EURAPS

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ABSTRACT BOOK

SESSION 1
RESEARCH

EURAPS

Abstract No.: 330

Title : A Systematic Review of 9,652 Studies Examining The Use Of Deep Learning In Imaging Analysis For Surgery

Introduction:
Deep learning, or machine learning (ML), has profound implications in surgery due to its potential for predicting operative outcomes. The use of ML to identify novel risk factors enables optimized, individual-level care that can prevent postoperative complications or determine the risk-level of a patient to assess whether they should undergo surgery. Our systematic review analyzes clinical studies in surgery that implement ML algorithms in imaging to predict outcomes.

Materials and Methods:
A literature search of PubMed, Embase, Scopus, Compendex, and Cochrane was conducted of retrospective and prospective clinical studies implementing ML algorithms in any surgical specialty between 2000-2021. PRISMA guidelines were implemented for the study. An analysis of ML algorithms, validation techniques, and outcomes was conducted. Descriptive statistics summarized this data.

Results:
Our literature search screened 9,652 studies, of which 104 were included for full-text screening and 39 were included for analysis. Most studies examined CT (41.1%) or MRI scans (23.3%). Single algorithm studies were 51.3% of the cohort, while the remainder used multiple. The most commonly used algorithms were neural network (33.3%), support vector machine (30.8%), and random forest (25.6%), though 46.2% of studies used a custom algorithm. The majority of studies (84.6%) used internal validation to test their ML models, while only 7.7% used external validation with data from other institutions and another 7.7% used no validation. The mean area under curve (AUC) of the validated cohorts for these models was 0.83 (SD 0.10).

Conclusions:
Our results suggest that current research on machine learning for imaging analysis in surgery has constructed proof of concept models with compelling predictive value based on internal data. Future studies should incorporate external validation to explore the generalizability of these models across diverse datasets. In addition, the usage of multiple different types of ML algorithms can be considered to find the superior algorithm.

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Abstract No.: 134

Title : Consulting Dr. ChatGPT: evaluation of ChatGPT's knowledge on common plastic surgery topics and its potential role in patient education compared to Google.

Introduction:
Due to the recent surge in popularity of ChatGPT, patients may turn to ChatGPT for their plastic surgery questions. Thus, we aimed to assess the quality of ChatGPT as a potential source of patient education by comparing the answers to common questions on various plastic surgery topics provided by ChatGPT and Google.

Materials and Methods:
The Google and ChatGPT answers to 10 frequently asked questions on free flaps, breast reconstruction, BIA-ALCL, breast implant illness, body contouring, burn, and wound care were recorded. Between 3 to 5 blinded plastic surgeons selected for their expertise on each topic were then asked to grade the quality of the answers according to the Global Quality Scale(GQS). ChatGPT's concordance with American Burn Association(ABA) and Infectious Disease Society of America(IDSA) guidelines for acute burn and soft tissue infection was also investigated.

Results:
According to the answers provided by Google and ChatGPT on various plastic surgery topics, ChatGPT significantly outperformed Google in each analyzed topic ($p<0.01$). Depending on the topic, the average scores for responses provided by Google ranged between 2.40 and 3.18. The average scores for responses generated by ChatGPT ranged between 4.18 and 4.65.
Corresponding to the GQS, these scores indicate that for Google's responses, some information was present but important topics were missing. ChatGPT's responses were good quality, with most important topics covered. The superiority of ChatGPT's responses was attributed to their comprehensive nature and recognition of existing knowledge gaps. Between ChatGPT, Google, or none, most surgeons wound choose ChatGPT their patients' education.
Furthermore, ChatGPT demonstrated good to high concordance with ABA and IDSA guidelines on acute burns and soft tissue infections management, respectively.

Conclusions:
ChatGPT outperforms Google in providing high-quality answers to commonly asked questions in plastic surgery. We foresee the potential of this technology to revolutionize patient education when used in adjunct to clinical counseling.

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Abstract No.: 172

Title : Improvement of Predictive Scores in Burn Medicine through Various Machine Learning Approaches

Introduction:
Burn injuries are complex, and over the last few decades, multiple scoring systems have been introduced to predict the outcomes and survival of patients with burn injuries. Given the advancements in emergency medicine, intensive care, as well as innovations and new therapeutic methods in burn medicine, it raises the question of whether it is reasonable to continue using scores that were developed more than twenty years ago. The impact of artificial intelligence on medicine and research is undeniable. Therefore, the utilization of machine learning mechanisms for identifying specific data patterns leading to predictive conclusions is a valid method for analyzing patient data.

Materials and Methods:
In this study, data from 1401 patients were analyzed using Classification and Regression Trees, Random Forests, XGBoost, and logistic regression with regard to predictive factors for mortality after burn injuries.

Results:
Through various machine learning mechanisms, factors such as full-thickness burns, patients' age, and the total burned surface area were identified as the most relevant in predicting mortality in patients with burn trauma. The different machine learning mechanisms yielded similar results.

Conclusions:
While machine learning mechanisms produced analogous results, it is crucial to gather more data to conduct a valid analysis. Overall, this study demonstrates that the use of machine learning can contribute to the development of precise predictive scores in the future and even assist in interpreting additional large datasets from registries, thereby having a significant impact on patient treatment.

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Abstract No.: 248

Title : Genetic diagnosis of extracranial arteriovenous malformations through circulating free DNA sequencing.

Introduction:
The role of circulating free DNA (cfDNA) has been largely demonstrated in cancer where it can be used as prognostic marker, biomarker for treatment response or to detect minimal residual disease after treatment. We postulated that due to the high and turbulent blood flow inside extracranial arteriovenous malformations (exAVMs), causing high wall shear stress, damaged endothelial cells could release cfDNA into the peripheral blood circulation.

Materials and Methods:
Inclusion criteria consisted of patients operated for exAVMs and for whom peripheral venous blood samples were taken, either before surgery or after appearance of a recurrence. Causative genetic mutations were identified through panel DNA amplification followed by NGS sequencing from DNA extracted from per-operative tissue samples and after cfDNA extraction out of peripheral venous blood samples collected in Streck® tubes.

Results:
We included 4 patients (P), 3 underwent a complete surgical excision and one had a surgical biopsy. A genetic mutation was identified in all resected tissues (P1: MAP2K1 c.167A>C, 0.24 % VAF; P2: KRAS c.35G>A, 3.3% VAF; P3: MAP2K1 c.171G>C, 5% VAF; P4: MAP2K1 c.167A>C, 7.3% VAF). Peripheral venous blood sample was obtained in 3 patients (P1, P2 and P4) before surgery. The fourth patient (P4) presented with a 4-year local recurrence and blood sample was obtained post-operatively when the recurrence was confirmed. The same genetic mutation was identified in 50% of both the resected tissue and the cfDNA extracted from the peripheral venous blood sample (P1: MAP2K1 c.167A>C, 0.72% VAF; P2: KRAS c.35G>A, 1.80% VAF).

Conclusions:
These preliminary results confirm that cfDNA from the exAVMs can be extracted and sequenced from peripheral venous blood samples in 50% of the cases. This opens the door for a safer precision medicine for the management of these life-threatening fast-flow malformations, for which biopsy can potentially aggravate the lesion.

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Abstract No.: 114

Title : Dielectric Elastomer Actuators for post Paralysis Facial Reanimation

Introduction:
Facial paralysis is a challenging condition, altering a patient's emotions and communication. Restoring movement is crucial for the patient's quality of life. Traditional therapies can include multiple nerve and muscle transfers, which are complex and time consuming. In recent years, using soft artificial muscles as neuro-prosthetics has been explored. The aim of this study is to implement a new strategy for dynamic facial reanimation using a soft artificial muscle, namely Dielectric Elastomer Actuators (DEAs). DEAs are electroactive polymers, showing potential as they are soft, lightweight and allow for large displacements. For this purpose, a realistic humanoid setup and neural interface are implemented, allowing the real-time actuation of the DEA.

Materials and Methods:
A model was created to design and fabricate a realistic humanoid setup. Surface electromyography (EMG) was performed on a healthy participant to record the signal of the zygomaticus major muscle in motion. The EMG signal processing is done in real time using MATLAB and Simulink, thus making it possible to synchronize the DEA's activity with the healthy individual's muscle movements. The displacement of the DEA connected to an anatomically precise humanoid setup was quantified by using a laser displacement sensor.

Results:
The actuators tested when applying a 2 N load present a maximal displacement of 6.2 mm, reaching 89% of the targeted displacement. The analysis of the resulting signals showed a maximum delay of 28 ms between the processed electromyography signal and DEA displacement, and the processing delay was of 108 ms, which can be reduced by implementing a different processing strategy.

