Methods:**

This is a retrospective study conducted with patients who underwent reconstructive surgery at the General Oncological Anticancer Hospital 'Agios Savvas' between 2018 and 2021. The data collection was performed by completing the EORTC QLQ- H&N 35 questionnaire on a phone call. Descriptive and inductive statistical analysis were performed with SPSS 24. The level of statistical significance was defined as  $p<0.05$ .

**Results:**

From 2018 to 2021, 21 patients with head and neck cancer were operated on in the plastic surgery and reconstruction clinic. Microsurgical reconstruction was used in all these patients. Only 18 of these patients could answer questions or be still alive (87.5%) with a mean age of 57.7 years (SD 16.1). 5 of these patients were women (27.7%), and 33.3% of them underwent maxillectomy, 38.7% glossectomy (total and hemiglossectomy) and 18% parotidectomy. In 6 patients, microsurgical reconstruction was performed using ALT flaps.

The frequency of depression was 38% and anxiety 28% in our patient sample. Statistically significant differences were noticed between depression and gender ( $p=0.035$ ). Statistically significant is the difference between the two genders regarding somatic pain and physical vitality ( $p<0.0005$ ).

**Conclusions:**

Patients with head and neck cancer develop high levels of both anxiety and depression. Psychological, appetite disturbances and fatigue appeared to be gender-related.

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# SESSION 5

# LEFT BREAST



**Abstract No.: 219**

**Category:** Clinical PRS General

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Effects of postoperative RT on immediate prepectoral reconstruction with polyurethane-coated implants: preliminary experience

**Introduction:**

In recent years, prepectoral breast reconstruction has increased in popularity, becoming a standard reconstructive technique while preserving the anatomy and function of the pectoralis major muscle. The prepectoral reconstruction with polyurethane-coated implants has been recently utilized with encouraging results, but its interaction with post mastectomy radiotherapy (PMRT) is still unknown. As is well demonstrated in the literature on implant-based breast reconstruction, when PMRT is required, adverse effects on breast reconstruction are common. The breast volume can be irradiated with conformational 3D technique or with modulated intensity technique (IMRT) with the aim of improving target coverage and dose homogeneity, in order to allow better overall cosmetics in the medium and long term. The aim of this study was to evaluate the aesthetic outcomes and radiotherapy (RT) damage in patients who underwent prepectoral reconstruction with polyurethane-coated implants and PMRT. Additionally, the impact of mastectomy flap thickness on the adverse effects of RT was investigated..

**Materials and Methods:**

The aesthetic results and RT damage were respectively evaluated with Likert scale and LentSoma score in 50 patients who underwent immediate breast reconstruction with prepectoral polyurethane-coated implants and PMRT. The impact of the different RT technique (3D vs IMRT) on the outcomes was retrospectively reviewed. The correlation between mastectomy flap thickness and the adverse effects of radiotherapy was analyzed.

**Results:**

At the 12-month follow-up, the mean Likert score for patients underwent RT with IMRT and RT with 3D technique was respectively 13.06 and 11.79 (standard deviation: 2.55 and 2.37), and the LentSoma score was 1.46 and 3.11 (standard deviation: 1.13 and 1.41). A negative linear correlation between mastectomy flap thickness and RT damage was identified.

**Conclusions:**

The preliminary results of the study are encouraging in the use of prepectoral polyurethane-coated implants in immediate breast reconstruction and PMRT, especially in patients who underwent IMRT radiotherapy and with "thick" mastectomy flaps.

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**Abstract No.: 68**

**Category:** Clinical PRS General

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** “Direct to implant (DTI)” disasters: a new wave of severe complications after postmastectomy reconstruction.

**Introduction:**

A recent trend exists toward immediate prepectoral placement of a permanent implant after mastectomy, in an attempt to reduce operative stages and costs. Implants are usually completely covered by ADMs or synthetic meshes. Unfortunately patients with severe problems after DTI reconstructions are increasingly seen, representing a new wave of severe postmastectomy reconstruction complications which deserves being reported.

**Materials and Methods:**

From January 2016 to January 2021, 46 patients were operated for complications after DTI procedures, out of 321 secondary breast reconstructions. All women had prepectoral anatomical textured implants, covered by ADM (30 pts) or synthetic mesh (16 pts). Fifteen patients had previously received radiation therapy.

Thirtyeight women showed severe painful capsular contracture, implant dislocation and/or visibility of the mesh. Impending exposure or implant /mesh exposure was seen in 8 patients. All women showing mesh visibility, impending extrusion or implant extrusion had synthetic meshes covering the implant. In all patients the implant and part of the mesh were removed. Total mesh removal was often impossible due to adherence to thin overlying dermis. Fourtythree patients underwent subpectoral positioning of a new implant and lipostructure, while 3 women had autogenous reconstruction.

**Results:**

Deformities observed after DTI were seen in women who had previous radiation therapy, skin tightness or thin skin covering the implant. The most severe complications were seen in women with synthetic mesh covering the prosthesis.

Salvage/ revision surgery was effective, providing good to excellent results in all patients after 2 to 4 operative stages and refinements.

**Conclusions:**

Breast deformities after DTI represent a new wave of complications. Proper patients' selection is crucial to avoid complications : women with previous radiation therapy, tight skin or absent subdermal fat layer should not be considered candidates to DTI prepectoral reconstruction. Synthetic meshes in a superficial environment should be avoided.

Secondary correction or salvage is effective in achieving final satisfactory results.

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**Abstract No.:** 237

**Category:** Clinical PRS General

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Improving decision-making in prepectoral direct-to-implant reconstruction after nipple sparing mastectomy: patient selection by digital mammography

**Introduction:**

the optimization of nipple sparing mastectomy and implant-based reconstruction techniques led to an increase in the popularity of prepectoral reconstruction. The aim of this study is to explore the digital mammographic breast tissue coverage assessment as preoperative tool able to predict the risk of fearful complications in prepectoral reconstruction.

**Materials and Methods:**

we retrospective analyzed 124 preoperative digital mammograms of 100 patients who underwent implant-based reconstruction. BMI > 40, active smoking, previous radiotherapy, neoadjuvant chemotherapy, poorly controlled diabetes mellitus, chronic immunosuppression, and postmastectomy radiotherapy were considered exclusion factors. We applied the breast tissue coverage classification reported by Rancati. The intraoperative mastectomy flap thickness was measured in all patient (0.8 cm was the minimum value to perform prepectoral reconstruction). We investigated the correlations between the digital mammographic breast tissue coverage mean value and intraoperative mastectomy flap thickness (Spearman's Rank Correlation). We assessed the presence of statistically significant differences in distribution of complications related to mean breast tissue coverage and mastectomy flap thickness (Mann-Whitney U Test).

**Results:**

The mean digital mammographic breast tissue coverage was 1,60 cm ( $SD \pm 0,75$  cm), and mean mastectomy flap thickness was 1,55 ( $SD \pm 0,66$  cm). 36 patients were breast tissue coverage type 1 (28,8%), 50 patients type 2 (40,3%), and 38 patients type 3 (30,4%). A statistically significant positive linear correlation between digital mammographic breast tissue coverage and mastectomy flap thickness was identified (correlation coefficient: 0,95; p-value: 0,00). All complications (2 minor mastectomy flap necrosis, 1 implant exposure, and 5 major ripples) were found in patients with type 1 breast tissue coverage (up to 1 cm). We found a statistically significant difference in distribution of mastectomy flap necrosis (p-value: 0,01) and ripples (p-value: 0,005) related to mean digital mammographic breast tissue coverage.

**Conclusions:**

The type 1 of breast tissue coverage represents the risk group for mastectomy flap necrosis and ripples.

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**Abstract No.: 281**

**Category: Microsurgery**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Risk reducing lymphedema surgery: preliminary results with Targeted Lymphatic Axillary Repair (T-LAR) approach

**Introduction:**

When we are faced with breast cancer surgery, we treat breast with either mastectomy or conserving surgery, and we assess axillary lymph nodes involvement with either sentinel node biopsy or axillary lymph node dissection (ALND). By means of this approach, we obtain information to further evaluate the disease and offer the patient the right oncological treatment. In contrast, when we perform immediate reconstructive surgery, we usually only focus on breast reconstruction neglecting surgery received in axilla. Nowadays, risk of postoperative lymphedema can reach up to 32% after 2 years.

**Materials and Methods:**

Prospective study of 35 patients (34-68y) affected of breast cancer, who had to undergo breast surgery and ALND. All of them were accepted for simultaneous immediate breast and lymphatic reconstruction (January 2018- December 2020). Reverse mapping with ICG-Lymphography (ICG-L) helped identify arm afferent lymphatics which were anastomosed with small tributaries of axillary vein. All patients were followed up for a minimum of 10 months by our physiatrists and with ICG-L.

**Results:**

A total of 51,4% patients received neo-adjuvant chemotherapy. During surgery, arm afferent lymphatics were identified in 34/35 patients. Mean lymphatico-venous anastomosis (LVA) performed was 2,1 per patient. Mean number of axillary nodes obtained was 12,4 and 57,5% patients had positive nodes. Adjuvant radiation was administered in 87,5%. No hematoma or seroma post-operatively. No clinical lymphedema observed by our physiatrists. ICG-L demonstrated subclinical lymphedema in one patient (2,8%).

**Conclusions:**

Prophylactic lymphedema surgery with immediate LVA after ALND is a promising technique. Our preliminary results are encouraging because we handle healthy lymphatics and healthy veins and with that, we have more chances for satisfactory results. More long-term and randomized controlled trials are needed, to establish real indications and to standardize technique. Nevertheless, with our study, besides reducing risk of lymphedema, progress has been achieved related to physiological and anatomical knowledge of axillary lymphatic system.

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**Abstract No.:** 132

**Category:** Microsurgery

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Preoperative Planning of DIEP flap reconstruction surgery by Virtual Reality

### **Introduction:**

Virtual reality (VR) technology is rapidly spreading throughout medicine. In the context of deep inferior epigastric perforator (DIEP) flap, the use of VR showed increased anatomical visualization compared to CTA scans, allowing surgeons to carefully tailor surgical plans during preoperative. Here we will represent a retrospective study using a recently developed software, Amplifier VR © in Preoperative planning in patients who underwent DIEP flap breast reconstructive surgery.

### **Materials and Methods:**

DICOM data of DIEP flap breast reconstruction surgeries were examined between 2013-2020. CTA scans were reconstructed using Amplifier VR ©. Perforants coordinated were measured using both methods, CT scans and VR and compared. Additional vessel details including intramuscular course complexity (IMC), adiposity and branching within the adipose tissue (AB), and vessel caliber (VC) were measured using VR.

### **Results:**

Forty-four patients were included in the study. A total of 43.1% (56/130) perforators were matched using VR to CTA imaging studies.

Using the VR, 46.2% had low IMC, 30% intermediate IMC, 23.9% complex IMC. AB was low in 15.4%, medium in 34.6% and high AB was found in 50% of perforators. Finally, VC was low in 16.9%, medium in 43.9%, and large in 39.2%.

### **Conclusions:**

Using Amplifier VR© give a 3D picture with more details that can improve preoperative planning helps the surgeon with the complex decision-making task of selecting the best perforator for flap harvest.

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**Abstract No.: 195**

**Category: Microsurgery**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Correlation between Dynamic Infrared Thermography and Indocyanine Green Angiography for Intraoperative Evaluation of Microsurgical Flap Perfusion in Breast Reconstruction

**Introduction:**

Intraoperative monitoring of flap perfusion is key to prevent flap complications or failure. The standard imaging method for intraoperative flap perfusion assessment is the indocyanine green angiography (ICGA). Dynamic infrared thermography (DIRT) is a promising alternative modality that evaluates rewarming patterns after a cold challenge. Cold areas correlate with non-perfused areas, while hot spots correlate with perforators.

**Materials and Methods:**

Prospective study of thirty-eight deep inferior epigastric perforators (DIEP) flaps performed in 36 patients who were candidates for breast reconstruction from February 2020 to February 2021. The comparison between ICGA and DIRT was carried out in two steps during the surgery: (1) After complete flap dissection but before autonormization, and (2) after microvascular anastomosis. First, we evaluated flap perfusion with ICGA. Then, DIRT was performed applying cold challenge with a surgical tray at 22°C for 2 minutes. Thermography images were taken prior cold challenge, at first and third minutes after the cold challenge. Images were objectively compared, non-perfused areas evidenced with ICGA were calculated, and the temperature of perfused and non-perfused areas was determined by Flir Tools Program.

**Results:**

Non-perfused areas correlated with a temperature inferior to 26°C after cold challenge without rewarming even after 3 minutes in all cases ( $p=0.01$ ). The proportion of non-perfused areas observed with ICGA were calculated and compared with cold areas (less than 26°C) after the cold challenge ( $p=0.01$ ).

In two cases arterial failure occurred. No hot spots and no rewarming superior to 26°C were observed in none of the cases.