Conclusions:
The feasibility of using of artificial muscles for facial reanimation is illustrated by creating an anatomically precise humanoid facial robot setup, showing that the usage of DEA combined with a neural interface presents a promising and significantly less invasive approach for treatment of facial paralysis.

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Abstract No.: 287

Title : Unveiling the Diagnostic Potential of MRI Neurography in Diverse Peripheral Nerve Disorders

Introduction:
Peripheral nerve compression disorders can pose diagnostic challenges when standard diagnostic modalities fail to show an abnormal finding, despite the patient having clinically relevant symptoms on exam. This can make it difficult to determine when to refer the patient for surgery or committing to surgical intervention. This study explores MRIN's diagnostic utility in various disorders. Our aim is to demonstrate the effectiveness of MRIN in guiding surgical decisions, particularly when integrated into an algorithmic approach.

Materials and Methods:
We retrospectively analyzed patients (n=56) with neurogenic thoracic outlet syndrome (nTOS) (7), piriformis syndrome (17), meralgia paresthetica (13), occipital nerve compression (9), and chronic inguinal pain (10) from January 2021 -December 2022 who underwent MRIN as component of the diagnostic work-up to help guide surgical interventions based on the findings. High-resolution imaging identified nerve compression and anatomical abnormalities. Outcomes were assessed for symptomatic relief and surgical success.

Results:
nTOS (n=7), EMG was normal/inconclusive in all, MRIN located compressive structures allowing for accurate diagnosis and brachial plexus decompression and/or neurolysis +/- first rib resection, scalenectomy, pectoralis minor release, targeted muscle reinnervation, relieving all patients. MRIN was positive for sciatic nerve impingement indicating piriformis syndrome (n=15). Piriformis tendon release, neurolysis of gluteal and sciatic nerve led to pain resolution/improvement(83%). In meralgia paresthetica (n=13), MRIN positive for compression of lateral cutaneous femoral nerve (n=7), 6 had symptoms resolution, 1 patient with history of complex regional pain syndrome had persistent pain but still reported symptoms improvement. 1 migraine, positive MRIN showed occipital nerve compression. Neuroma excision, neurolysis and TMR of left GON/LON/cervical nerve were successful. Chronic inguinal pain, positive MRIN (n=9) revealed neuromas in inguinal nerves, triple denervation resulted in 7.5 points mean difference decrease in postoperative mean VAS score.

Conclusions:
MRIN helps confirm peripheral nerve compression disorders and surgical planning by visualizing nerves and identifying compression, enhancing outcomes.

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Abstract No.: 2

Title : The isolated ex-vivo perfused human abdominal skin flap: an alternative method for studying perforasomes and venosomes of the deep inferior epigastric system

Introduction:
The perfusion area (perforasome) of a deep inferior epigastric artery perforator (DIEA-P) and perfusion area (venosome) of a deep inferior epigastric perforator vein (DIEV-P) were evaluated in an isolated ex-vivo perfused human abdominal skin flap model.

Materials and Methods:
15 medial, 18 lateral DIEA-Ps, and 4 DIEV-Ps of lower abdominal adipocutaneous flaps were cannulated and separately ex-vivo perfused with Krebs-Henseleit buffer. Perforasome and venosome perfusion patterns were assessed with infrared thermography (IRT) and indocyanine green fluorescence angiography (ICG-FA) and followed by injection of different coloured dyes into the same vessels to label the perfused skin area and venous exit points. Finally, Omnipaque was injected in these vessels for CTA-3D vascular network reconstruction.

Results:
Perforaome sizes differed considerably between individual medial DIEA-Ps (range 72-361 cm2) and lateral DIEP-Ps (22 – 330 cm2) within the same flap and between flaps. 76 % of the DIEA-Ps drained into SIEV (25/33), while 24 % of the lateral DIEA-Ps (8/33) were draining into both SIEV and SCIV. The drainage route for medial DIEP-P switched towards the contralateral SIEV after occlusion of the ipsilateral SIEV. CTA-3D exposed true anastomotic links between DIEA-Ps when they had a large overlapping colored skin area (11- 82 cm2) or arteriovenous shunts to the superficial venous system. Three DIEV-Ps drained straight into the SIEV, while one created a perfusion pattern on the flap surface and had an extra-venous connection to the subdermal plexus on CTA-3D.

Conclusions:
The use of the isolated ex-vivo perfused human abdominal skin flap model showed that the perfusion of a perforasome of a DIEA-P and the venosome of a DIEV-P are dynamic processes and can be modified by obstruction of the venous route, by pressure changes and by opening of complex vascular interconnections between both systems.

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Abstract No.: 90

Title : Locally applied single-dose antibiotic prophylaxis for implant-based breast reconstruction: Pharmacokinetic evaluation of the duration of effect

Introduction:
Antibiotic irrigation of breast implants is widely used internationally, but no clinical study has investigated the pharmacokinetics in the breast implant pocket. In this prospective study, we determine how long locally applied gentamicin, cefazolin, and vancomycin maintain concentrations in the implant pocket above the minimum inhibitory concentration (MIC) for common infective bacteria and measure systemic uptake.

Materials and Methods:
Patients undergoing implant-based breast reconstruction were recruited from the ongoing BREAST-AB trial, in which they were randomized to implant- and pocket irrigation with 160 µg/mL gentamicin, 2000 µg/mL cefazolin, and 2000 µg/mL vancomycin in a 200 mL saline solution or placebo at Rigshospitalet, Denmark. Samples from the breast drain and blood were obtained up to 10 days postoperatively.

Results:
We included 40 patients who contributed with 146 drain samples and 66 blood samples between October 2021 and September 2022. Vancomycin and cefazolin remained above the MIC for S aureus significantly longer than gentamicin (gentamicin: 0.9 days versus vancomycin: 6.9 days, $P<0.05$, and cefazolin: 3.7 days, $P<0.01$). Gentamicin remained above the MIC for Pseudomonas aeruginosa for 1.3 days. Only cefazolin was detectable in blood samples, albeit in very low concentrations (median: 0.04 µg/mL).

Conclusions:
This study indicates that patients treated with triple-antibiotic implant irrigation during breast reconstruction receive adequate prophylaxis for S aureus and other common implant-associated gram-positive bacteria. However, the protection against P aeruginosa may be inadequate.

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Abstract No.: 61

Title : Is it all in the Topography? Silicone Implant Surface Roughness Modulates Inflammation and Tissue Repair in Capsular Fibrosis

Introduction:
The formation of exaggerated fibrous capsules around silicone mammary implants is complex, primarily driven by immune responses to silicone, involving specific implant topographies and contributing to common long-term complications known as capsular fibrosis. A real-time study with 10 patients explores reduced surface roughness effects, hypothesizing that altering topography reduces early inflammation and capsule formation, potentially improving outcomes compared to conventionally textured implants.

Materials and Methods:
To study this question in humans, breast reconstruction patients received SmoothSilk® (Ra 4 µM) and textured CPX®4 expanders (Ra 60 µM), randomized to left/right breast. In the first five days post-SMI implantation, we investigated immediate inflammatory immune response triggers in the wound bed fluid, comparing surface topography effects on potential antigens, adhesive proteome, and microbiome. Post-expander removal and chronic inflammation drivers were examined in early-stage fibrotic capsules and expander surfaces, assessing surface topography's impact on potential antigens, protein adsorption, biofilm formation, and chronic immune responses. Additionally, postoperative outcomes, including capsule thickness, seroma formation, rippling, implant dislocation, comfort, practicability, and aesthetics, were compared.

Results:
Employing advanced proteomic techniques, we first explored the acute wound proteome within the initial five days post-implantation, revealing a complex composition and dysregulation of signaling pathways associated with immediate inflammation and extracellular matrix turnover. Real-time observations in 10 patients emphasize the significant impact of reduced surface roughness on disease progression, acute inflammation, and fibrosis. Notably, reducing surface roughness to Ra 4 μM emerges as a promising strategy to mitigate detrimental immune reactions and promote healthy wound healing. Direct comparisons between implants with different surface roughnesses confirm that smoother surfaces (Ra 4 µM) lead to reduced fibrotic encapsulation.

Conclusions:
Collectively, our findings contribute to comprehending the interplay between surface topography, immune responses, and long-term outcomes in breast implant surgery, emphasizing the need for a strategic reduction in surface roughness to enhance patient outcomes in SMI procedures.

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SESSION 2

LYMPHATICS, MICROSURGERY & LOWER EXTREMITIES

EURAPS

Abstract No.: 96

Title : Multicenter Randomized controlled trial comparing LVA versus conservative treatment in breast cancer related patients. The first 12 months follow up results

Introduction:
Breast cancer related lymphedema (BRCL) is a chronic condition with a detrimental impact on psychosocial and physical well-being. Lymphaticovenous anastomosis (LVA) has shown promising results in alleviating physical symptoms and increasing quality of life in patients with BRCL. The aim of the study is to evaluate the effect on health related quality of life (HrQol) after LVA surgery versus conservative therapy in patients with BRCL after 12 months.

Materials and Methods:
The study is a prospective, multicenter randomized controlled trial including four hospitals in the Netherlands. Women over 18 years old presenting with unilateral BCRL at the outpatient clinic with early stage lymphedema and viable lymphatic vessels as measured with Near Infrared Fluoroscopy (NIRF), were included. The primary outcome measure was HrQol measured by the Lymphedema Functioning Disability and Health (Lymph-ICF) questionnaire. The secondary outcomes consisted of volume difference measured by the water displacement method (WDW), the Upper Extremity Lymphedema (UEL) index, the patency of the LVA using NIRF was determined after 12 months.

Results:
50 female patients were included per group, 100 in total. There was a statistically significant improvement in the total Lymph-ICF score in the LVA group (-12.17±19.74, p<0.01) in comparison to the CDT group score (-7.11±17.54, p>0.05). There was no significant difference in volume in both groups measured using WDM (∆relative WDM; LVA-group: 8.95, p=0.779, CDT group: 29.66, p=0.334) and UEL index (∆Absolut UEL; LVA-group: 1.14, p=0.374, CDT group: 2.23, p=0.147). 82% of the LVAs were patent and discontinuation rate of compression garments was higher in the LVA group than in the CDT group.

Conclusions:
Lymphaticovenous anastomosis resulted in improvement in the total Lymph-ICF score in patients with BRCL and higher discontinuation rate of compression garments. However, improvement of limb volume and limb circumference could not yet be evidenced after 12 months.

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Abstract No.: 103

Title : Efficiency of photoacoustic lymphangiography for preoperative mapping in patients undergoing lymphaticovenular anastomosis

Introduction:
Lymphaticovenular anastomosis (LVA) is a surgical procedure to alleviate lymphedema. Accurate identification of lymphatic vessels and veins is crucial for successful surgical outcomes. Photoacoustic lymphangiography (PAL) is a new optical imaging technique with a resolution of 0.2 mm, allowing for more precise evaluation of lymphatic vessels and veins compared to previous modalities; however, its usefulness has not been discussed yet. Thus, this study aimed to assess the positive effect of preoperative mapping using PAL.

Materials and Methods:
We performed PAL using the LUB0 (Luxonus inc., Japan) for lymphedema patients scheduled for LVA. The identification time of the vessels were measured to evaluate the usefulness of PAL by observing the microscope's video. Some sites were excluded because of incomplete records or the LVA not being performed by a single surgeon. Patients who underwent surgery at our hospital in the last 2 years and were evaluated with a conventional modality alone were enrolled as the control group.

Results:
A total of 14 lymphedema patients (2 male) were enrolled in the PAL group. All patients had secondary lymphedema of the lower extremity. All lymphatic vessels were identified in all 41 sites where LVA was measured with an average identification time of 9 minutes 44 seconds. On the other hand, 12 patients and 22 LVAs were selected and the average identification time was 12 minutes 35 seconds (p=0.06).

Conclusions:
PAL can produce clear images and identify lymphatics and veins simultaneously. Thus, although no significant time difference was noted with the use of PAL, the vascular tracts were identified relatively quickly.

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Abstract No.: 300

Title : Long-term outcomes of lymphedema treatment with combined lymph node transfer and collagen scaffolds

Introduction:
Vascularized lymph node transfer (VLNT) accelerates growth factor secretion, lymphatic endothelial-cell migration towards the interstitial flow, and lymphangiogenesis in a multidirectional pattern. Our study aims to examine the hypothesis that nanofibrillar collagen scaffolds (NCS) combined with VLNT can provide guided lymphangiogenesis and create new stable lymphatic pathways.

Materials and Methods:
Twenty-four patients (22 female, 2 male) suffering from upper (n=10) or lower limb (n=14) secondary lymphedema, were equally divided into two groups; Group-A patients (mean age 49years, mean body mass index-BMI 28) underwent a VLNT, while Group-B patients (mean age 50years, mean BMI 26) underwent a combined VLNT and NCS procedure. Lymph-node flap sizes, harvesting procedure, and implantation location were similar in both groups. Demographics, lymphedema etiology and staging, limb volumetry, and somatometric data were recorded. Pre- and postoperative data for limb-volume difference (Vd), infection episodes/year, and indocyanine-green (ICG) lymphography changes were documented in all patients.

Results:
Mean follow-up was 42 months (24-60) in Group-A, and 22 months (12-48) in Group-B patients. Demographic data, lymphedema etiology, and staging was similar in both groups. Pre- and postoperative Vd for Group-A was documented as 36.4% and 24.5% ($p<0.0001$), while in Group-B 32.5% and 13.6% ($p<0.0001$) respectively. ICG mean stage in Group-A was 3.6 pre- and 3 postoperatively ($p=0.02$), and 3.6 pre- and 2 postoperatively in Group-B ($p=0.001$). A statistically significant difference was found in postoperative Vd between the two groups ($p=0.001$) as well as the postoperative ICG changes ($p=0.001$). The mean number of infection episodes decreased in Group-A and B from 1.75 to 0.3 and from 2.1 to 0.4 per patient/year, respectively. ICG-lymphography findings showed new lymphatic vessel formation at the location of NCS implantation.

Conclusions:
Long-term follow-up of the patients treated with a combined VLNT-NCS approach showed a statistically significant improvement regarding volume reduction, ICG downstaging, and new lymphatic vessel formation, compared to VLNT alone.

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Abstract No.: 34

Title : PROMs after lymphatic reconstructive surgery: Is there a correlation between volume reduction and quality of life?

Introduction:
Patients with upper limb lymphedema (ULL) and lower limb lymphedema (LLL) suffer from a wide range of physical as well as psychological symptoms that affect quality of life (QOL). The benefits of lymphatic reconstructive surgery for patients with lymphedema are undisputed. However, recording volume reduction alone may be insufficient with regard to postoperative outcome because measurements are often inadequate, depend on many factors, and do not reflect improvement in quality of life.

Materials and Methods:
We conducted a prospective single center study patients receiving lymphatic reconstructive surgery between February 2020 and September 2022. Patients received volume measurements preoperatively and at standardized postoperative intervals. To evaluate patient-reported outcomes (PROMs), patients completed the following questionnaires: LYMPH Q Upper Extremity Module, quickDASH, SF 36, LYMPH-ICF-LL and LEFS at the aforementioned intervals.

Results:
So far, we included 55 patients with ULL (24%) and LLL (73%) of lymphedema grades I-III with a mean age of 43.7 years (± 17.3). Patients received lymphovenous anastomosis only (23%), free vascularized lymph node transfer (35%) or a combination of both (42%). Analysis of PROMs revealed improvements with respect to a broad range of complaints, particularly physical function, symptoms and psychological well-being. There was no correlation between the extent of volume reduction and improvement in QOL (Pearson correlation coefficient below ± 0.7; $p > 0.05$).

Conclusions:
This study is unique in terms of the broad range of physical and psychological complaints covered by the use of different PROMs. The thorough analysis of the different PROMs, demonstrates that surgeons should rely on disease specific PROMs such as the LYMPH-ICF-LL and the LYMPH Q. Most importantly we can conclude that there is no correlation between volume loss and QOL which underlines the paramount importance of lymphatic reconstructive surgery for patients and emphasizes the need to include PROMs to assess the postoperative outcome.

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Abstract No.: 104

Title : Early experience: Prophylactic Lymphedema Surgery for Lower Limb Soft Tissue Sarcomas

Introduction:
Oncological treatments, such as radiotherapy and surgery, are high-risk factors for the development of secondary lymphedema in the upper and lower limbs, as well as the genitalia. Prophylactic lymphedema surgery (PLS) has previously demonstrated promising results in reducing secondary lymphedema in breast cancer and urogenital cancer patients. We conducted a study to adapt this principle for patients with lower extremity sarcomas.

Materials and Methods:
Inclusion criteria included patients with tumors on the medial aspect of the thigh and leg, tumor size larger than 5 cm. Group A (27 patients) constituted a retrospective cohort (2017-2020) without PLS reconstruction, where the prevalence of lymphedema was determined. Group B (19 patients) comprised a prospective cohort (2020-2023) in which a PLS protocol was executed. Lymphaticovenous anastomosis (LVA) was performed when lymphatic channels were interrupted due to tumor resection, intraoperatively verified by indocianine green (ICG). Lymph node transfer (LNT) was employed exclusively in cases involving preoperative radiotherapy and inguinal lymph node resection. Measurements were collected both preoperatively and at 1, 3, 6, and 12 months postoperatively.