In two cases venous failure after anastomosis occurred. Thermography images showed rewarming superior to 26°C, but without hot spots.

**Conclusions:**

DIRT allows a non-invasive, reproducible, inexpensive, and objective evaluation of microsurgical flap perfusion. Information obtained by DIRT is comparable to information obtained by ICGA, being a valuable alternative tool to evaluate flap perfusion and diminish the risk of complications.

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**Abstract No.: 33**

**Category: Microsurgery**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Implementing the Robotic DIEP flap in daily practice: a series of 10 cases.

**Introduction:**

The DIEP flap is the workhorse in microvascular breast reconstruction. Rectus muscle sacrifice or denervation and inappropriate rectus sheath closure are main causes of abdominal wall morbidity. Robotic vessel dissection may limit fascial incision length below the arcuate line and rectus denervation. This study describes and focuses on the implementation and feasibility of this technique in daily surgical practice.

**Materials and Methods:**

A retrospective data collection of all robotic DIEP flap reconstructions between August 2020 and October 2021 was conducted at our university hospital. Primary outcome variables were flap success, conversion to open technique and perioperative complications. Secondary variables included timing of the different robot-assisted stages (installation, dissection and closure), total operating time and postoperative complications within 2 weeks.

**Results:**

In total 10, 9 delayed and 1 immediate, robotic DIEPs were performed by the same surgeon. Nine short intramuscular (SIM) and 1 subfascial (SF) perforators were selected based on preoperative imaging. In 2 cases a contralateral perforator was harvested because of perioperative findings to obtain a bilaterally pedicled unilateral flap.

No reconstructions required conversion to open surgery. There was 1 hematoma at the receptor site which required surgical drainage.

There were no perioperative intra-abdominal complications or flap losses.

Robotic installation ranges from 16 to 40 minutes (mean 27.5 minutes). Mean robot-assisted operating time was 86 minutes. The latter shows a decreasing trend over cases. Mean operative time was 479 minutes.

There were no major complications in the follow-up period.

**Conclusions:**

We present the largest case series of robotic DIEP flap reconstructions for delayed and immediate autologous breast reconstruction. This technique is safe, reproducible and feasible in a daily hospital setting. We have observed a steep learning curve associated to robotic vessel dissection. Future research may optimize surgical technique, assess possible benefit on abdominal wall morbidity and evaluate cost-effectiveness.

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**Abstract No.:** 172

**Category:** Microsurgery

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** The robotic DIEP - Early experience

**Introduction:**

The DIEP flap has had a remarkable impact on donor site morbidity in autologous breast reconstruction. To minimize the damage to the anterior rectus sheath and muscles, minimally invasive approaches to harvest the DIEP pedicles by laparoscopy was suggested. Most recently, robotic surgery has been proposed to simplify DIEP pedicle dissection.

**Materials and Methods:**

A total of 7 patients underwent robot-assisted DIEP (RA-DIEP) surgery at a single institution. After dissection of the flap and the perforator to the submuscular plane, a double port da Vinci system (Intuitive Surgical Inc., Sunnyvale, CA) was installed and two robotic arms were inserted for further pedicle dissection. Patient and flap characteristics, postoperative pain and the extra time required for RA-pedicle dissection and peritoneum repair were retrospectively recorded and compared to 28 conventional DIEP flaps performed in the same time frame.

**Results:**

All RA-DIEP flaps survived with only one minor wound healing complication. The incision of the anterior rectus sheath was significantly shorter in the RA-DIEP group ( $2.4 \pm 0.4$  cm) when compared to the conventional DIEP cohort ( $8.1 \pm 1.2$  cm,  $p<0.001$ ). The mean time for pedicle dissection was  $54.1 \pm 14.5$  min. Under the same pain control protocol as in conventional DIEP flaps, patients with RA-DIEP flap treatment reported a trend towards reduced donor site pain.

**Conclusions:**

Based on the early results, RA-DIEP is a safe and promising innovation with reduced donor site morbidity. The proposed operative setup of the da Vinci system may provide the harvest of bi-pedicled DIEP flaps without repositioning of the robot.

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**Abstract No.: 126**

**Category: Microsurgery**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Breast Flap Neurotization After Autologous Free Flap Breast Reconstruction: A Prospective Trial

**Introduction:**

Restoration of breast sensation is an important factor to consider following autologous breast reconstruction (ABR). Flap neurotization may result in improved sensation after ABR, but current literature regarding both patient-reported outcomes and quantitative sensation after neurotization is inadequate and heterogenous. We present a prospective trial investigating the long-term outcomes of flap neurotization regarding breast sensation.

**Materials and Methods:**

98 patients (n = 166 flaps) were prospectively evaluated for breast sensation and quality-of-life 1-5 years after ABR. This included 55 neurotized patients (n=97 neurotized breast flaps) and 44 non-neurotized patients (n=71 non-neurotized breast flaps). Evaluation consisted of the validated patient-reported questionnaire (BREAST-Q), a sensation-specific patient-reported questionnaire, and pressure-sensitive sensation testing at 9 locations on the breast using the AcroVal pressure-specified sensory device.

**Results:**

Non-neurotized patients were significantly more likely to report breast sensation was affecting their daily lives due to pain or discomfort, while neurotized patients were more likely to report they did not notice a difference in breast sensation after ABR or that the change in sensation was not affecting their daily lives ( $p= 0.035$ ). 2-5 years after ABR, neurotized patients were significantly more sensate at 4 of 9 testing locations on the breast ( $0.011 < p < 0.039$ ).

**Conclusions:**

Breast sensation affects the daily lives of breast reconstruction patients and is an important long-term outcome to consider following ABR. Neurotization is associated with improved protective sensation as well as reduced pain and discomfort in the long-term after ABR.

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**Abstract No.: 225**

**Category: Microsurgery**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** In Free Flap Autologous Breast Reconstruction Frailty Is a More Accurate Predictor of Postoperative Complications than Age, Body Mass Index, or ASA class: A Retrospective Cohort Analysis on the ACS-NSQIP Database

**Introduction:**

Free flap autologous breast reconstruction (f-ABR) improves quality of life in cancer survivors but has a 5-47% higher postoperative complication (PCs) rate in vulnerable patients, such as those with obesity or the elderly. Given the high (respectively: 43% and 16%) and rising prevalence of these conditions, operative risk prediction is critical to guide targeted care. Age, BMI, and ASA class have shown inaccuracies as predictive factors of PCs in f-ABR. Since frailty, a measure of vulnerability, was reported to be a reliable predictor of PCs in multiple

**Materials and Methods:**

Patients undergoing f-ABR (CPT: 19364) were identified using the ACS-NSQIP (American College of Surgeons-National Surgical Quality Improvement Program) database (01/2010-12/2018). Frailty was calculated using the validated modified Frailty Index (mFI). Rates of wound complications, bleeding episodes, readmissions, returns to operating room (ROR), and DVTs were compared across mFI score, BMI, age, and ASA class.

**Results:**

mFI ≥0.2 was associated with 22.22% ( $p <0.001$ ) wound complications; 15.79% ( $p <0.001$ ) bleeding episodes; 8.20% ( $p <0.001$ ) readmissions; 17.19% ( $p <0.001$ ) ROR; and 1.81% ( $p <0.05$ ) DVTs. Higher BMI, age, and ASA class did not significantly correlate with increased rates in one or more PCs. Only a high mFI was consistently associated with significantly higher odds of complications in all complication types.

**Conclusions:**

As a reliable and accurate predictor of PCs in f-ABR, frailty could be used preoperatively to counsel patients and guide surgical care.

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**Abstract No.: 102**

**Category: Microsurgery**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** The Impact of Breast Cancer Type, Staging, and Treatment on Free Flap Breast Reconstruction Complications

**Introduction:**

Patients with advanced cancer staging have a greater risk of developing venous thromboembolism (VTE) than no cancer alone. The impact of breast cancer staging and treatment on clinical outcomes after autologous free-flap breast reconstruction (ABR) is not well-established. The objective of this retrospective study is to determine the impact of breast cancer characteristics, such as cancer staging, hormone receptor status, and history of VTE, on vascular complications of ABR.

**Materials and Methods:**

A retrospective review was conducted examining patients who underwent ABR from 2009-2019. Breast cancer staging, types, hormone receptor status, and treatments were collected. Intraoperative and postoperative complications related to vascular compromise, including intraoperative congestion, postoperative take back for flap concern, and flap loss, were analyzed using chi-squared test.

**Results:**

1,615 patients underwent free-flap ABR during the study period and were included. Patients with estrogen receptor (ER) positive breast cancer have an increased risk of vascular complication compared to ER-negative cancer (6.0% vs. 2.6% for take back,  $p=0.033$ ; and 13.7% vs. 7.4% for overall vascular compromise,  $p=0.006$ ). Patients with human epidermal growth factor receptor 2 (HER2) negative breast cancer were more likely to have vascular compromise than HER2-positive (12.4% vs. 7.4%,  $p=0.035$ ). History of VTE was correlated with increased risk of postoperative flap loss (7.1% vs. 2.4%,  $p=0.039$ ). Breast cancer staging, progesterone receptor, triple-negative, and neoadjuvant treatment were not associated with ABR vascular complications.

**Conclusions:**

We found that ER-positive breast cancer, HER2-negative breast cancer, and history of VTE were independent risk factors for ABR vascular complications. Breast cancer stage and neoadjuvant treatments were not associated with increased free-flap vascular complications after ABR. Surgeons should factor breast cancer information into their clinical decision-making when recommending ABR to patients. Patients should feel confident that, despite higher stage cancer, they can pursue their desired reconstructive option without fear of vascular compromise.

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# SESSION 6

# RIGHT SURGERY



**Abstract No.: 291**

**Category: Microsurgery**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Free-Style (FS) algorithm vs CTA-guided perforator selection in DIEP flap harvest: a prospective clinical study.

**Introduction:**

Computed tomographic angiography (CTA) is the preferred diagnostic tool in preoperative DIEP flap assessment, though some surgeons prefer to approach perforator selection using intraoperative findings alone. We designed a prospective clinical study to compare operative times (OT) and complication rates (CR) between our intraoperatively decision-making algorithm the “Free-Style” (FS) algorithm and the CTA-guided approach. Secondary endpoints included the evaluation of agreement rate between the intraoperative findings and the CTA, and the identification of the variables affecting OT and CR.

**Materials and Methods:**

50 patients were enrolled for each of the study groups: Group A included patients who underwent DIEP flap using FS algorithm while Group B included patients who underwent CTA-guided perforators selection. Data collected were demographics, surgical information, agreement (AG) vs non-agreement (NAG) and CR.

**Results:**

The two groups of patients were homogenous in demographics. Operative time (OT) was statistically lower ( $p=0.036$ ) in SFS algorithm group (252.4 vs 265.6) and complication rates (CR) were higher ( $p=0.092$ ) in CTA-guided group (10% vs 2%). The overall agreement rate in dominant perforator selection between those selected intraoperatively and those on the CTA was 81%. Multiple regression analysis showed that no variable, including the NAG, increases CR. This result confirms that even changing the selections of perforator recommended by the CT scan does not necessarily lead to an increase in CR. Moreover, multiple regression analysis confirmed that other than increased BMI and harvest of more than one perforator, the CTA-guided approach statistically increases OT ( $p=0.023$ ). This proves that, given a learning curve, the use of CTA is not mandatory for a quicker and more reliable perforator selection.

**Conclusions:**

The FS algorithm proved to be a useful tool for guiding DIEP flap harvest with good sensibility in detecting the dominant perforator suggested by CTA without increasing statistically CR and OT.

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**Abstract No.:** 244

**Category:** Microsurgery

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Immediate unilateral DIEP Flap Breast Reconstruction following skin sparing mastectomy: a comparative study of a validated “flap inset algorithm” on reducing subsequent revision surgery

**Introduction:**

DIEP flap represents an ideal technique for autologous breast reconstruction. However, the number of revision surgeries is still high worldwide impacting on both patients and healthcare systems. A previous published “DIEP flap insetting algorithm” has proven to be effective in selecting patient-tailored strategies to achieve excellent aesthetic outcomes. This study investigates whether this “insetting algorithm” is effective in reducing revision surgeries in patients undergoing skin sparing mastectomy (SSM) and immediate DIEP flap breast reconstruction in order to ultimately achieve a one-stage reconstruction.

**Materials and Methods:**

This retrospective case-control study included 60 patients (group A) treated prior to introducing a standardized “insetting algorithm” and 60 patients (group B) treated with the standardized “insetting algorithm”. The two groups were otherwise homogeneous and introduction of the algorithm was the only significant variable. Demographic data, operative data, complications and number of surgeries were recorded. Statistical analysis was conducted to investigate any differences between the two groups.

**Results:**

120 primary and 72 revision surgeries were performed. Groups were homogenous for age, BMI, flap weight, operative time and early complications. When excluding isolated nipple reconstruction from revision surgeries, one-stage reconstruction was successfully performed in 26 patients belonging to group A (43.3%) and 39 patients (65.0%) in group B, with a statistically significant difference between the groups ( $p=0.003$ ).