Results:
In total, we enrolled 45 patients with soft tissue sarcomas located on the inner aspect of the thigh and leg (27 in the control group vs. 19 in the prophylactic group). In the control group, lymphedema was observed in 10 out of 27 patients (37.04%). In the prophylactic group, two patients exhibited signs of lower extremity lymphedema (2/19, 10.52%) with a median follow-up of 14.15 months (6 months - 33months), demonstrating statistically significant differences between the two groups (p=0.02931).

Conclusions:
PLS for lower limb soft tissue sarcomas shows promising results, although it is premature to reach solid conclusions. Multicenter studies, standardization of criteria, larger sample sizes, and longer-term follow-up are imperative for further validation

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Abstract No.: 295

Title : Application of a Novel Wristed Micro-Instruments Robotic System for Precision Reconstructive Super-Microsurgery: An Initial Single-Center Prospective Study on 66 Consecutive Lymphatico-Venous Anastomoses

Introduction:
We present our clinical experience with an advanced robotic system featuring state-of-the-art wristed microsurgery instruments designed to enable and enhance precise reconstructive microsurgery and supra-microsurgery.
Primary objective was to evaluate the safety, feasibility, operative efficacy, and post-operative results, secondary to assess potential advantages and limitations of robotic lymphedema super-microsurgery.

Materials and Methods:
During 6 months, 22 surgical cases were performed, primary and secondary lymphedema, upper and lower limbs, ISL stages II-III. All patients had previously complete decongestive therapy (mean 10,4months).
Symani MMI robotic system was used with an operating microscope. Primary outcome measures were anastomosis type, vessel size, anastomosis time, robotic set-up time, knots/anastomosis, microsutures/patient, intra-operative LVA patency, need to redo, intraoperative complications, technical difficulties. Postoperative interlimb volume reduction, wound healing, and patient-reported outcome measures were recorded. Secondary outcomes measured learning curve, ergonomics and surgeon fatigue.

Results:
54 robotic anastomoses and 12 handsewn were completed in 22 patients (average 3/patient, range 2-5). HandsewnLVA were performed in anatomical locations where the optical microscope-robotic platform could not be deployed. Mean vein and lymphatic diameter were 0,6mm (range 0,2-1,5mm) and 0,51mm (range 0,15-1,2mm). Mean roboticLVA anastomosis was 22min versus 7,6min for handsewn. Mean video-documented robotic time/knot was 3,4min versus 1,6min for handsewn. Average roboticLVA time decreased 39% between first five and last five patients. Immediate anastomosis patency was 97%, and a robotic re-do was performed in 2 LVAs. Mean follow-up time was 119 days. 7 days post-operative mean interlimb volume reduction was 9,6% with no LVA-related complications. Where measured, 3-months interlimb volume reduction remained the same or better than at 7 days. Suture usage increased threefold for roboticLVA. Surgeon perceived ergonomics during roboticLVA improved during first 12 cases but remained inferior to handsewn.

Conclusions:
This novel robotic system is safe and feasible, significantly enhancing surgical precision. Multi-center prospective randomized control studies are required to determine roboticLVA cost-efficiency.

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Abstract No.: 31

Title : Using Frailty and Hypoalbuminemia to Predict Outcomes Following Free Flap Reconstruction: A Retrospective Cohort Study of 34,571 Patients

Introduction:
Frailty, which can be defined using the modified frailty index 5 (mFI-5) score, is a significant risk predictor in surgery. Hypoalbuminemia (albumin <3.5 g/dL) has also been linked to poor perioperative outcomes. The interrelationship of the two has not been established. In this multicenter, retrospective cohort study we investigate the correlation between preoperative albumin and frailty, and its ability to predict free flap reconstruction outcomes.

Materials and Methods:
The ACS-NSQIP database was searched from 2008 to 2021 to identify all patients who underwent free flap reconstruction. We collected peri-operative data on demographics and pre-operative lab values, including albumin, and post-operative 30-day outcomes including mortality, length of hospital stay, reoperation, medical and surgical complications, and discharge destination. The outcomes were assessed with multivariable linear and logistic regression models.

Results:
34,571 patients were identified, of which 22,363 (64.7%) were non-frail (mFI=0), 9,466 had a frailty score of 1 (27.4%), 2,505 a score of 2 (7.2%), 226 a score of 3 (0.7%) and 11 a score greater or equal to 4 (0.0%). Albumin levels were available for 16,250 patients (47.0%), of whom 1334 (8.2%) had hypoalbuminemia. Regression analysis identified that higher mFI scores independently predicted any, surgical and medical complications, reoperation, unplanned readmission, and longer hospital stays. Hypoalbuminemia independently predicted any, surgical, and medical complications, mortality, reoperation, and longer hospital stays. Combined assessment (mFI-5+Alb) was the most accurate predictor of all major outcomes (any, medical and surgical complications, mortality, reoperation). Albumin levels and mFI scores weakly correlated (Spearman R: -0.1; <0.0001).

Conclusions:
Pre-operative hypoalbuminemia is independently associated with post-operative outcomes, that do not correlate with frailty. Similarly, higher mFI scores predict outcomes not associated with hypoalbuminemia. We therefore recommend, for patients undergoing free flap reconstruction, consideration of both the pre-operative frailty score and albumin levels to optimize perioperative planning, including pre- and post-habilitation and mobilization of multi-disciplinary care.

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Abstract No.: 128

Title : International Lower Limb Collaborative (INTELLECT) study: a multicentric, international retrospective audit of lower extremity open fractures.

Introduction:
Open lower extremity fractures are severe, life-changing events, however no previous studies have reported how these injuries are treated from a global perspective.

Materials and Methods:
An international, multi-centric, retrospective cohort study was designed to identify disparities in management and outcomes of open lower limb fractures in different healthcare settings. Demographic data, injury mechanism, retrieval pathway, time to surgical interventions, modalities for bony fixation and soft tissue reconstruction was collected using secure REDCap instrument. Main outcomes were incidence of wound infection, deep infection, non-union and amputation.

Results:
62 centres in 16 countries contributed with 2,694 open fractures cases, including 272 femur, 2,131 tibial and 291 hindfoot injuries. Mean age was 44.5 years and 71% were male patients, with 53% of the injuries being caused by road traffic accidents. Wound infection was reported in 16.3%, deep tissue infection in 10.3% and non-union in 10.9%, with an overall amputation rate of 5.8%. Males presented a higher proportion of high-energy injuries (p=<0.001). For each day that wound closure was delayed there was a 1% increase in the likelihood of developing a wound infection and 2% for deep infection. A joint ortho-plastic approach reduced the likelihood of requiring an amputation (OR=0.41, p=0.008). Being treated in a country with clinical guidelines was a protective factor for developing deep infection and non-union (OR=0.66, p=0.04).

Conclusions:
There are significant disparities on the management of open lower limb fractures internationally. A timely, multidisciplinary, guideline-directed care is a protective factor for developing infective complications, non-union and requiring an amputation.

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Abstract No.: 297

Title : Orthoplastic lower extremity reconstruction in a major trauma centre: Clinical outcomes from local perforator-based flaps versus free flaps

Introduction:
Orthoplastic lower extremity soft tissue reconstruction is a challenging field of reconstructive surgery. Utilisation of free flaps has become the ‘gold standard’, however, free flaps require microsurgical techniques, expertise, and an equipped team. Advancements in lower extremity angiosomes and perforasomes led to the evolution of perforator-based flaps as potential alternatives soft tissue transfer. The aim of this study is to present the types of reconstructions and clinical outcomes of orthoplastic lower extremity reconstruction in one of Europe’s largest major trauma centres.

Materials and Methods:
A prospective case series was conducted on all lower extremity open fractures admitted to our major trauma centre. Patients requiring orthoplastic lower extremity soft tissue reconstruction were included in the analysis. Patient demographics, types of flaps, clinical indications for soft tissue reconstruction and clinical outcomes including partial or total flap failure and requirement for revision were analysed.

Results:
Three hundred seventy (370) lower limb open fractures were admitted at our major trauma centre between November 2020 - June 2023. 253 (68.4%) required no soft tissue reconstruction and after debridement were primarily closed. 117 (31.6%) required soft tissue reconstruction with 55 (47%) requiring local perforator-based flaps (keystone, propeller, advancement, transposition) and 62 (53%) requiring free flaps (ALTs, TDAPs, SCIPs, LDs, MSAPs). The rate of complications for local flaps was 1.8% for partial failure, 3.6% for total failure and 3.6% for flap revision. The rate of complications for free flaps was 6.5% for partial failure, 3.2% for total failure and 1.6% for revision surgery.

Conclusions:
Our experience demonstrates that local perforator-based flaps can prove robust, however, they require meticulous pre- and intra-operative radiological mapping alongside with meticulous microsurgical perforator or pedicle dissection to allow more predictable outcomes. Free flaps are considered the ‘gold standard’ and the most effective and versatile technique in orthoplastic lower extremity reconstruction.

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Abstract No.: 318

Title : Redefining the vascular anatomy of the medial gastrocnemius muscle: A computed tomography angiography study

Introduction:
The medial gastrocnemius muscle flap is a historical option in lower limb reconstruction. The flap is proximally based on the medial sural artery and it is assumed not possible to harvest a distally based flap. However Masquelet reported a case of a distally based medial gastrocnemius flap. The aim of this retrospective Computed Tomography Angiography (CTA) study was first to confirm the presence of the branch nourishing the distal gastrocnemius muscle and second to describe its vascular anatomy, its localization, size, origin and connection with other branches given off by the posterior tibial artery(PTA)

Materials and Methods:
A retrospective study was performed of 120 limbs (60 patients) who underwent CTA for a variety of indications between April 2018 and June 2020. 3D reconstruction was performed to delineate the course, the length and the diameter of the distal secondary pedicle, if present. The distance of the pedicle, if found, from the intermalleolar line to the patella was noted. The number of pedicles, if multiple, were documented, as well as branches to the soleus muscle and the skin.

Results:
A distal pedicle to the gastrocnemius muscle was found in 64% of limbs. The average pedicle location from the intermalleolar line is of 169 mm. The branching pattern from the PTA showed an isolated vessel going to the distal medial gastrocnemius (32.8%), two branches to medial gastrocnemius and skin (39.3%), two branches to medial gastrocnemius and soleus (24.6%) and three branches to medial gastrocnemius, soleus, and the skin (3.3%).

Conclusions:
This study confirms the presence of the secondary axial distal pedicle of GN muscle. Furthermore, this study confirms that there is a likely association between the distal medial gastrocnemius pedicle and the PTA skin perforators. This middle perforator of the skin of the PTA is present in an area from 13 to 18 cm from the medial malleolus.

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SESSION 3
BURNS AND SKIN

EURAPS

Abstract No.: 25

Title : Mortality Prediction in Intensive Care Burn Patients: Comparative Analysis of Composite Scores

Introduction:
Various scoring models have been used in predicting mortality in burn patients. Nonetheless, their prognostic ability has not been evaluated despite the recent trend of declining mortality rates in European burn centers. We aimed to compare the accuracy of five of the most established models for mortality prediction in burn patients and to assess current risk factors associated with mortality.

Materials and Methods:
Intensive care burn patients admitted between March 2007 and December 2020 with total body surface area (TBSA) affected ≥ 10% were analyzed. Multivariate analysis was conducted to examine variables associated with mortality. The ABSI, Ryan, BOBI, revised Baux and BUMP scores were analyzed by receiver operating characteristics. A total of 617 patients were included.

Results:
Mortality was 14.4%, with non-survivors being significantly older, male, and having experienced domestic burns. Multivariate analysis identified age, TBSA, full-thickness burns and renal insufficiency as independent mortality predictors. The newly introduced BUMP score presented the highest mortality prognostication rate, followed by ABSI, revised Baux, BOBI and Ryan scores. BUMP, ABSI and revised Baux scores displayed AUC values exceeding 90%, indicating excellent prognostic capabilities.

Conclusions:
The BUMP score showed the highest accuracy of predicting mortality in intensive care burn patients and outperformed the most commonly used ABSI score in our cohort. It may be superior in the long-term prognostication of burn patients and deliver more accurate results for research purposes. The older models displayed adequate predictive performance and accuracy compared with the newest model.

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Abstract No.: 91

Title : Balancing regenerative medical approaches and flap surgery in the treatment of burn injuries and their sequelae

Introduction:
Regenerative medicine offers legitimate solutions in plastic and reconstructive surgery. The treatment of thermally inflicted wounds may benefit from the less invasive regimen. Herein, the value of classic reparative techniques including flap surgery and the merits of regenerative medicine for acute injuries and post-injury sequelae are discussed.

Materials and Methods:
Acute burn injuries were treated with isolated fat-derived stromal vascular fraction cells (SVF) and platelet-rich fibrin (PRF) upon enzymatic debridement and the clinical outcome was evaluated retrospectively. Furthermore, the use of various biological and synthetic dermal substitutes for the treatment of burn scars was investigated retrospectively. Outcomes were compared with the standard treatment consisting of skin grafts for acute injuries and flap surgery for burn scar reconstruction.

Results:
Thirteen patients underwent SVF therapy. The use of SVF did not provide stable outcomes, re-excision and skin grafting was required in 38.46% of patients. No specific confounders for therapy failures were identified. Dermal substitutes were used in 30 patients and showed favorable vascularization and granulation in static areas. For the reconstruction of joints, however, the rate of major complications such as re-contractures or loss of transplants was high (43.33%). Here, thin perforator flaps showed superior results. Vascularized fascial slings help in the anchoring of perforator flaps in the axilla. Furthermore, robot-assistance simplifies anastomosis in difficult-to-reach areas such as the axilla.

Conclusions:
Based on the current experience, no reliable regenerative medical alternatives to skin grafting for the treatment of deep acute burn injuries are accessible. Dermal substitutes offer feasible solutions for static areas and can act in salvage situations. For critical areas including joints and the neck, thin perforator flaps are the mainstay in the treatment course. In the future, advanced tissue engineering concepts such as epidermal-dermal constructs may render novel opportunities.

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Abstract No.: 173

Title : Which social and enviromental factors influenced pediatric burns? Population-based study.

Introduction:
The purpose of this study was to evaluate the epidemiological characteristics and access to care of pediatric burns patients admitted to a single burn unit. In particular, our goal was to assess whether differenes exist between the severity and treatment of children who sustain burns in rural or urban areas and the presence of a complete or incomplete family.

Materials and Methods:
A retrospective analysis of all pediatric burn patients (<18 years old) admitted to a single burn unit, from 2005-2022, was performed.

Results:
2604 children met the inclusion criteria, of which 34.3% came from rural regions. Patients were transported to the specialized burn center using a number of modalities including 47.7 % by the ambulance, 16 % by air, and 28.3 % by private car. Only 82 % of children from the rural region were transported to the specialized burn center on the day of the injury. Surprisingly, similar percentages were seen from urban regions. Children from complete families (both parents living together) were transported to the burn center faster than children from single-parent families (P=0.002). First aid was more commonly performed for children from complete families (P<0.001). Children from incomplete families sustained more burns on the genitals (P=0.001) and lower limbs (P=0.005). The probability that a child from a rural area will have a burn caused by a flame is 1.39 times higher than for children from urban regions. The probability that a child from an urban area will have a burn caused by electric current is 2.3 times higher than for children from a rural area.

Conclusions:
Epidemiological studies of pediatric burns is critical to understanding the scope of the problem, identifying risk factors, evaluating interventions, and developing prevention strategies to reduce the incidence and impact of burn injuries in children.

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Abstract No.: 190

Title : Reconstruction of Severely Burned Breast

Introduction:
Burns to the pediatric population are a prevalent problem that can have long-term consequences.
Although burns to the trunk have equally negative cosmetic effects from disfigurement for both boys and girls, burns to the trunk of the developing female, particularly those involving the breast, have an additional psychologic component due to the potential loss of femininity. This article aims to comprehensively review the proper reconstructive management for these patients and to suggest staged reconstructive algorithm for these challenging cases.

Materials and Methods:
Between 2003-2023, 17 patients with severe scarring of the breast and surrounding tissues. The age at presentation was 5 - 21 years. Only patients that presented with variable degrees of breast mal-development and deformity were included in this study. All patients in this group revealed variable degrees of chest wall and abdominal wall scarring beyond the breast footprints

Results:
Our approach was a staged reconstruction performed in two major stages. During the first stage, resurfacing of the breast and the surrounding areas was performed using expanded flaps.During this stage, we have evaluated the existing breast volume, preserved existing breast tissue and mobilized the mal-positioned nipple-areola complex. This stage was performed early (before puberty).
The second stage, performed after puberty, consisted of implant-based breast reconstruction and symmetry procedure to the other breast.

Conclusions:
This article suggests a novel approach to reconstruction of the severely burned breast. In such, resurfacing is performed early as part of chest wall and abdominal wall reconstruction. The breast tissue is preserved, and NAC is preserved and mobilized to a correct location. Breast reconstruction with prosthesis combined with contralateral augmentation is performed in second stage to achieve symmetry and more pleasing breasts. Longer follow-up is still needed for many of these patients given many of them will reach mature breast growth only in the future.

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Do you have any disclosures?	No

Abstract No.: 135

Title : Complications Following Free Flap Reconstruction in Acute Burn Patients: A 12-Year Single-Center Experience and Systematic Review and Meta-Analysis of the Literature

Introduction:
Free flaps are seldom employed and usually considered the last resort in acute burn reconstruction and there is a paucity of literature on the topic. The aim of the study is to describe outcomes of free flaps in acute burns at a single institution and review their failure rates in the literature, especially regarding how timing affects outcomes.