**Conclusions:**

The introduction of a “standardized insetting algorithm” for immediate unilateral DIEP flap breast reconstruction can be effective in reducing the number of revision surgeries, making a one-stage free flap reconstruction an achievable and reliable target.

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**Abstract No.:** 266

**Category:** Microsurgery

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** The abdominoplasty breast reconstruction: Ensuring abdominal wellbeing in DIEaP flap reconstructive surgery

**Introduction:**

The abdomen is the most frequented donor site for autologous breast reconstruction, where tissue transfer is based on the Deep Inferior Epigastric artery perforator vessels. In order to improve abdominal wellbeing after flap harvesting, surgical strategies were adapted from the methods known to enhance outcomes in abdominoplasty surgery.

**Materials and Methods:**

Postoperative abdominal wellbeing was compared between abdominoplasty patients and DIEaP flap breast reconstruction patients by means of the Breast-Q and Body-Q questionnaires. Patients were asked to fill in the sections regarding the abdomen before and one year after their surgery. The questionnaire outcomes were statistically analyzed for both within group as between group differences.

**Results:**

Thirty-one DIEaP flap patients and 29 abdominoplasty patients were included in this study. General satisfaction regarding the abdomen and sexual well-being was significantly increased in both groups and postoperative scores were comparable in both groups ( $P>0,05$ ). Physical well-being regarding the abdomen did decrease in the DIEaP flap group, while it increased in the abdominoplasty group.

**Conclusions:**

Patients reported an equal satisfaction score regarding the abdomen after DIEaP flap surgery as seen in abdominoplasty patients. Surgical steps that improve surgical outcome and patient satisfaction at the donor site in autologous breast reconstruction contribute to the general outcome and quality of life of patients.

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**Abstract No.: 203**

**Category:** Microsurgery

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Combined DIEP flap and Lymphatic System Transfer for upper limb lymphedema and breast reconstruction: the role of US-based planning

**Introduction:**

Autologous breast reconstruction with free abdominal perforator flaps is the gold standard. For patient with upper extremity lymphedema, DIEP flap can be transferred with vascularized inguinal node/afferent lymphatics in order to restore the breast and improve limb lymphatic function in a single operation. However, patients may strongly differ for reconstructive needs and microvascular anatomy of both the abdominal perforators and the inguinal regions. Therefore, the surgical planning of the combined DIEP flap and Lymphatic System Transfer may vary between the different microvascular constructs, and imaging plays a fundamental role in this choice.

In this paper, we report our experience with CT-angio coupled with ultrasound (US)-based preoperative planning to optimize this surgery in each patient and transfer these flaps safely and effectively.

**Materials and Methods:**

From January 2014 to January 2021 32 patients with secondary upper limb lymphedema needing autologous breast reconstruction underwent the combined DIEP flap and Lymphatic System Transfer according to the angioCT and US information in particular regarding the microvascular anatomy of the groin region, in terms of location, size, number and hylum of the lymph nodes, and their nourishing vessels (SIEA+V or SCIA+V).

Reverse mapping was undertaken to avoid lower extremity iatrogenic lymphedema. Postoperative results were evaluated at 3, 6, 12 and 24-month follow-up by means of quantitative (circumference and lymphedema related signs and symptoms), qualitative (lymphoscintigraphy) and quality of life questionnaire (LymQoL).

**Results:**

All patients reported quantitative, qualitative and QoL improvement. No lower limb lymphedema was experienced. Perioperative and postoperative physical treatments boosted the surgical treatments.

**Conclusions:**

All patients reported quantitative, qualitative and QoL improvement. No lower limb lymphedema was experienced. Perioperative and postoperative physical treatments boosted the surgical treatments.

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**Abstract No.:** 148

**Category:** Clinical PRS General

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Long-term results after 148 Total Breast Reconstructions with the Fat-Augmented Latissimus Dorsi (FALD) flap.

**Introduction:**

Latissimus dorsi (LD) is a workhorse pedicled flap for breast reconstruction (BR), either with an implant or harvested as an extended flap. We present a step-by-step guide to our original Fat-Augmented LD (FALD) flap technique and long-term results.

**Materials and Methods:**

Between December 2010 and November 2019, 100 patients underwent 148 FALD-based BR. Candidates were patients with small-to-moderate sized breasts, with a contraindication for free-flap based BR (inadequate donor site abdominal tissues etc.) and/or who refused other types of autologous or implant-based reconstructions. The exclusion criteria were the following: athletic women who use back muscles for climbing or rowing related activities, and paraplegic women. Demographics, clinical and surgical data were analyzed and an aesthetic analysis was performed. Statistical analysis was performed with the Kruskal-Wallis H test and the Cohen's Kappa test was used to test inter-rater variability for the aesthetic analysis.

**Results:**

Average operative time was 193.5 minutes (range 130 to 360) for unilateral and 290.6 (range 180 to 376) for bilateral procedures. Mean immediate autologous fat transfer (AFT) volume was 105.3 cc (range 60 to 170) per breast. Mean follow-up was 59.3 months. Major complication (total or partial flap necrosis > 30%) rate was 0% and minor complication (partial flap necrosis < 30%, fat necrosis hematoma, seroma, donor site dehiscence, chronic pain) rate was 6.76%. Aesthetic analysis showed satisfactory results after all type of mastectomies. In the variables regarding skin texture ( $p=0.001$ ), scar location ( $p=0.005$ ) and total score ( $p=0.001$ ), patients undergoing MRM scored lower compared to SSM, NSM.

**Conclusions:**

After our preliminary report, with a broader population and a longer follow-up, we were able to confirm the FALD flap as a reliable option for total autologous BR. It continues to represent a valid alternative to other autologous techniques, achieving high levels of patient satisfaction with very competitive cosmetic results.

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**Abstract No.: 229**

**Category: Microsurgery**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Breast reconstruction using the Profunda Artery Perforator (PAP) flap: Evaluation of Patient Reported Outcomes Measures following 116 Consecutive Flaps

**Introduction:**

The Profunda Artery Perforator (PAP) flap can be a good alternative for autologous breast reconstruction when the Deep Inferior Epigastric Artery (DIEP) flap is unavailable. The PAP flap is gaining popularity worldwide; however, it is still not seen as the first-choice option when the DIEP flap is unavailable. We report our experience with 116 consecutive PAP flaps detailing both surgical and patient reported outcomes. We also detail the evolution of our technique in using the PAP flap as the second-choice free flap for breast reconstruction.

**Materials and Methods:**

We prospectively collected data from patients undergoing breast reconstruction with a PAP flap between 2016 and 2019. Patient demographics, reconstructive timing, operative details, complications and surgical outcomes were all recorded. The BREAST-Q questionnaire was carried out prior to surgery and again at 12 months post-operatively as well as a specific questionnaire to evaluate the donor site at the thigh. All data was analysed using Microsoft Excel and statistical analysis was performed using Stata 12.0.

**Results:**

116 PAP flaps were performed for 86 patients who underwent breast reconstruction (83 immediate, 25 delayed). Patient demographics included mean age of 46yrs with a mean BMI of 24. Flap demographics included 56 unilateral, 8 stacked and 22 bilateral PAP flaps. The mean flap weight was 251g. 100% flap survival was recorded. Complications included donor site haematoma (1.7%), seroma (2.6%), fat necrosis (1.7%) and wound dehiscence (2.6%). Patients reported higher postoperative scores than preoperative scores in all BREAST-Q domains. Scores were statistically significant in the “Satisfaction with Breast” domain ( $p= 0.0016$ ).

**Conclusions:**

This series demonstrates that PAP flap breast reconstruction results in good patient satisfaction, acceptable clinical outcomes and low complication rates. We feel it should be considered the first line choice for autologous breast reconstruction when DIEP flap is unavailable.

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**Abstract No.: 174**

**Category:** Clinical PRS General

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Nipple Sparing Skin Reducing Mastectomy: the Wide Base Bipedicled (WiBB) flap and our reconstructive algorythm

**Introduction:**

Nipple sparing skin reducing mastectomy (NS/SRM) allows oncological radicality but implies more complexities in planning and performing the procedure with regards to the location and quantity of the skin to be excised and the viability of the nipple areola complex and mastectomy flap. Also, it doesn't easily suit to very large and ptotic breasts.

We present a new surgical approach and algorithm to the NS/SRM technique in which the mastopexy design for skin reducing is carried out by a Wide base bipedicled flap (WiBB Flap). The WiBB flap can be used both in the immediate reconstruction with implants and ADM or microsurgical autologous flaps and in delayed reconstruction with expanders.

**Materials and Methods:**

We prospectively applied our protocol in 51 patients (71 Breast) from june 2015 to december 2021. Data on patients, surgery (mastectomy prophylactic/therapeutic, type and timing of reconstruction), complications (skin mastectomy flaps or NAC necrosis, flap failure, implant exposure, infection, wound dehiscence, capsular contracture) and length of follow-up were extrapolated and analyzed.

**Results:**

Complication rate was low and lower compared to our previous experience with NS/SRM and with the literature; we observed only one major complication (1.4 %) consisting in periprosthetic infection requiring implant removal; minor complications occurred in 14.1% of cases (six minor skin necrosis and two partial NAC necrosis healed by secondary intention, two periprosthetic fluid collections managed with simple drainage).

**Conclusions:**

The WiBB flap and our reconstructive algorithm are a valid mastopexys approach for both autologous/prosthetic reconstruction following NS-SRM in medium large ptotic breast. The WiBB flap provides improved NAC vascular supply and further implant coverage at the T-junction, avoiding major complications such as necrosis of the nipple areola complex or exposure of the implant, ensuring at the same time oncological safety and a good cosmetic result.

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**Abstract No.:** 204

**Category:** Clinical PRS General

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Prepectoral breast reconstruction: an ideal approach to bilateral risk-reducing mastectomy

**Introduction:**

Bilateral risk-reducing mastectomy (BRRM) has increased its popularity in the last years because of its aim to minimise the chances of developing breast cancer in high-risk patients. Women undergoing this procedure must be considered highly demanding patients given the need to combine aesthetical, functional and preventive desires. This study aims to present the authors' experience in performing BRRM followed by single-stage prepectoral reconstruction (PPBR) with implant completely covered by acellular dermal matrix (ADM) and to report indications, surgical techniques, functional and aesthetic results.

**Materials and Methods:**

A single-centre prospective data collection was carried out from January 2017 to January 2021 of patients at high risk of developing breast cancer undergoing BRRM and immediate PPBR with ADM. Patients were subdivided into two groups according to the breast shape: Group A had small and medium size breasts and Group B had large and ptotic breasts. Oncological and surgical outcomes were collected. Satisfaction with reconstruction and related quality of life were evaluated through the BREAST-Q questionnaire.

**Results:**

A total of twenty-three patients met the inclusion criteria. Seventeen patients were included in group A and six patients in group B. Average follow-up was 18.4 months. Minor complications occurred in four breasts: one seroma, one hematoma and two cases of wound dehiscence. Capsular contracture was not observed. All patients were satisfied with the final result according to the post-operative BREAST-Q questionnaire.

**Conclusions:**

Immediate prepectoral breast reconstruction could represent the ideal reconstruction option after BRRM and should be offered to all women that fulfil the inclusion criteria.

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**Abstract No.:** 231

**Category:** Clinical PRS General

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Reconstructive outcomes in breast sarcoma - a population-based cohort

**Introduction:**

There is little consensus on breast reconstruction after surgery for sarcoma or phyllodes tumour of the breast. The purpose of this study was to examine the role of the reconstructive plastic surgeon in this patient group, and to describe breast reconstruction rates, techniques, and outcomes in a population-based cohort.

**Materials and Methods:**

We performed a retrospective cohort study of all patients with a sarcoma or phyllodes tumor of the breast between 1999 and 2018 in the Stockholm region. Information on patient and tumor characteristics, and management, were collected from medical records.

**Results:**

We identified a total of 238 patients; 32 with sarcoma and 136 with benign phyllodes tumor, 47 with borderline phyllodes tumor, and 23 with malignant phyllodes tumor. Median age at presentation was 46 years. A total of 47 patients (19.7%) underwent mastectomy, of whom 18 (38.3%) underwent breast reconstruction. A majority (12) of reconstructions were flap-based, and 6 were implant-based. A contralateral symmetrising procedure was performed in 16 patients. Four patients required reconstructive surgery for tissue coverage, which included local tissue transfer and/or skin grafting. Recurrence occurred (local or distant) in 15 (31.9%) mastectomy patients and in 6 out of 18 (33.3%) reconstructed patients.

**Conclusions:**

Mastectomy is a relatively common procedure to treat sarcomas and phyllodes tumours of the breast, however, despite a low median age, only 38.3 % of patients in this group undergo breast reconstruction. The reconstructive plastic surgeon plays an important role to this patient group, both for options of breast reconstruction, and for achieving tissue coverage in large resections.