Materials and Methods:
A retrospective cohort study was conducted to review all patients who underwent free tissue transfer for burn-related injuries at our institution between 2012 and 2023.
A systematic review and meta-analysis was reported according to PRISMA guidelines and registered on PROSPERO database (CRD42023404478). PubMed, Embase, Web of Science, and Cochrane Library were accessed. Only free flaps in acute burns were included.

Results:
11 patients required a free flap for their acute reconstruction at 25.412.4 days from day of injury. Patients were 69% males and 31% females, with a mean age of 45.516 years. The mean follow-up time was 13.513.9 months. Overall complications rate was 54%, with 15% rate of total flap loss. 38% of the patients required re-operations.

In literature, 454 free flaps were performed for acute burn reconstruction in 427 patients, with a total flap loss rate of 9.91% [95%CI: 7.48%-13.02%]. Data on acute burn reconstruction timing was available for 275 flaps performed in 260 patients. The pooled prevalence of free flap failure in three different time intervals (0-4 days, 5-21 days, 22 days-6 weeks) was 7.32% [95%CI: 2.38%-20.37%], 16.55% [95%CI: 11.35%-23.51%], and 6.74% [95%CI: 3.06%-14.20%], respectively.

Conclusions:
Free flap reconstruction carries a high risk of complications and should be considered only as a last resort for limb or life-threatening situations. However, the timing of the reconstruction appears to influence surgical outcomes. Free flap reconstruction performed between day 5 and day 21 from burn injury had a trend towards higher flap loss rates.

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Abstract No.: 68

Title : Fluorescent Light Energy and wound healing: a good news?

Introduction:
Since ancient time, the light has been considered as treatment in order to promote wound healing In the last years a new kind of technology has been approved on the market. Previously known as biofluorescence or photobiomodulation, nowadays the Fluorescent Light Energy (FLE) is based on the unique ability of light accepting molecules (chromophores) to translate light emission from a lamp (LED blue lamp) in a different photons emission with broader wavelengths spectra and lower energy (fluorescence). This technology permits to stimulate both exogenous chromophores, through a gel directly applied on the wound bed, and endogenous chromophores, activating the wound healing process. The blu light, indeed, is translated in different colors (yellow, green and orange) with consequent impact on all skin layers (epidermis, papillary and reticular dermis). Here we present our experience with FLE in patients affected by chronic and acute wounds.

Materials and Methods:
We enrolled 50 patients affected by chronic or acute wounds as vascular ulcers (30 patients), II degree burns (20 patients).After obtained informed consent we performed pictures and we treated the lesions with FLE for 5 minutes twice a week. After debridement (if required) a gel containing chromophores has been applied on wound bed and activated by a multi LED blu lamp. The median number of sessions has been 10. All the patients have been treated in hospital as recovery or as outpatient.

Results:
All the treated patients reported an improvement in wound healing with a complete rehepithelization in 90% of the cases. In the last 10 % the treatment prepared the wound bed to surgery (skin graft). We also noted the stimulation of melanocytes in high skin phototype

Conclusions:
In our experience FLE has been an unpainfull treatment with an high compliance of the patients. The study confirmed its efficacy in inducing healing or preparing the wound bed to surgery.

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Abstract No.: 42

Title : Faster healing of torpid venous ulcers treated with atmospheric cold air plasma jet: clinical trial.

Introduction:
Venous ulcers (VU) are very common in clinical practice, consuming large amounts of time and resources. VUs also tend to chronicity and recurrence distinctively. The novel use of cold plasma (fourth state of matter) using inert gases such us argon has a limited results when used in VUs. We proposed the use of cold plasma generator with a flow of air at atmospheric pressure instead of inert gases in the treatment of VUs. The mechanism of action of the healing process is by means of a bactericide and neoangeogenic effect.

Materials and Methods:
We present the analysis of a randomized clinical trial, controlled with the conventional treatment for VUs, based on the application of alginate with silver and an absorbent dressing. A total of 68 patients (34 patients per group) have been recruited with a VU whose healing has not been achieved in the previous four weeks. Each patient has received 10 weeks of treatment (twice a week) followed by 8 weeks of follow-up. The program ImageJ2 has being used to quantify the healing rate of the lesions and cultures of the wounds were also performed.

Results:
A decrease in the area of the ulcers (70%) compared to alginate treatment has been found and three times faster recovery was observed. Moreover, a significant reduction in the microbial load (95% fewer colony-forming units) respect to the alginate group. No adverse effects in any patient were reported during treatment or the follow-up period.

Conclusions:
The use of cold plasma using air at atmospheric pressure is a safe and useful treatment for VUs. As demonstrated cold athmospheric plasma induces a faster and better healing of VUs compared to classical dressings.

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Abstract No.: 113

Title : Aplasia Cutis: From Diagnosis to Management- Two Decades of Clinical Insights

Introduction:
Aplasia Cutis Congenita (ACC) is a rare congenital disorder characterized by the absence of skin layers, often occurring on the scalp. This anomaly poses considerable challenges due to its varied presentations, complications, and associated anomalies, necessitating meticulous assessment and management strategies to optimize patient outcomes.

Materials and Methods:
This 20-year retrospective study (2000-2022) analyzed aplasia cutis congenita (ACC) cases at the Plastic and Reconstructive Surgery Department, Soroka Medical Center, utilizing an algorithm published 20 years prior. The meticulous analysis included newborns diagnosed with ACC, emphasizing defect characteristics and management outcomes. The data, evaluated through our proposed classification system and statistical analysis, underscored the sustained efficacy of the algorithm in managing ACC, offering insights into optimized patient-centered approaches and indicating avenues for further refinement in future interventions.

Results:
In the meticulous examination of aplasia cutis conducted on 102 initial cases, a refined cohort of 66 patients was scrutinized due to adequately documented medical records. A nuanced algorithm was developed to cater to the diversified clinical and anatomical presentations, focusing primarily on defect location, size, layers involved, and associated anomalies. The algorithm's implementation showed surgical intervention was crucial in 6.6% of cases, especially those under Type II and Type III, which exhibited complications like large blood vessel exposure and concurrent bone absence. Impressively, successful wound healing trajectories were exhibited in all patients with minimal complications, and reoperation was necessitated only in two instances due to bleeding events.

Conclusions:
Ten years post the implementation of the devised algorithm, we conclude it has been instrumental in enhancing diagnostic accuracy and optimizing treatment strategies, proving pivotal for plastic surgery specialists in understanding the varied presentations of aplasia cutis. The minimal complications and successful healing trajectories affirm the algorithm’s efficacy in fostering improved, patient-centered outcomes and advancing the knowledge and management strategies in dealing with aplasia cutis.

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Abstract No.: 176

Title : Wide local excision for thin melanomas: is it always necessary?

Introduction:
According to the current international guidelines for cutaneous melanomas, wide local excision (WLE) involves widening the excision margins from 0.5 cm to 2 cm depending on the Breslow thickness of the primary melanoma. While this surgical procedure may have actual oncological benefits in terms of radicality, it is burdened by potential general complications and significant hospital costs.
In the case of thick lesions, the risk-benefit ratio of this procedure may be favorable, but in thin melanomas or in situ variants, the actual utility of performing the procedure to contain disease progression remains debated.
The aim of the study is to assess the incidence of residual disease in histological samples after enlargement in in situ and thin melanomas, as well as the local, regional, or systemic disease progression.

Materials and Methods:
This retrospective monocentric study involved the reexamination of histological samples after wide local excision of in situ and thin melanomas in order to assess the incidence of local disease persistence. Disease-free survival and specific mortality were compared between the group of subjects with negative WLE and those with positive WLE

Results:
Out of 521 examined samples, the percentage of local progression was 2% for melanomas with a thickness of less than 1mm and 7% for melanomas with a thickness of less than 2mm.

Conclusions:
The preliminary data from this study have shown that in the case of thin melanomas (less than 1mm), WLE may not be necessary. Further multicentric studies will be required to potentially amend the current guidelines on the surgical treatment of melanoma.

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Abstract No.: 256

Title : Sentinel metastases patterns for trunk malignant melanoma: a 3D mapping model

Introduction:
Malignant melanoma is a significant cause of morbidity and mortality worldwide. Despite not being the most common type of skin cancer, its incidence is steadily increasing. Sentinel lymph node biopsy (SLNB) is performed in newly diagnosed patients for staging and treatment planning. In cases of trunk melanomas, predicting the drainage to which lymph node region they will migrate is more challenging compared to extremity or scalp melanomas. This feature deems melanomas of the trunk with a worse disease course. This study aimed to retrospectively explore, based on our clinical experiences, which sentinel lymph nodes trunk melanomas might drain into.

Materials and Methods:
In this study, a total of 51 patients diagnosed with trunk-located melanoma who underwent SLNB were analyzed. Primary tumors and the scars of patients who had previously undergone excisional biopsies with a pre-diagnosis of malignant melanoma were proportionally represented on a coordinate system. Grid calculations were derived from standard human measurements and a three-dimensional representation of the human body was generated. Different colors were assigned to represent the areas where lymph node metastasis occurred in four regions. A coloring technique symbolizing the metastatic areas was utilized.

Results:
Melanomas located above the umbilicus tend to drain to the axillary region ($p<0,05$). Melanomas located along the vertical axis, on the midline, can drain to both the right and left axillary or inguinal regions ($p> 0,05$). However, melanomas around and below the umbilicus typically exhibit dual drainage, with drainage to both the ipsilateral axillary and inguinal regions.

Conclusions:
In the case of trunk melanomas, sampling in SLNB is particularly crucial due to the uncertainty of lymphatic drainage. This study highlights the importance of conducting postoperative follow-up assessments with bilateral axillary and inguinal ultrasound examinations for patients.

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Abstract No.: 99

Title : The “No Man's Land” of Nasal Subunits: A Case Series and Algorithm for Reconstruction

Introduction:
The area in the lower third of the nose that resides between the tip and ala is a small area of concavity between two convex subunits. It lies adjacent to the soft triangle and the nasal sidewall. The senior author has termed this area the “no man's land” of nasal reconstruction as it does not fall within any of the nine subunits. The subunit principle and potential reconstruction algorithms for specific subunits have been thoroughly discussed in the literature, but this area at the junction of these four subunits has not despite it being one of the most challenging areas to obtain an optimal aesthetic outcome.

Materials and Methods:
Data was collected retrospectively from the medical records of patients who underwent nasal reconstruction of wounds involving the area described as “no man's land” between 2012 and 2023.

Results:
A total of 49 patients underwent nasal reconstruction in “no man’s land”. Cases were categorized based on defect size, nasal subunits involved, distance from the alar rim, reconstructive technique performed, and need for cartilage grafts. Five surgical techniques were utilized as treatment, the most common being a paramedian forehead flap in 24 cases, followed by nasolabial with 11 cases, bilobed flaps in 9, full thickness skin graft in 4 and V-Y flap in 1. Ear and septal cartilage grafts were required in 24 and 1 cases respectively. An algorithm was developed to assist in choosing the best reconstructive technique based on the characteristics of the defect, based on experience and this series.

Conclusions:
We describe the “no man’s land” of nasal reconstruction as the area at the junction of the nasal tip, ala, soft triangle, and sidewall, and we discuss the specific challenges that this area poses. An algorithm is also presented to guide the surgeon in decision making for defects in this area of the nose.

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Abstract No.: 236

Title : A 3-step combined technique for correction of lower involutional eyelid malpositions based on a common eyelid pathophysiology.

Introduction:
Involutional entropion and senile ectropion of the lower eyelid are common eyelid disorders of the elderly population. Both disorders result from a common pathophysiology consisting of a mechanical imbalance between anterior and posterior lamella and eyelid lengthening. This study aims to assess the effectiveness of a new 3-step combined procedure based on the mechanical balance principle in treating involutional entropion and senile ectropion.

Materials and Methods:
The patients with involutional eyelid entropion were treated with a combination of myectomy of the orbicularis oculi muscle, lateral lid-shortening with removal of a base-down triangle and excising a strip of skin of the lower eyelid. The patients with senile eyelid ectropion were treated with a combination of lower eyelid skin release, lateral lid-shortening with removal of a of a base-up triangle, and myocutaneous flap from the upper eyelid. Complications and recurrence rate were reviewed from the medical charts.

Results:
A total of 63 patients (75 eyelids) were included: 36 patients (45 eyelids) presented senile ectropion and 27 patients (30 eyes) presented involution entropion. The mean follow-up period was 12 months (range 3-40 months). Minor surgical revision was performed in two cases (2,7%) for early wound dehiscence. Hypo-correction was observed in one patient treated for entropion, but trichiasis was not observed, hence no further surgery was needed. One case (2,2%) of hypo-correction that needed surgical revision and two cases (4,5%) of residual scleral show were found in the group treated for ectropion. Recurrence of ectropion was found in 2 patients (4,5%) at three-year of follow-up.

Conclusions:
Based on our results, the 3-step combined procedure could be a viable surgical method to correct lower eyelid senile ectropion and involutional entropion. This combined technique is associated with a high success rate and few post-operative complications.

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SESSION 4

FACIAL PALSY, HEAD & NECK

EURAPS

Abstract No.: 130

Title : The role of the Mentalis Muscles on Lower Lip Symmetry in Post-Paretic Peri-Oral Synkinesis

Introduction:
Post paretic synkinesis is a condition characterized by pathologic co-contraction of antagonistic muscles typically developed after in-continuity facial nerve injury. A combination of nonsurgical and surgical treatment strategies is proposed, however the action of a synkinetic mentalis muscle in inhibiting the depression of the lower lip is not completely understood.
The aim of the study was to evaluate the role of the synkinetic mentalis muscle in influencing the position and symmetry of the lower lip and to assess the benefit of selective mentalis neurectomies for improvement of the smile.

Materials and Methods:
An IRB approved retrospective review cohort study was performed at our Institution comparing a group of patients treated with DAO and buccinator myectomy in addition to selective neurectomies without targeting the branches to mentalis muscle to a group of patients who underwent specific mentalis branches neurectomies during selective neurectomies in addition to DAO and buccinator myectomy.
Pre and post operative pictures were used to evaluate and compare the position of the lower hemi-lip (of the synkinetic side vs. healthy side), the inclination of the lower lip, teeth exposure and symmetry between sides in the two groups.

Results:
Sixteen patients were included in the Mentalis Neurectomy Group and 12 patients were included in the Non-mentalis Neurectomy Group. Statistical analysis showed significant pre- to post-operative improvements in dental show (p=.007), lower lip position of the affected side (both in the lower p=.023 and upper border p=.004) and inclination of the lower lip (p=.011) only in the Mentalis Neurectomy Group. Post-operative comparisons between the two groups showed superior improvements in the Mentalis Neurectomy Group across all measures.

Conclusions:
In synkinetic patients who underwent myectomies and selective neurectomies, the addition of targeted selective neurectomies to the branches innervating mentalis muscle improved the position and the symmetry of the lower lip, enhancing its depression, and increasing the dental show.

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Abstract No.: 141

Title : Management of post facial palsy synkinesis

Introduction:
Post facial palsy synkinesis has been reported to affect up to 45% of patients with Bell's palsy or other instances of palsy with partial recovery. It can be debilitating for the patient and can present as a challenge for the treating physician. There are different subcategories of synkinesis (eg oculi-oral / oro-ocular/ mentalis/platysma-frontalis) that could guide to the management options.

Materials and Methods:
We have looked at 150 consecutive cases with synkinetic patients who were seen in our facial palsy clinic over a period of six months (January-July 2023) and have been treated our care in the past. One hundred three were having facial therapy and Botulinum -A Toxin Treatments only. The remaining 47 had surgical management with an array of different techniques such as selective neurectomies, myectomies, cross face nerve grafts and muscle transfers. The minimum follow up period from the surgical techniques was 12 months.

Results:
All patients had standardised photographic and video documentation of the pre- and postoperative / post treatment status. The Sunnybrook facial grading scale was used at all hospital visits and EMOTRICS and AFFDEX were used for the surgical patients. The EMOTRICS showed decreased lower lip height deviation, increased modiolus resting position, closed mouth smile modiolus angle and excursion, open-mouth smile modiolus angle, excursion and dental show. The patients with neurectomies, cross facial nerve grafting, myectomies and muscles transfers were the most severe cases and had the best predicted outcomes with better control of the synkinesis and facial muscle tightness. However they still needed to be treated with facial therapy and much smaller dose of Botulinum -Type A Injections.

Conclusions:
There is a wide management array of synkinesis. We present our approach, treatment and outcomes of this challenging problem, along with how our practice has changed over the years based in new research and shared experiences with worldwide centres.

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Abstract No.: 41

Title : Successful integration of nerve to masseter transfer (NTM) along with cross facial nerve grafting for surgical upgrade in partial facial paralysis – changing the paradigm

Introduction:
Partial facial paralysis is difficult to manage, with no generally accepted surgical algorhythm. The combination of asymmetry of smile; deficient eye closure and synkinesis can coexist and require differing treatments. Surgical strategies to upgrade facial function include free tissue transfer; cross facial nerve grafting (CFNG) and nerve transfer. Non surgical strategies include Botox injections and physiotherapy. This study assesses the role of using NTM along with CFNG in these cases.