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**Abstract No.: 179**

**Category: Microsurgery**

**Time: 4**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** The evolution of ERAS pathway in Breast Reconstruction in North Bristol NHS Trust

**Introduction:**

Autologous breast reconstruction has faced a challenging time during COVID 19 pandemic and the pressure on the health care system has been high, to ensure all patients are offered all the reconstructive options after mastectomy, as per NICE guidelines.

In North Bristol NHS Trust we managed to continue the breast reconstruction service after the first lockdown and we evolved the Enhanced Recovery After Surgery (ERAS) pathway implemented in our Unit in 2017 from 4 to 3 days of inpatient stay.

**Materials and Methods:**

We conducted a retrospective study examining all patients receiving a DIEP reconstruction from 2016 to 2021 in our Unit.

We collected data regarding the timing of the flap (immediate or delayed), the return to theatre, the failure rate and the complication rate, and the relation to the length of stay.

**Results:**

We performed a total of 516 DIEP flaps on 449 patients, of which 382 unilateral and 67 bilateral.

From the start of the pandemic (2020) most of cases were immediate or risk reducing.

Our failure rate is 1.16 % in total, with 3 failed flaps in 2017, and 1 in 2018, 2019, and 2020.

Our average length of stay was 5 days in 2016, 3.4 in 2019 and 3.1 in 2020 and 2021.

Our return to theatre within 30 days from surgery is 4.4 % (n= 20/449) both within the first week, for microsurgical complications or later, for wound dehiscence, skin envelope necrosis or fat necrosis.

**Conclusions:**

The evolution of the ERAS pathway in the breast reconstructive service in North Bristol NHS Trust has proven to be effective and safe even in the time of a world pandemic. This is supported by strong results in terms of complication rate and patients satisfaction.

We recommend the adoption of ERAS pathway to ensure high standard of care to breast patients.

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**Abstract No.: 97**

**Category: Microsurgery**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Long term results of a standardized enhanced recovery protocol in unilateral, secondary autologous breast reconstructions using an abdominal free flap

**Introduction:**

In 2015 we published one of the first reports using an enhanced recovery protocol (ERP) in microsurgery and in 2016 our final ERP set up in autologous breast reconstruction (ABR) using free abdominal flaps. We showed that by adhering to a few simple, easy to measure, functional discharge criteria, it was possible to safely discharge the patients by the 3rd postoperative day (POD). However, one of the challenges of interpreting studies using ERP in ABR is the often heterogenous patient populations and the need to clearly distinguish between primary and secondary and unilateral and bilateral reconstructions.

**Materials and Methods:**

In the 5-year period from 2016 to 2020, the same surgical team, performed 147 unilateral, delayed breast reconstructions (135 DIEP, 9 MS-TRAM-2 and 3 SIEA flaps) according to our previous analgesic protocol and surgical strategy. Data was collected prospectively.

**Results:**

Three flaps were lost (2%) and 82% of the patients(n=128) were discharged to home by POD 2 (n=8%) or 3 (74%). The remaining 18% (n=26) were discharged by POD 4 (12.5%) or 5 (5.5%). 10 patients (7%) were reoperated and 17 patients (12%) had minor complications within POD 30 (infection, seroma etc.) that did not necessitate hospital admission.

**Conclusions:**

Using our ERP, unproblematic discharge directly to home is possible on POD 3 in more than 80% of patients after ABR. ERP is no longer a research tool but considered standard of care in microsurgical breast reconstruction.

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**Abstract No.:** 151

**Category:** Clinical PRS General

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Effects of Delayed Breast Reconstruction on the Thoracolumbar Vertebrae in Patients Undergoing Unilateral Mastectomy, A retrospective cohort study

**Introduction:**

Post-mastectomy changes affect vertebral column alignment. There is limited data assessing spine curvature after breast reconstruction. In this study, the effects of delayed breast reconstruction on the Cobb angle and quality-of-life indicator (Oswestry Disability Index [ODI]) were evaluated in patients undergoing unilateral mastectomy.

**Materials and Methods:**

This study was performed as a retrospective review of 40 patients who had delayed reconstruction for breast cancer at a single center between 2015 and 2018. Patients completed a standardized questionnaire, the ODI, at the beginning, 6 months and 12 months after the operation. The Cobb angles of the vertebral columns and spinal curve directions were determined using posteroanterior chest radiographs obtained pre and postoperatively. The patient demographics (age, height, weight, body mass index [BMI]) and information regarding the side of surgery and excised tissue volume during mastectomy were obtained from the hospital database. Changes in Cobb angle were compared using the Wilcoxon test. The Spearman test was used to evaluate the relationship between ODI score and the change in Cobb angle.

**Results:**

The Cobb angles were found to differ before and after the reconstruction, the difference was statistically significant, and the average change in Cobb angle was 4.3 degrees ( $p=0.03$ ). The Cobb angles were also found to be significantly different between patients with implants and those who underwent autologous tissue reconstruction ( $p=0.026$ ). Although delayed reconstruction performed with autologous tissue or implant improves post-mastectomy scoliosis, autologous tissue reconstruction yields better outcomes. The mean preoperative ODI score was 21.6%, and 8.8% presented no back pain. The mean score was 3.2% at 12 months post operation. These results are statistically significant ( $p<0.001$ ).

**Conclusions:**

Breast reconstruction positively affects vertebral alignment and leads to better posture, physical function and decreased back pain in breast cancer survivors, significantly improving their quality of life.

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# SESSION 7

# EXTREMITIES, NERVE & LYMPHATICS



**Abstract No.:** 119

**Category:** Hand/Nerve/Extremities

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Patient Reported Hand Function to predict surgical treatment for Dupuytren's disease

**Introduction:**

Web-based monitoring systems are logically and economically appealing. Patient-reported outcome measures (PROMs) could aid surgeons to assess the need for clinical evaluation and subsequent treatment of patients with Dupuytren's disease (DD). We investigated the predictive ability of patient-reported hand function for surgical treatment of DD.

**Materials and Methods:**

This study was a prospective cohort study based on data of clinical and subclinical DD patients. Since 2012, patients completed the Unité de Rhumatologique des affections de la Main (URAM) and/or the Michigan Hand Questionnaire (MHQ) at each annual visit. We compared treated patients with untreated patients, and used these scores to predict treatment for DD. For the treatment group, we selected an MHQ and URAM score within 15 months before surgery. Additionally, we calculated the one-year change in MHQ and URAM score prior to surgery (&#916;MHQ and &#916;URAM). For the control group, we calculated these scores using two randomly selected study visits. The primary outcome measure was surgical treatment for DD.

**Results:**

We included 133 hands of 111 patients for the MHQ analysis and 148 hands of 122 patients for the URAM analysis. The one-year &#916;URAM score and &#916;MHQ score showed an area under the curve (AUC) of 0.560 (95% CI 0.404-0.715) and 0.565 (95% CI 0.459-0.676), respectively. The AUC of the total URAM and MHQ scores were 0.75 (95% CI 0.66-0.83) and 0.79 (95% CI 0.695-0.878) respectively, corresponding with an optimal total cut-off value of 2.5 points (URAM) and 91 points (MHQ). The likelihood ratio for the URAM score was 2.12, and 2.17 for the MHQ.

**Conclusions:**

Patients with an MHQ score of &#8804;91 points and a URAM score of &#8805;2.5 points are two times more likely to receive surgical treatment within the next 15 months. MHQ and URAM scores could be useful for web-based monitoring of DD patients to aid clinical decision-making.

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**Abstract No.:** 136

**Category:** Hand/Nerve/Extremities

**Time:** 4

**CR:** Yes

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Designing and utilizing 3D-printed skin incision guides during the first Dutch bilateral hand-arm transplantation

**Introduction:**

A bilateral hand-arm transplantation has been performed for the first time in the Netherlands in 2019. In the context of preparation for this surgical procedure, the optimal patient-specific skin flap was determined. Skin flaps should be properly matched between donor and recipient to ensure sufficient tissue for the approximation of skin over the tendon anastomosis, adequate distal tip perfusion, and esthetics. Preoperatively, stereophotogrammetry was obtained from the upper extremities of the patient and a volunteer with similar body physique. Skin flap dimensions were determined for each extremity, which resulted in patient-specific incision patterns. Combining this digital information yielded practical skin incision guides for both the donor and acceptor arms. Finally, the computer-aided designs were 3D printed.

**Case Report:**

Our patient was a highly motivated and physically strong 44-year-old, who suffered severe sepsis in 2014. She developed acute kidney failure and diffuse intravascular coagulation and required amputation of both legs below the knee; her left hand was at the radiocarpal level and her dominant right hand was at the metacarpal level due to necrosis. She recovered well with the restoration of her kidney function.

**Conclusions:**

Three-dimensional printed templates were successfully utilized in the first Dutch bilateral hand-arm transplantation. The 3D prints were convenient to utilize in both shaping the donor flaps as in preparing the acceptor extremities, taking only a few seconds during precious ischemia time. There was sufficient skin flap perfusion, and the wound-healing followed an uncomplicated course. No corrections were made to the initial skin incisions.

We believe its usage increased time efficiency, improved the match of skin flaps in donor and recipient arms, and allowed us to control the amount of skin surplus without skin flap tip necrosis. In these procedures where time is of the essence, we believe preoperative planning is imperative for its success.

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**Abstract No.:** 263

**Category:** Hand/Nerve/Extremities

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Percutaneous Tenolysis with Fat Grafting: A Novel Minimally Invasive Procedure

### **Introduction:**

Stiffness with loss of motion represents the Achilles heel of hand surgery. Pathology such as tendon lacerations, fractures, and crush injuries may be accurately managed operatively but return to preinjury status may not occur despite dedicated postoperative hand therapy. Tenolysis is one modality that addresses stiffness by mechanically disrupting scar tissue formed around tendons. We describe our experience with a novel technique using minimally invasive percutaneous approaches and fat grafting. Fat grafting provides a gliding tendon surface, reduces scar formation and optimizes wound conditions.

### **Materials and Methods:**

All patients are awake under local anesthesia and able to activate their forearm muscles. Through a palmar puncture, we percutaneously advance along the fibro-tendinous canal a spatulated freer-like fat grafting cannula to mechanically free the adhesions while dilating the tissues by delivering a tumescent lipoaspirate. Afterwards, with "L" shaped 18G needles percutaneously introduced laterally, just palmar to the phalanx, we perform windshield-wiper arcuate motions that sharply separate the skeletal-tendons adhesions while protecting the integrity of the pulleys. incisions are minimal, postoperative therapy is initiated at day three and patients followed for a minimum of 6 months.

### **Results:**

102 digits were tenolysed on 68patients over 4years. Mean operative duration was 48minutes, average infiltration measured 10-ml per digit. Measured total active motion (TAM) was less than 75% before surgery and all achieved 75% TAM or greater, postoperative. Pain scores improved by >33% and 66/68 patients stated they would perform the procedure again. Postoperative complications included 2 tendon ruptures, 12 superficial wounds/infections, and donor site pain in 2 patients.

### **Conclusions:**

Our experience demonstrates the efficacy of a novel technique using both a minimally invasive approach and fat grafting to improve outcomes in patients with stiff hands and fingers.

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**Abstract No.:** 254

**Category:** Hand/Nerve/Extremities

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Cognitive nerve transfers for restoration of volitional hand control in stroke patients.

### **Introduction:**

Stroke is nowadays a leading cause of disability with devastating sequelae. Upper limb spasticity is one of them. Nevertheless, not all the muscles are equally affected, as some may turn spastic or paretic and other remain intact. This unique pathophysiological mosaic dictates a precise therapeutic plan. Existing spasticity treatment has significant drawbacks due to its unspecific targeting and short duration. A causal, life-lasting treatment, precisely adapted to disease pattern, is currently missing. Selective muscle denervation and subsequent cognitive reinnervation with appropriate unaffected donor nerves may break the pathological spastic circuit and provide volitional muscle control. We performed cognitive nerve transfers to spastic muscles of stroke patients and prospectively investigated their effects on clinical and functional level.

### **Materials and Methods:**

To provide volitional muscle control of finger flexors and wrist/fingers extensors we transferred the branch to brachialis muscle to the anterior interosseous nerve and the branch to the lateral head of triceps to the posterior interosseous nerve in a total of four hemiplegic patients. As spastic forearm pronation was always present, we additionally cognitively reinnervated the pronator teres muscle with a branch to the pectoralis major muscle using a nerve graft. Nerve donors had been always carefully selected, provided they could be volitionally recruited and de-recruited and had a minimum M4 strength. Clinical and functional outcomes are evaluated 6 and 12 months after surgery.

### **Results:**

At 6-month follow-up, all patients had improved DASH and CAHAI scores and modified Ashworth scale revealed no abnormality in muscle tone and resistance to passive stretch. Muscle activity of the reinnervated muscles could be observed only electrophysiologically with surface electromyography. The 12-month follow-up is still pending.

### **Conclusions:**

Cognitive muscle reinnervation through selective nerve transfers represents a novel concept for treatment of post-stroke spasticity, provides regain of volitional muscle control and offers the possibility for permanent biological restoration of hand function.

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**Abstract No.: 31**

**Category: Microsurgery**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Multiple Nerve Transfers Develop Distinct Innervation Territories within a Single Target Muscle

**Introduction:**

Muscles are effective amplifiers of neural information. In recent years we have demonstrated the feasibility of human interfacing with myoelectric devices via “Bio-Screens”. This is accomplished by reconnecting nerves which have lost their target after an amputation to new targets (targeted muscle reinnervation). However, the true potential of current neuroprosthetics is greatly limited by existing technologies for neuromuscular interfacing. Here we present a novel procedure by transferring multiple nerves onto a single target muscle to improve neuronal signal extraction and thus prosthetic control in a rat model.

**Materials and Methods:**

The distal branch of the ulnar nerve alone ( $n=31$ ) or together with the anterior interosseous nerve ( $n=37$ ) were transferred to reinnervate the long head of the biceps in Sprague-Dawley rats. After twelve weeks of regeneration, we analyzed muscle function using newly developed multi-channel EMG-electrodes. Structural reinnervation analyses included sequential retrograde tracing, muscle fiber typing and whole-mount muscle staining.

**Results:**

Sequential retrograde labeling revealed relative innervation proportions of the two nerves. Furthermore, motor unit action potentials from double reinnervated muscles were recorded with excellent signal-to-noise ratio and provide evidence of distinct innervation territories. Lastly, the donor nerves significantly changed the target muscle fiber type population.

**Conclusions:**

These results demonstrate that multiple nerves transferred to a single muscle form topographically distinct compartments that can be activated independently. This approach of a polytopic neural matrix has the potential to display the neural code of the entire motoneuronal population of an amputated limb. High density EMG pick-up electrodes and adequate signal processing can decipher the neural code and be used for high-fidelity prosthetic control.

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**Abstract No.:** 208

**Category:** Microsurgery

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Recipient Venule selection and Anastomosis Configuration for Lymphaticovenular Anastomosis in Extremity Lymphedema: Algorithm based on 1000 LVAs.

**Introduction:**

The L-V-A has three components (Lymphatics, Venules and Anastomosis), and all of them influence the anastomotic pressure gradient. Although it has been demonstrated that venule flow dynamics has an independent impact on the outcomes regardless the degeneration status of lymphatic vessels, recipient venules (RV) have been mainly neglected in literature.

**Materials and Methods:**

From January 2016 to February 2020, 232 non consecutive patients affected by extremity lymphedema underwent LVA, for a total of 1000 LVAs. Only patients with normal-to-ectasic lymphatic collectors were included to focus the evaluation on the RV only. The preoperative collected data included the location, diameter and continence of the selected venules, the expected number, the anastomoses configuration and their flow dynamics according to BSO classification.

**Results:**

The 232 patients included 117 upper limb lymphedema (ULL) and 115 lower limb lymphedema (LLL). The average size of RV was  $0,81 \pm 0,32$  mm in end-to-end (E-E),  $114 \pm 0,17$  mm in end-to-side (E-S),  $0,39 \pm 0,22$  mm in side-to-end (S-E) and  $0,76 \pm 0,38$  mm in side-to-side (S-S). According to the BSO classification, on a total of 732 RV, 105(14%) were Backflow venules, 136(19%) Slack and 491(67%) Outlet venules. 824 (82%) were E-E, 107 (11%) were E-S, 51 (5%) were S-E and 18 (2%) were S-S anastomosis.

**Conclusions:**

Based on 1000 LVAs with similar lymphatic characteristics, we propose our algorithm that may aid the lymphatic microsurgeon in the selection of RV and the consequent anastomosis configuration, in order of obtain the best flow dynamic through the LVA.

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**Abstract No.: 227**

**Category: Microsurgery**

**Time: 4**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** A PROSPECTIVE STUDY ON THE USE OF A COMBINED TREATMENT FOR LYMPHEDEMA PATIENTS

**Introduction:**

The increased interest raised by the introduction of reconstructive procedures in lymphedema treatment is still affected by the need of further exploration into standardized protocols. Aim of this prospective study is to evaluate the effectiveness of the combination of vascularized lymph node transfer (VLNT) and suction-assisted lipectomy (SAL) in a standardized approach to lymphedema patients.

**Materials and Methods:**

Between January 2016 and May 2019, 83 patients with lower limb lymphedema were enrolled. Patients were affected by stage IIb-III lymphedema, according to the International Society of Lymphology, with lack of benefit from complex decongestive therapy. Surgical treatment comprised gastroepiploic VLNT followed, approximately two weeks later, by SAL. Patients were prospectively evaluated through circumference measurement and clinical examination, including number of episodes of cellulitis.

**Results:**

83 patients affected by lower limb lymphedema (LLL) were enrolled in this study. Average follow-up was  $3 \pm 0.8$  years. The mean circumference reduction rates (CRR) were 60.4, 56.9, 29.6, and 55.4 % above and below the knee, above the ankle, and at the foot level, respectively. A statistically significant difference was noted at all the levels ( $p<0.05$ ), but above the ankle ( $p=0.059$ ). The number of episodes of cellulitis dropped significantly ( $p < 0.05$ ).

**Conclusions:**

This study investigates the use of a combined approach comprising gastroepiploic VLNT and SAL in patients affected by stage IIb-III lymphedema of the lower limbs. Due to the encouraging results, an extensive application of combined techniques in the clinical practice may be investigated.

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**Abstract No.: 43**

**Category: Microsurgery**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Microsurgical reconstruction for lesions of the peripheral and central lymphatic system in children

**Introduction:**

Abnormalities of the lymphatic system, e.g. congenital lymphedema or thoracic duct pathologies may be present at birth or develop later in life. To date, there is no cure and the mainstay of management is conservative therapy. However, lymphatic surgery is rarely performed in children today. .

**Materials and Methods:**

We established a multi-disciplinary cooperation between the University Hospital Zurich and the Children's Hospital Zurich to introduce microsurgical reconstruction for lymphedema and lesions of the lymphatic system in the pediatric population.

**Results:**

In a multidisciplinary team we treated a 7-year-old girl with primary lymphedema and incomplete situs inversus by vascularized lymph node transfer from the greater omentum, which was harvested laparoscopically. The girl showed a softening of the tissue, limb reduction and reduction of compression at 6 months postoperatively. A 14-year old boy with primary lymphedema of the legs and scrotal/penile edema was treated by bilateral lymph node transfer from the greater omentum to the groin and additional lympho-venous anastomoses of the scrotum with significant reduction of the genital edema. A 6-month old girl suffered from severe chylothorax and -ascites as well as a generalized massive lymphedema with anasarca of the whole body due to extensive thromboses of the jugular, subclavian and superior cava veins. Lympho-venous anastomosis of the thoracic duct was performed in the neck with stabilization of protein loss, improvement of pulmonary function and visible reduction of anasarca. However, the child passed away later in the course due to hemorrhage after catheter thrombolysis.

**Conclusions:**

In our new multidisciplinary approach to treat children with lymphatic anomalies, we aim to optimize accurate diagnosis including clinical, radiological and genetic investigations to establish state of the art conservative treatment and early identification of patients who may benefit from microsurgical therapy before aggravation of their otherwise chronic and severe disease.

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**Abstract No.:** 104

**Category:** Hand/Nerve/Extremities

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Chimeric gastrocnemius muscle-medial sural artery perforator (GM-MSAP) flap versus gastrocnemius muscle (GM) flap in complex orthoplasty reconstructions of the knee

#### **Introduction:**

Implant-associated infection of the knee and upper third of the leg often require multiple re-intervention and represent a real limb-threatening complication.

Gastrocnemius muscle (GM) is the workhorse flap to reconstruct soft tissue defects in the knee and upper leg area. However, chimeric principles and perforator/propeller flaps recently opened new tailoring possibilities in complex knee reconstructions. This work compares the chimeric GM-MSAP (medial sural artery perforator) flaps and the traditional GM pedicled flap in specifically complex orthoplastic scenarios, where TKA replantation following infection or multiple-stage surgeries due to chronic osteomyelitis were necessary, with limited skin availability and complex infectious conditions.

#### **Materials and Methods:**

A retrospective study was conducted on a prospectively maintained database from January 2016 to February 2021. Inclusion criteria involved all patients who underwent an implant-associated infection of the knee and upper third of the leg coupled with a soft tissue reconstruction (STR) using a pedicled GM flap or a GM-MSAP flap.

#### **Results:**

38 patients were included (GM flap, 22 patients; chimeric GM-MSAP flap, 16 patients). No statistically significant differences were detected in terms of age, comorbidities, defect size and follow-up. Similarly, the incidence of flap complications was superimposable among the groups. A statistically significant difference was seen among the groups in terms of successful flap re-raise (required because of a persistent infection of the implant or in a two-stage procedure setting, including the use of a cemented spacer) in favour of the GM-MSAP group.

#### **Conclusions:**

The chimeric GM-MSAP flap can be a powerful tool in those cases in which a two-stage procedure is planned or when there is a high probability for secondary intervention. The skin paddle of the flap guarantees a more reliable cicatrisation process, does not incur into shrinkage, and allows for easier flap-re-raise. This flap modification could significantly decrease complications, improving the rate of final reconstructive outcome

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**Abstract No.:** 261

**Category:** Microsurgery

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Muscle vs Fasciocutaneous microvascular free flaps for lower limb reconstruction: a meta-analysis of comparative studies

**Introduction:**

Lower extremity microvascular reconstruction for complex soft tissue defects aims at restoring function and preventing infection while ensuring optimal cosmetic outcomes. Muscle (M) or Fasciocutaneous (FC) microvascular free flaps are alternatively used to treat similar conditions. However, it is unclear whether one of these two options might be considered superior in terms of clinical outcomes. We performed a meta-analysis of studies comparing M and FC flaps to evaluate this issue.

**Materials and Methods:**

The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines were followed to perform a systematic search of English literature. We included all articles comparing M and FC flap reconstructions for large lower limb soft tissue defects following trauma, infection or tumor resection. We considered as primary outcomes flap loss, postoperative infection and donor site morbidity. Secondary outcomes included minor recipient site complications and need for revision surgery.

**Results:**

A total of 10 articles involving 1340 patients receiving 1346 flaps were retrieved, corresponding to 782 (57%) M flaps and 564 (43%) FC flaps. The size of the studies included ranged from 39 to 518 patients. The most commonly used M flaps were Latissimus Dorsi, Gracilis, Rectus Abdominis and Vastus Lateralis, while the most commonly used FC flaps were Anterolateral Thigh, Radial Forearm and Lateral Arm. We observed statistically significant differences ( $p < 0.05$ ) in terms of donor site morbidity and total flap loss in favor of FC free flaps. Moreover, the majority of authors affirmed to prefer FC flaps because of greater aesthetic satisfaction and reduction of postoperative infection.

**Conclusions:**

Both M and FC free flaps are safe and effective options for lower limb reconstruction following trauma, infection or tumor resection although FC flaps tend to provide stronger benefits in terms of donor site morbidity, flap survival and aesthetic satisfaction. Further research should include larger randomized studies to confirm these data.

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**Abstract No.: 295**

**Category: Microsurgery**

**Time: 4**

**CR: Yes**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Successful traumatic limb reconstruction with Three Free Flaps Connected in Series to a Single Recipient Artery and Vein

**Introduction:**

Occasionally, large wounds of the lower extremity require multiple free flaps to achieve coverage. For reasons of wound geometry, recipient vessel location, or recipient vessel depletion utilization of a single recipient vessel site may be preferable. It is unknown how many free flaps can be chained together based on a single recipient vessel. Herein we report a case of three free flaps connected in series.

**Case Report:**

An otherwise healthy woman developed a limb-threatening circumferential wound of the leg resulting from chronic subcutaneous IV drug injection. To cover the wound, three flaps were connected in series to the anterior tibial vessels. A latissimus myocutaneous flap was first anastomosed to the anterior tibial vessels, with an end-to-end arterial anastomosis and a single venous anastomosis. The serratus branch was used as a flow through vessel to connect an ALT flap. The distal portion of the ALT flap pedicle was then used as a flow through for a second ALT flap. The second ALT flap was inset wrapped around the leg, with the venous drainage oriented against gravity.

All three flaps survived completely and provided coverage of the critical defects, with the only inflow and outflow being via the anterior tibial artery and a single anterior tibial vein. The venous drainage of the third flap proceeded successfully against gravity.

**Conclusions:**

A single recipient artery and vein appear to be sufficient to support three free flaps connected in series, even when venous drainage is oriented against gravity. To our knowledge, this is the first report of such technique.

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# SESSION 8

# PELVIC, PERINEAL & GENDER



**Abstract No.:** 270

**Category:** Clinical PRS General

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Autologous Fat Grafting in the conservative treatment of Pediatric Anorectal Malformations (ARM)

**Introduction:**

Pediatric fecal incontinence, typical of anorectal malformation (ARM), is a multifactorial problem leading to marked relationship disorders, especially in scholar age. The daily management of this condition greatly affects patients' social acceptance, as well as parents' social life and familiar aspects.

We present our experience with the UltraSound (US)-assisted anal-lipofilling to treat mild ARM in pediatric patients and the impact on the quality of life (QoL) of the entire family.

**Materials and Methods:**

We enrolled pediatric patients affected by ARM, referred to our center between 2018 and 2021, and selected as mild status according to Krickenbeck's scale scores (KSs).

All the enrolled patients underwent morphological and functional evaluation (trans-anal US-3D 2052 transducer and manometry) and clinical evaluation (KSs).

To evaluate the impact of the disorder on the family and social life, a QoL's questionnaire (3 items) was used.

**Results:**

From 2018, we performed fifteen anal-lipofilling procedures in eight male patients (mean age 10.7 years). No major post-operative complications were reported. Seven children had a stable improvement in bowel function with Krickenbeck's scale scores going from soiling grade III pre-treatment in 100% of children to grade I post-treatment in 75% of them.

An average of 18% increase in thickness (from 1,2mm to 1,42mm) and a pressure rise average of the basal tone from 21mmHg to 31,5mmHg of the sfincterial apparatus were shown at US during 6 months follow-up. The QoL of the entire family, evaluated with a QoL's questionnaire, improved after the surgical treatment of the children, reporting a variable percentage according to family lifestyle, depression, embarrassment and altered self-perception felt by parents.

**Conclusions:**

Autologous fat transplantation is a safe and effective procedure to reduce organic fecal incontinence, becoming a new treatment option for the fecal incontinence due to ARM, with benefits for the children and their families.

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**Abstract No.:** 106

**Category:** Clinical PRS General

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Intraoperative Radiotherapy Associated to Abdominoperineal Amputation and Immediate Reconstruction With Flaps: Retrospective evaluation in 98 patients

**Introduction:**

Abdominoperineal amputation is the treatment of choice for large pelvic tumors. Surgery can be associated with intraoperative electron radiotherapy (IOERT) to optimize local control of the disease. Wide defects need to be reconstructed immediately and large flaps shall be essential to avoid pelvic complications. There is scarcity of publications evaluating outcomes of reconstructive procedures associated with IOERT.

**Materials and Methods:**

A retrospective study in 98 patients between 2005 and 2020 was performed. Fifty-nine patients received IOERT (group I [G1]) and 39 did not (GII). We examined demographic characteristics, tumor pathology, type of resection, volume of surgical specimen, timing of surgery, IOERT doses, postoperative stay, and complications. We used for reconstruction rectus abdominis, gluteal, omental, gracilis, SGAP flap, and free flaps.

**Results:**

Colonic adenocarcinoma, genital squamous cell carcinoma and chordoma were the most frequent tumors. Mean IOERT dose was 1250+/-45 cGy; 71 % of patients had previous surgeries and 82.2 % had previous local radiotherapy. Rectus abdominis (63.5% of cases), gluteal, omental and gracilis, SGAP, Singapur flap and free flaps were used for reconstruction.

Mean operating time was 10.35+/-3.05 versus 6.40+/-3.26 hours (G1 vs G2); hospital stay was 37 (21.2-3.0) versus 26.0 (12.0-60.0) days and volume of surgical specimen was 480.5 mL versus 400 mL in G1 and GII, respectively. There were significant positive correlations between operating time ( $p<0.05$ ), hospital stay ( $p<0.01$ ) and volume of surgical specimen ( $p<0.05$ ).

Main complications were exudative wounds and wound dehiscence (40% vs 39%) at the reconstructed area. Intrapelvic seroma was reported in G1 and GII (27% vs 26%) respectively. In G1 there were complications at the donor zone in 13% of cases vs 16% in GII. Complications were similar to previous studies with or without radiotherapy.

**Conclusions:**

Under a reconstructive approach, IOERT did not harm flap survival nor increased pelvic complications when compared with similar cases without IOERT.

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**Abstract No.: 76**

**Category: Microsurgery**

**Time: 4**

**CR: Yes**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Free Fillet Lower Leg Flap for Reconstructiton after Hemipelvectomy with using of Pelvis Fenestration - Case report

**Introduction:**

An extensive tumor resection is essential in the therapy of malignant osteosarcoma of the limb. Extensive proximal femoral osteosarcoma sometimes requires hemipelvectomy with lower limb amputation. Traditional methods of covering the resoultng defect with a local flap often leads to wound dehiscence, partial necrosis and prolonged healing.

**Case Report:**

A 34-year-old woman with advanced stage osteosarcoma of the right femur extending to the right hemipelvis was treated with hemipelvectomy followed by reconstruction of the defect using a free fillet lower leg flap. The flap was harvested from the amputated limb on a popliteal pedicle. The operation lasted for 6 hours and 30 minutes. The hemipelvectomy and the fillet flap harvesting was performed simultaneously. The flap contained the distal part of the fibula, which was then used to replace the missing pubic part of the pelvis. The fibula was wedged between the iliac part of the pelvis and the symphysis. Chosen approach led to the situation, where the popliteal vessels of the flap were located on the opposite side of the pelvis than the recipient external iliac vessels. This situation was solved by creating a 3x3 cm fenestration in the fossa iliaca, through which the popliteal artery and vein were passed and an anastomosis was performed without tension. The flap was completely perfused and without any additional problems. The operation and postoperative course were without complications and the patient was discharged on tenth postoperative day.

**Conclusions:**

A free Fillet lower leg flap is a suitable and versatile method for reconstruction of large defect after hemipelvectomy and lead to improvement and shortening of postoperative healing. The flap rotated by 180 degrees allows better use of the fibula for reconstruction of the pelvis. The vascular pedicle can be inserted into the pelvis through the bone window and we can create a vascular anastomosis without any compromises.

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**Abstract No.: 69**

**Category:** Clinical PRS General

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Outcomes of clitoral reconstructive surgery after Female Genital Mutilation/Cutting (FGM/C): 10 years' experience in the Netherlands.

**Introduction:**

As a result of the empowerment of migrated women from Africa and the Middle East, the awareness and demand for clitoral reconstructive surgery after Female Genital Mutilation/Cutting (FGM/C) is increasing. We present our ten years of experience and the outcomes of this surgery in 45 cases.

**Materials and Methods:**

From January 2010 until January 2021, 72 women presented with FGM/C. All underwent well-specified patient selection before operation. Clitoroplasty, according to the Foldès technique, was performed after counseling. These patients were followed up for 13 months. A questionnaire was used for outcome evaluation of the surgery.

**Results:** 19 out of 72 women (26%) were not suited for clitoral reconstructive surgery because they had comorbidities that had to be dealt with first ( $n = 5$ ) or had unrealistic expectations about the outcome of surgery ( $n = 12$ ) or only wanted information about the procedure ( $n = 2$ ). One woman chose to have only her Bartholin cyst treated after preoperative consultation. One referral was a secondary case. Up to January 2021, 45 patients have been operated on, and six patients are on the waiting list. Primary clitoroplasty was performed on the remaining 45 women.

**Results:**

Postoperatively, we observed four minor postoperative complications. 35 of these 45 women were fully satisfied with the surgery and had better self-esteem after surgery (76%). Four women were disappointed with the esthetic outcome but still were satisfied to have undergone surgery. The six remaining women were lost for follow-up.

**Conclusions:**

: Clitoral reconstructive surgery after well-specified preoperative patient selection leads to a high patient satisfaction with minor surgical complications. This minor surgery in case of wish for reconstruction can be acknowledged after careful counseling.

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**Abstract No.:** 139

**Category:** Clinical PRS General

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Access to Comprehensive Care for Female Genital Mutilation Including Reconstructive Surgery in Western Europe and the United States

**Introduction:**

Female genital mutilation/cutting (FGM/C) is the intentional alteration, removal, or injury of female genitalia for non-medical reasons. FGM/C affects nearly 200 million women worldwide, many of whom live in developed countries. Genital reconstructive procedures have promising functional and patient-reported outcomes, but it is unclear how many victims have access to appropriate surgical and associated psychosocial care. The purpose of this study was to determine how many victims of FGM/C have access to comprehensive care, including reconstructive surgery, in Western Europe and the United States (U.S.).

**Materials and Methods:**

FGM/C care centers were identified using End FGM European Network. Access to comprehensive care (surgical, psychological, sexological, gynecologic) and access to publicly insured FGM/C care within the country (Western Europe) or the region (U.S.) was documented. Population data were extracted from End FGM European Network, World Bank for Europe, U.S. Centers for Disease Control and Prevention, and U.S. Census Bureau. Western European countries included Belgium, Cyprus, Finland, France, Germany, Greece, Ireland, Italy, Portugal, Spain, Sweden, Switzerland, Netherlands, and United Kingdom. The U.S. was divided into five regions: Northeast, Southeast, Midwest, Southwest, and West.

**Results:**

Approximately 1.3 million women in Western Europe and the U.S. are affected by FGM/C. Reconstructive surgery in these areas is offered by plastic surgeons (36.8%), gynecologists (57.9%), and urologists (5.3%). 32% (n=411,624) of women do not have access to reconstructive surgical care (Western Europe: 30.8%, U.S.: 33.8%). 57.7% (n=742,784) of affected women do not have access to comprehensive care (Western Europe: 42.8%, U.S.: 80.3%). 69.4% (n=892,621) do not have access to publicly insured care (Western Europe: 49.1%, U.S.: 100%).

**Conclusions:**

Female genital mutilation/cutting affects millions of females in the developed world. One-in-three of these women do not have access to reconstructive surgical options. Most affected women cannot obtain publicly insured comprehensive care. Plastic surgeons should consider incorporating this vital service into their armamentarium.

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**Abstract No.:** 111

**Category:** Clinical PRS General

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Improved Surgical Outcome with Double Incision and Free Nipple Graft in Gender Confirmation Mastectomy

**Introduction:**

Mastectomy and chest-wall contouring is the most common gender confirmation surgery. With increasing prevalence of transgender individuals, there is a demand for better surgical outcomes and aesthetic results. Our aim was to evaluate surgical techniques used and assess modifications in gender confirmation mastectomies at Karolinska University hospital in Stockholm, Sweden.

**Materials and Methods:**

A retrospective cohort study was performed on 464 patients undergoing gender confirmation mastectomies in our department between 2009 and 2018. Patient demographics, psychiatric comorbidity, surgical method, and outcome were analyzed. Follow-up was at least one year.

**Results:**

The most frequently used surgical technique for gender confirmation mastectomies was double incision with free nipple graft (243 patients, 52.4%), followed by periareolar incision (113 patients, 24.4%) and semicircular incision (67 patients, 14.4%). The double incision technique and periareolar technique were associated with 18.9% and 28.3% complications, 3.3% and 12.4% acute reoperations, 28.4% and 65.5% secondary revisions, respectively. The double incision technique increased from being used in 17.8% of all mastectomies during 2009-2013 to 62.9% during 2014-2018, while periareolar incision decreased from 43.0% to 18.5%.

**Conclusions:**

The current study describes a successful transition of surgical technique from periareolar incision to double incision with free nipple graft in gender confirmation mastectomy, leading to significant improvements in the overall outcome with fewer complications, less acute reoperations and less secondary corrections. Hence, we consider the double incision with free nipple graft technique to be the favored technique in the vast majority of cases in female-to-male chest wall contouring.

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**Abstract No.: 70**

**Category:** Clinical PRS General

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Vagino-clitoro-labioplasty for trans women: surgical technique and results of first series of 108 patients

**Introduction:**

Since 2011, a total of 108 Vagino-clitoro-labioplasty (VCL) for trans women with gender dysphoria have been performed at our unit. The number of procedures per year has increased up to 19 in 2019.

**Materials and Methods:**

Our technique for VCL consists in a one-stage surgery; it incorporates refinements by the UK, Belgian and Thai schools, and it presents novelty in the decisional approach to the cavity dissection.

Pre-operatively, a prostate MRI is performed.

Key-points of the technique are: blunt or sharp methods for creation of the vaginal cavity (depending upon the contingent surgical anatomy); resection of corpus spongiosum; urethra spatulation and neurovascular gland flap for clitoris and labia minora reconstruction; mini-scrotal-flap for the creation of the inferior fourchette; construction of labia majora from scrotal and inguinal tissues. Patients records have been analysed retrospectively. 87 patients have been followed up for longer than 1 year.

**Results:**

Average surgical time was just below 3 hours. Nine cases underwent a zero-depth VCL.

10 % of the patients required transfusion post-operatively. Two patients presented with recto-vaginal fistula after surgery. Intra-operatively, a rectal damage was never detected. Other reported complications were minor (grade 1-2 as according to the Clavien Dindo classification) and consisted in: persistent granulation tissue (30,7%), excessive labia majora (24,7%), and wound dehiscence (23,7%, which always healed by secondary intention, and without any cosmetic sequelae). No patient reported urethra fistula.

35,7 % of the patients required some form of revision surgery; apart for those two patients presenting recto-vaginal fistula, revisions for all other patients mostly consisted in minor adjustments, as reduction of labia majora, episiotomy, and meatoplasty.

Most of the patients were (very) satisfied of the final result achieved.

**Conclusions:**

Research of high level is required, mostly to correlate the surgical outcomes to patients' quality of life.

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**Abstract No.:** 116

**Category:** Clinical PRS General

**Time:** 4

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Quality of chest wall masculinization in transgender men - a retrospective study

### **Introduction:**

In transgender men, the most common gender affirming surgery is chest wall masculinization. This study aims to review the quality of chest wall masculinization in single institute and elucidate factors impacting complication rates and corrective surgery.

### **Materials and Methods:**

The data comprised all patients receiving chest wall masculinization in Helsinki University Hospital between 2005-2018. Data regarding sociodemographic features, surgical technique and outcomes were collected from patient records.

### **Results:**

The mean age of the 220 patients was 25.6 years and mean follow-up time 20 months. Number of patients increased over time. Peri-areolar incision was used on 53.7% while 46.3% had a subpectoral incision. Out of the subpectoral group 39.8% had a free nipple-areola (NA) graft. Patients with free NA graft had higher risk of NA necrosis, 16.7% compared to 3.6%. Surgically managed complications occurred in 15.4% with 9.1% having major and 6.7% having minor complications. Wound healing issues managed with conservative treatment occurred in 43.8%. Patients obtaining complications were older ( $p<0.01$ ) and had larger resections ( $p<0.05$ ). Corrective surgery was performed on 58.3% with most common cause being excess tissue and NA corrections. Patients receiving corrective surgery were older ( $p<0.05$ ), had shorter hormonal therapy ( $p<0.05$ ) and were more often using psychiatric medication ( $p<0.05$ ). When comparing patients operated at three different time periods, smoking ( $p<0.05$ ), corrective surgery ( $p<0.05$ ) and proportion proceeding to genital surgery ( $p<0.01$ ) decreased over time. Simultaneously, length of preoperative hormonal therapy increased ( $p<0.01$ ).

### **Conclusions:**

In this study, major complication rate was similar to previous studies. The surprisingly high rate of corrective surgery could be explained with our longer follow-up time since need for corrective surgery might emerge years from surgery. Interestingly, proportion of patients proceeding to genital surgery significantly decreased in time. The patients undergoing chest wall masculinization should be informed regarding high risk of wound healing issues and need for corrective surgery.

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**Abstract No.: 173**

**Category: Aesthetics**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** FACIAL FEMINIZATION SURGERY IN TRANSGENDER PATIENTS MtF

**Introduction:**

Facial feminization surgery has become an integral part of the transition process of Gender Dysphoria's patients and it is considered as "a necessary surgery" by the "WPATH Standards of Care 8th version".

The main purpose of this surgery, is to modify and attenuate masculine features, in order to obtain a more feminine and harmonious appearance.

**Materials and Methods:**

Between September 2017 to date, 10 facial feminization procedures were performed on transwomen at the Dept. of Plastic Surgery of the University of Palermo. All patients had previously underwent sex reassignment surgery.

Preoperative facial CT with 3D reconstruction were performed (to plane the operations identifying the masculine anatomic findings) and Body Uneasiness Test was administered (in order to assess the body image).

The mean age of the patients was 34 yo (range 25-45 years). The mean postoperative follow-up was 15.6 months (range 4-30 months).

The operations were carried out using bone and soft tissue remodeling techniques of the face and neck, individually or mixed.

**Results:**

Rhinoplasty, correction of the frontal bossing, remodeling of the orbital contour and lipofilling were the most common procedures, and were performed at the same surgical time in 8 out of 10 patients.

No complications occurred and no secondary revisions were performed in all patients. Furthermore, an improvement of body image was highlighted.

**Conclusions:**

Careful preoperative planning is essential to identify and correct male facial features.

In this case series patients satisfaction with outcomes was high, and no patient required secondary corrections.

The feminization procedures can satisfactorily modify male anatomical features of the face, making patients more feminine.

A more feminine face allowed these people to feel more comfortable in society, family and work place, considerably improving their quality life and their body image.

The ideal timing for SBB is still being discussed, as there are currently no international guidelines.

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# SESSION 9

# AESTHETIC PLASTIC SURGERY



**Abstract No.: 144**

**Category: Aesthetics**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Visualising the individual arterial anatomy of the face through augmented reality - a useful and accurate tool during dermal filler injections.

**Introduction:**

The human anatomy is extremely variable and so is the arterial anatomy of the face. Despite numerous cadaver dissections and anatomical descriptions, the exact location of the superficial arteries of the face remains very unpredictable. The ignorance of the unique and individual arterial anatomy of the face is a determining factor in the pathophysiology of intravascular filler injections. This dreadful complication may lead to skin necrosis and even blindness, two of the most feared risk factors when treating patients with dermal fillers.

**Materials and Methods:**

A practical and reproducible workflow was developed during which a magnetic resonance angiography (MRA) of the face (without contrast agent) was used to map all the superficial arteries of the face (facial, inferior labial, superior labial, angular, lateral nasal, dorsal nasal, supratrochlear, supraorbital and superficial temporal arteries). The images were further processed into an augmented reality (AR) image that was visualised on the patient's face using a specifically designed smartphone application. The accuracy of the AR-image and positioning of each individual artery was analysed using duplex ultrasound.

**Results:**

A total of 216 facial arteries were visualised in 20 patients using the MRA-sequence. Of all the arteries, the superficial temporal (100%), supratrochlear (92.5%), facial (75%) and angular (82.5%) arteries were visualised the most. The inferior labial (17.5%), dorsal nasal (22.5%) and supraorbital (42.5%) arteries were the most difficult to visualise through MRA. The average deviation between the artery visible on the AR-image and located through ultrasound was 0.30mm ( $SD = +/- 0.66mm$ ). There were no complications with regards to the MRA-imaging.

**Conclusions:**

The combination of a risk-free MRA to map the individual arteries of the face and the processing into an AR-image that can be visualised on a smartphone may be a useful and accurate tool during dermal filler injections to potentially minimize the risk of intravascular filler injections.

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**Abstract No.:** 214

**Category:** Aesthetics

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Blepharoplasty: Patient and surgeon perception of complications after minor elective procedure - the Clavien-Dindo Classification (CDC) revisited

**Introduction:**

Blepharoplasty surgery lacks accurate numbers of standardized complication rates and classifications for reproducible comparison. This study aims to validate the applicability of the Clavien-Dindo-Classification (CDC) on one of the safest generally elective minor procedures and to evaluate the patients' and surgeons' perception of complications.

**Materials and Methods:**

Patients (N=344) who received a bilateral upper lid blepharoplasty under local anesthesia were retrospectively evaluated and interviewed. The CDC, a 5-step grading system, was used to categorize postoperative complications, which is currently used to classify major, invasive surgeries. A follow-up survey based on data retrieved from a patient-reported outcome measure (PROM), as well as surgeons and patients perceptions were evaluated.

**Results:**

Based on the CDC, we observed one patient (0.3%) with a revision under general anesthesia (CDC IIIb), 18 cases (5.2%) were re-operated under local anesthesia (CDC IIIa), 23 patients (6.7%) required pharmacological intervention (CDC II), and 159 patients (46.2%) had a deviation from the normal postoperative course without further pharmacological or surgical intervention (CDC I). All complications were observed in the first follow-up on day seven. 94% of patients were very pleased with the postoperative result regardless of the experience of any of the CDC classified complications. 49.1% of patients and surgeons were both satisfied even though a complication was registered.

**Conclusions:**

We demonstrated the applicability of the CDC in this quick, secure aesthetic procedure, which was not proven before for minor procedures. No grade IV and V complications were found, with a low number of revision surgeries. Surprisingly, grade I complications did occur frequently, despite patients' and surgeons' perceptions. Here, just conservative support was needed. Institutional data utilizing the CDC can provide objective comparisons of postoperative complications, and improve the Informed Consent prior to surgery. Furthermore, the CDC can reduce costs from legal litigation, and answer the requests from insurance through its objective review.

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**Abstract No.: 22**

**Category: Aesthetics**

**Time: 4**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Management of the Supratip in Rhinoplasty: The External Supratip Suture

**Introduction:**

Supratip deformity, also known as the pollybeak deformity, accounts for one of the most common iatrogenic deformities requiring revision surgery in rhinoplasty. We aimed to present an effective technique to prevent supratip deformity and increase the tip definition especially in patients with thick skin.

**Materials and Methods:**

A total of eighty-three patients were included in the study. In control group, thirty-three consecutive patients with thick skin underwent structured primary rhinoplasty without any additional maneuvers. In study group, thirty-one consecutive patients with thick skin underwent the same operation with an additional “External supratip suture (ESS)”. Following completion of the surgery, if any skin resistance to adaptation to the underlying structures in the supratip region was felt by palpation, we used an ESS to close the dead space in the supratip region and form a barrier against postoperative swelling which might end up as fibrosis causing unwanted convexity. Nineteen patients with moderate skin were also operated using the ESS to accentuate the supratip break and control the soft tissue response. Patients' supratip regions were analyzed with reference to a tangent line from the tip defining point to the nasion. An independent blinded plastic surgeon rated the supratip aesthetics on a 5-point scale.

**Results:**

Average follow-up was 12 months. The ESS maneuver had better results in the supratip region according to the two parameters which were statistically significant ( $p<0.05$ ). No ischemic complications were observed.

**Conclusions:**

This simple and reliable external approach is a powerful maneuver which can be an effective technique not only in patients with thick skin, but also in moderate skin patients who requires better supratip definition. It enables surgeon to reduce the nasal volume efficiently in patients with noncompliant skin by controlling skin redraping by adhering to Auersvald's hemostatic net principles. We believe that this approach will find a place in the armamentarium of rhinosurgeons.

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**Abstract No.:** 112

**Category:** Aesthetics

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Volumetric Analysis and Quality of Life Outcomes Three Months After Hyaluronic Acid Injectable Facial Filler

**Introduction:**

Over 2.6 million minimally-invasive procedures for hyaluronic acid (HA) soft tissue filler were performed nationwide in 2020. Despite their widespread use, there is a lack of literature on long term volumetric analysis or patient reported outcomes (PROs) as it relates to hyaluronic acid facial fillers in women. This prospective study aims to quantify PROs and volumetric changes up to 3 months after treatment with HA fillers.

**Materials and Methods:**

Women aged 40-65 were consented. Subjects were injected in the nasolabial folds, marionette lines, malars, and/or cutaneous vermillion border in a standardized fashion using Restylane® dermal fillers. Subjects completed 12 independent domains of the FACE-QTM questionnaire and were photographed pre-injection, post-intervention, 2 weeks, 4 weeks, and 12 weeks post-injection using 3D Vectra® M3 Imaging Software. 3D images were layered and calibrated for volumetric analysis.

**Results:**

Sixty-nine women received intervention. On 3D analysis, medians of 71.3% and 69.1% of injected volume were maintained in the lower- and mid-faces at 12 weeks, respectively. Improvements in PROs were seen from baseline to 3-months in appraisal of facial appearance, lips, cheekbones, cheeks, lower face/jawline, psychological function, social function, and psychosocial distress (all  $p<0.05$ ), but not with evaluation of aging, nasolabial folds, and marionette lines. Volumetric augmentation in the lower face was correlated with improvements in judgement of aging, psychological function, social function, and satisfaction with outcome; increased total volume correlated to both psychological function and satisfaction with outcome (all  $p<0.05$ ).

**Conclusions:**

Adequate volume is maintained 3 months after HA facial fillers. Further, facial fillers indeed improve patient reported outcomes in multiple facial domains at 3 months following injection, and volumetric augmentation is correlated to improvements in specific PRO domains. Clinicians should consider long term patient goals when advising patients on HA facial fillers. Additional studies using longer terms and fillers of different rheological characteristics is needed.

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**Abstract No.: 125**

**Category: Aesthetics**

**Time: 4**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Facial Fat Grafting (FFG): is it a safe procedure? A critical review of different complications of facial lipofilling.

**Introduction:**

Autologous fat is ideal soft tissue filler. It is easily accessible, biocompatible, cheap, and it provides both volume augmentation and skin quality improvement. Every year more than half a million facial fat grafting procedures are performed worldwide and the trend is rapidly increasing. Overall general complication of facial fat grafting is assumed to be around 2%, with no reports expressing clear quantitative data.

**Materials and Methods:**

Until July 2021, a systematic search of the literature was performed interrogating PubMed search engines. The following algorithm was used for the research: (fat graft OR lipofilling) AND face AND complications. Exclusion criteria applied hierarchically were: review articles, not reporting recipient site complications; not in English, paediatric population. Pertinent full-text articles were retrieved and analysed, and data were extracted on the database.

**Results:**

462 papers were identified by PubMed search. 359 were excluded after criteria application. Average complication rate ranged from 1,5% to 81,4%. A total of 298 adverse events were identified: 40 (13,4%) intravascular injections, 13 (4,3%) asymmetry, 57 (19,1%) irregularities, 22 (7,4%) graft hypertrophy, 21 (7%) fat necrosis, 73 (24,5%) prolonged oedema, 1 (0,3%) infection, 6 (2%) prolonged erythema, 15 (5%) telangiectasia and 50 (16,8%) cases of acne activation.

**Conclusions:**

FFG related side effects could be resumed in three categories: severe, moderate and minor. Severe (13,4%) side effects-like intravascular injection or migration-require neurological or neurosurgical management and often lead to permanent disability or death. Moderate (38,3%) side effects like fat hypertrophy, necrosis, cyst formation, irregularities and asymmetries require a retouch operation. Minor (48,3%) side effects like prolonged oedema or erythema requires no surgical management. Real complication rate of facial fat grafting is still unknown because of lack of reporting and absence of consensus on side effect definition and identification. More RCTs are necessary to further determine the real complication rate of this procedure.

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Pietro di Summa

**Abstract No.:** 38

**Category:** Aesthetics

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** The implant related mortality risk and the rationale for prophylactic explantation of patients at high risk of BIA-ALCL

**Introduction:**

Prophylactic explantation of patients at high risk has not been yet indicated because of the low incidence of BIA-ALCL, the unproved efficacy and surgical related risk. BIA-ALCL risk (1:335-1:3,345) proved 3,000-300 times higher than the expected by Carcinogenic risk analysis (9:1,000,000) in patients with two textured/PU Silimed implants, and a presumed total max exposure of 3,026 Man Made Mineral Fiber (ICEAG 2016). Efficacy remains difficult to be calculate without proper trial, while Implant Related Mortality (IRM) can be.

**Materials and Methods:**

Mean age for 1st implant positioning (A1P), Implant Life Span (ILS) and Woman Life Expectancy (WLE) were obtained from literature. Implant Mortality Risk (IMR) was calculated as the intrahospital mortality after implantation, explantation or exchange, and investigated on 99,694 patients, matching three National Italian database (2012-2019).

**Results:**

Mean A1P in breast augmentation is 34yy, but not known in reconstruction. As the mean age for breast cancer is 62yy, with an augmentation/reconstruction ratio of 4:1, mean A1P regardless of indication can be presumed as  $34 \times 0.75 + 62 \times 0.25 = 41$ yy. With a mean ILS of 9yy, and WLE 85yy, a woman on average will replace her implants 4 times; IMR risk was 0:99.964.

**Conclusions:**

Given the high Rupture (24-39%), Replantation (14% at 3yy, 49% at 10yy), and Reoperation (12%-71.5% at 10yy) rates, and a neglectable IMR of 0:99.964 vs a relevant BIA-ALCL mortality risk of 1:33,4, it should be possibly taken in consideration to explant patients at high risk to prevent BIA-ALCL since recall demonstrated not creating an additional burden on health care system in USA.

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**Abstract No.: 296**

**Category:** Clinical PRS General

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Breast Augmentation by Water-Jet Assisted Autologous Fat Grafting plus implant: A Report of (130) Operations

**Introduction:**

The BEAULI method is ready for extraction and processing of massive fat quantities. The aim of this work is to describe the surgical technique correctly and to give an overview of the hybrid mammoplasty based on surgical practice. Moreover, we isolated the stromal vascular fraction (SVF), mechanically processed and observe their biological characteristics.

**Materials and Methods:**

The author performed 130 hybrid mammoplasty both for aesthetic breast augmentation and breast reconstruction after carcinoma exeresis, on 80 women between 2014 to 2020. Patients desiring reasonable volume increase, filled and firmer breasts, as well as a correction of the silhouette. The fat was extracted by means of water-jet assisted liposuction (Body-jet, Human Med) technology, and the fat cells were consequently separated with the Lipocollector ® (Human Med).

**Results:**

This fat product contained hASCs expressed CD29, CD44, CD49d, CD73, CD90, and CD105, and molecular analysis also showed significant hASC uniformity within the cells of the stromal vascular tissue. Moreover, the fat product produced a higher quantity of hASCs similar to hMSCs. The “in vivo” results were assessed by photo evaluation, capsular contractures and were based on the responses on a questionnaire. Assessment of patient-rated satisfaction on a 5-point Likert scale found that 80% of patients were satisfied (54.5%) or very satisfied (25.5%) with their outcomes.

**Conclusions:**

This study shows that the hybrid mammoplasty by water-jet assisted liposuction in combination with implant achieves an harmoniously appearing breast volume enlargement as well as contour improvement.

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**Abstract No.: 115**

**Category: Aesthetics**

**Time: 4**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Characterizing morbidity and mortality after aesthetic abdominal surgery: a US nationwide analysis

**Introduction:**

Abdominoplasty is among the most common aesthetic surgeries performed in the US and is increasing in popularity each year. The procedure, however, remains associated with a relatively high complication rate. As aesthetic abdominal surgery is not always performed by board-certified plastic surgeons in the US, we sought to quantify and describe all major complications after abdominoplasty by any surgeon.

**Materials and Methods:**

All adult patients undergoing cosmetic abdominoplasty or panniculectomy were identified using CPT codes from available State Ambulatory Surgery Databases from 4 states (Florida ['07-'17], New York ['08-'16], Maryland ['14-'16], Wisconsin ['14-'16]). The primary outcome was death or need for unplanned medical care within 90 days after surgery. Categorical variables were compared using chi-squared analyses.

**Results:**

18,759 patients met inclusion criteria. The average patient was 44 years old (IQR 36-53), female (93.85%), and White (53.73%). 17.9% of patients (n=3,357) required unplanned medical care within 90 days after abdominoplasty. The total cost of this care was approximately \$45,226,675 USD. Black and Hispanic patients were significantly more likely to suffer a morbidity as compared to White patients ( $p<0.001$ ). 0.03% of patients (n=6) died in the peri-operative period, an average of 17.1 days after abdominoplasty. The most common causes of death included pulmonary embolism, sepsis, and prescription drug poisoning.

**Conclusions:**

Nearly 1 in 5 patients will require unplanned medical care within 90 days after abdominoplasty. Black and Hispanic patients appear to suffer a disproportionately higher burden of these complications on a nationwide level as compared to White patients. Nearly 1 in 3000 patients will die within 90 days of abdominoplasty, on average 17.1 days after the index operation.

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**Abstract No.: 168**

**Category: Aesthetics**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Combined Refining of Abdominal Laxity and Breast Deformity Through Reverse Abdominoplasty

**Introduction:**

A surgical technique combining abdomen rejuvenation and autologous breast augmentation/mastopexy is described. Surgical plan is supported by a detailed anatomical study of the supra-umbilical abdominal wall showing flaps that can be transposed sub-glandularly, creating autologous tissue breast augmentation, and allowing an aesthetic improvement of the abdomen through reverse abdominoplasty.

**Materials and Methods:**

Retrospective study was conducted on 18 patients underwent augmentation mammoplasty/mastopexy by reverse abdominoplasty between 2012 and 2018. Patients were asked to fill out the BODY-Q, a patient reported outcomes instrument designed specifically to measure quality of life after body contouring surgery.

**Results:**

Only minor complications occurred, mainly related to scar quality and position, and were easily corrected. Significant improvements were reported at the follow-up concerning physical, functional, and psychosocial dimensions of health-related quality of life.

**Conclusions:**

The combined refining of upper abdominal laxity and breast deformity with reverse abdominoplasty can successfully allow two aesthetic problems simultaneously in selected patients, providing stable autologous tissue, that can obviate the use of prosthetic implants in the breast, and rejuvenating the abdomen. This technique is indicated for patients with a skin laxity predominantly in the upper abdomen. Previous inframammary scars and breasts with wide bases favor the indication of this technique as they tend to better hide the scar. The technique is only contraindicated in patients with a previous history of keloid

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**Abstract No.:** 278

**Category:** Aesthetics

**Time:** 8

**CR:** No

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Performing monsplasty in aesthetic and reconstructive surgery - Don't neglect it... perfect it !

**Introduction:**

Addressing the mons pubis ptosis is often a necessity in bodycontouring surgery, but remains a neglected procedure. Our prospective study describes a reproducible surgical technique to improve the aesthetics of the mons pubis and analyses the postoperative functional and aesthetic outcomes.

**Materials and Methods:**

Patients with at least grade 2 mons pubis ptosis (according to the El Khatib Classification) who underwent either an aesthetic abdominoplasty or DIEAP flap breast reconstruction were included in the study and followed for three months postoperatively. Pre- versus post-operative analysis included body image, psychological function, sexual function, urinary function and improvement of hygiene. Additionally, post-operative complications and scar evolution were analysed.

**Results:**

Between September 2020 and September 2021, a total of 20 patients were included. They reported a significant improvement in body image ( $p=0.006$ ), satisfaction with the abdomen (0.033), and sexual functioning (0.049). Regarding functional outcome, we noticed an improved hygiene of the pubic area in 21%, an improved sex life in 41%, improved genital sensitivity in 21%, and a better urinary continence in 7%. The patient satisfaction was very high with 83% of the patients reporting to repeat the procedure and 86% would recommend it to a friend. There were no major complications.

**Conclusions:**

The monsplasty is a fairly simple and fast procedure that can truly bring an added value to the patient's post-operative satisfaction and functional outcome. It can be incorporated in both aesthetic and reconstructive procedures and should be a standard addition to the operation in case of mons ptosis grade 2 or higher.

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**Abstract No.: 166**

**Category: Aesthetics**

**Time: 8**

**CR: No**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Incisional Negative Pressure Wound Therapy (piNPWT) to Reduce Local Complications of Post-Bariatric Brachioplasty

**Introduction:**

Portable incisional negative pressure wound therapy (piNPWT) is a medical device used to improve wounds healing and reduce post-operative complications, which have been shown promising results in post-bariatric population. We evaluated the role of piNPWT in optimizing wound healing and controlling post-operative complications after a post-bariatric brachioplasty.

**Materials and Methods:**

26 post-bariatric female patients who underwent a brachioplasty followed by either a piNPWT (14 cases) or a standard wound treatment (12 controls) were analyzed. The number of post-operative dressing changes, the rate of local post-operative complications (re-operation, hematoma and serosa development, dehiscence and necrosis), the time to dry as well as the scar quality and hospitalization length were evaluated.

**Results:**

None of the patients prematurely stopped treatment with piNPWT due to intolerance. The piNPWT patient group showed a significant lower healing time as well as a significant reduction of the number of post-operative dressing changes and hospital stay. Despite the scarring process was excellent from the functional point of view in the long term, we noticed a higher rate of hyperchromic scarring at 90 days after surgery.

**Conclusions:**

The piNPWT is a cost-effective and user-friendly medical tool that increase and promote wound healing. We suggest the use of this device in post-bariatric patients who undergo a brachioplasty, especially if there is the need to minimize the number of post-operative dressing changes. This device open innovative field of investigation in the treatment of wound and prevention of unfavourable scarring.

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**Abstract No.: 275**

**Category: Aesthetics**

**Time: 4**

**CR: Yes**

**Event :** 32nd Annual EURAPS Meeting, NAPLES, Italy, 26-28 May 2022

**Title :** Long-term complications after aesthetic procedures and vaccination: anecdote or reality? A case report

**Introduction:**

Vaccinations seem to be capable of leading to delayed-onset complications such as inflammatory reaction distant from the injection site. The exact underlying mechanisms responsible for eliciting such complications remain unknown. We describe an event occurred after lower lid blepharoplasty that could be related to SARS-CoV-2 vaccine.

**Case Report:**

A 63 years old man with no medical history performed a transcutaneous lower lid blepharoplasty in February 2021. The postoperative course was uneventful.

On June 22, the patient got the second dose of SARS-CoV-2 Pfizer mRNA Vaccination. No change in life-style, health or therapy have been reported following the surgical procedure and the vaccination. Blood tests were normal. On July 7 he showed light bruising on the left lower lid, that spontaneously regressed in 7 days. While it was regressing a bruising appeared in a few days in the right side. The bruising presented harder consistency with conspicuous dermal infarction. He was treated with topical chelating agents for more than one month without changes and after 3 months the bruising is still unchanged. No other symptoms or episodes of bleeding and hematoma have occurred.

**Conclusions:**

Cases of apparent secondary immune thrombocytopenia (SITP) after SARS-CoV-2 vaccination with mRNA vaccines have been reported. The case has been referred to a medical commission which received reports of similar reactions after aesthetic procedure.

We suppose that the patients' eyelid complication is the result of the activation of an immunological response that is triggered by vaccination in a biological environment altered.

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