Materials and Methods:
The previous 10 year experience of treatment of both adult and paediatric patients with partial facial paralysis was assessed from retrospective case note review. 45 patients had surgery involving 1 or 2 CFNG, depending if eye closure was also targeted, along with a NTM transfer on the affected side. Assessments included photography; video and the Sunnybrook scoring system were used pre and post operatively. Limited facial nerve neurectomy was performed in selected cases. Other treatments given such as Botox injections and physiotherapy were noted.

Results:
Surgery gave an average improvement in facial movement of 38 points on the Sunnybrook scale, with an average improvement of 5 mm of excursion at the modiolus. Eye closure was improved in 6 cases with 5 achieving full eye closure. All patients described improved facial tone. No iatrogenic nerve damage was noted. Surgery does not generally improve synkinesis although early experience adding selective neurectomies to this procedure may lead to a diminished requirement for Botox in this select group.

Conclusions:
The algorhythm for treating partial facial paralysis includes physiotherapy; Botox injections and surgical intervention. Excellent results can be achieved by combining the NTM transfer and CFNG using an end to side neuroraphy, which does not prejudice any spontaneous recovery. This study supports integrating surgical upgrade of partial facial paralysis alongside conventional non surgical treatments.

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Abstract No.: 187

Title : Facial reanimation with masseter nerve-innervated free gracilis muscle transfer in established facial palsy patients: patient reported outcomes

Introduction:
Hereby we present a retrospective analysis of adult patients with established facial palsy who received Free-Muscle transfer Innervated by the Masseter Nerve.

Materials and Methods:
The smile excursion system was used to categorize patient smiles based on visibility of teeth. A cortical adaptation stage system was used to evaluate the functional progress of the transplanted muscle. A questionnaire was devised that included three concerns: facial smile in daily activity, facial smile in emotional situations, and patient satisfaction at 8- and 18-months post op.

Results:
Our data showed 36 patients the period September 2011-September 2022. Inclusion criteria were previous failed cross facial nerve graft (2-patients), strong controlateral smile (22-patients) and age 55 or above (12-patients). All patients had an uneventful procedure. Reinnervation of the gracilis muscle took 3.4 months. All patients with preoperative difficulties regarding oral competence reported a significant improvement with no spontaneous drooling and with adequate capability to control oral fluid. The average smile excursion score was 4.1 indicating that premolar or more teeth were visible. The cortical adaptation stage system demonstrated that 22 achieved stage III (independent smile), 14 achieved stage IV (spontaneous smile with presence of involuntary movement) and no patient presented with completely spontaneous smile. At 8 months average satisfaction in daily activities was 3.6/4, whilst in emotional situations was 3.4/4, indicating in both situations a symmetrical smile that needs minor improvement. At 18 months average satisfaction in daily activities was 3.1/4, whilst in emotional situations was even less 2.7/4, indicating an asymetrical but acceptable smile in both situations, and patient does not regret surgery.

Conclusions:
Masseter nerve innervation provides a strong independent smile in one-stage reconstruction, however patient satisfaction decreased over time, Presents with good symmetry at rest and during social smile, but patients raise concerns regarding spontaneity and symmetry during emotional smile.

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Abstract No.: 5

Title : Migraine Surgery: 12-year experience of a single Center

Introduction:
In recent years, surgical therapy has taken on an increasingly decisive role in the therapeutic armamentarium
of migraine. All surgical techniques are aimed at the complete neurolysis of some extra-cranial nerves, of which the most
involved (in our experience) are the greater and lesser occipital, auriculotemporal, supraorbital, and supratrochlear nerves.
This paper describes our surgical approaches for the treatment of occipital, temporal, and frontal trigger sites.

Materials and Methods:
A single-center, retrospective study was conducted on all patients who underwent surgical treatment of migraine between 2011
and 2022. Patients were asked to fill out a headache diary and complete a migraine questionnaire assessing parameters before surgery,
after 3 months, and 1 year after surgery. Data regarding age, sex, age at onset, migraines per month (in days), associated symptoms,
severity (on a scale from 1 to 10), inability to work per month (in days), health status, history of neck trauma, and family history were
collected. The Migraine Disability Assessment Scale (MIDAS) score was also used to evaluate the degree of disability for each patient.

Results:
We have operated on 612 patients (the largest casuistry in Europe): n.266 occipital, n.248 temporal, n.98 frontal. The surgical procedure elicited a
positive response in 90% of the patients (69% complete recovery). Complications were mild and temporary: mainly, hypoes▫thesia and numbness of the undermined areas, lasting from 3 weeks to 6 months. We observed the onset of secondary trigger
sites in 257 (42%) patients.

Conclusions:
The described procedure is minimally invasive and highly reproducible and allows to obtain a high degree of
success with a negligible rate of complications. Nevertheless, given the high percentage of occurrence of secondary trigger
points, it is particularly important to warn the patient of this possibility in pre-operative visits.

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Abstract No.: 185

Title : Maxillary bone density of cleft lip and palate patients with alveolar clefts: A comparative study with the normal population

Introduction:
The purpose of this study is to determine the trabecular bone density of the maxilla of cleft lip and palate(CLP) patients with alveolar cleft on both the cleft side and the non-cleft side, and to determine the difference between the two sides and in addition to the normal population of the same characteristics.

Materials and Methods:
This retrospective study included patients with cleft lip and palate who underwent alveolar cleft bone grafting in between 2017-2023. Based on same demographic properties a control group was determined. From the PACS system, in 1 mm thickness slices, almost 10 mm2 circular areas of both cleft and noncleft side of CLP patients and right-left side of normal population(control groups) trabecular maxillary bone density measurements were made in Hounsfield units(HU). Each meausurements were repeated by the same surgeon twice for increasing the accuracy.

Results:
Totally 200 patients(100 for each group) were enrolled in this study. Mean bone density on cleft and non-cleft sides of CLP patients were 686.43±252.85 HU and 398.54±189.17 HU, respectively and there was a statistically significant difference($p<0.001$). When comparing the CLP group with the control group, mean values in both groups were 542.48±265.39 and 438.61±192.40 HU, respectively. The mean value of maxillary bone density of CLP patients was higher than that of control group, and this was statistically significant($p<0.05$). Additionally, there was no correlation between maxillary bone density and age intervals in both groups.

Conclusions:
Individuals' bone density may show considerable variation depending on the abundance of factors, but for the first time in the known literature, CLP patients can be predicted to have higher mean values of maxillary trabecular bone density than that of the normal population. These findings may lead to guidelines that may influence future treatment protocols for cleft lip and palate patients with alveolar clefts.

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Abstract No.: 286

Title : Head and Neck reconstruction with Superficial Circumflex Iliac Artery Perforator (SCIP) Free Flap: Refinements and Innovations after 73 Cases

Introduction:
Head and neck tissue defects after ablative head & neck surgery often require complex and composite reconstructions. The superficial circumflex iliac artery perforator (SCIP) flap is an extremely versatile perforator-based flap with minimal donor site morbidity. We present our large experience with both simple and chimeric SCIP reconstructions for complex defects in various head and neck regions.

Materials and Methods:
73 patients undergoing ablative head & neck surgery for oncologic pathologies were treated by means of a SCIP flap reconstruction. Patients' mean age was 67 years old, 46 were males and one female. 55 flaps were simple and 18 were chimeric reconstructions pattern. Indocyanine green perfusion imaging was performed in all cases

Results:
70 of 73 (96%) patients were successfully treated with good aesthetic and functional result. 3 (4%) patients showed minor donor site complications which were managed conservatively. The mean follow up period was 6 months (range 3-9).

Conclusions:
Our case series demonstrates the reliability and versatility of the SCIP flap for head and neck reconstruction. The chimeric options combined with bone, double skin paddle and muscle offer a broad variety of functional reconstructive solutions for complex head & neck surgery. Intraoperative ICG perfusion examinations area valuable tool to assess and ascertain proper inset, vitality and post-anastomosis vessel patency in these complex microvascular flap reconstructions

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Abstract No.: 24

Title : Functional Outcome after Tongue Reconstruction: A Prospective Observational Multicenter Study in Japan

Introduction:
Tongue reconstruction is a complex procedure that requires careful evaluation of the postoperative outcomes. However, there is a lack of evidence-based data after tongue reconstruction. We aimed to fill this gap by conducting a statistically rigorous, prospective observational multicenter study with multivariate logistic regression analyses.

Materials and Methods:
This study was carried out by the Oral Pharyngeal Esophageal Operation and Reconstruction Analytical group, across 20 institutions in Japan. Patients who had oral tongue squamous cell carcinoma and underwent more than hemiglossectomy with tongue reconstruction between September 2017 and August 2020 were included. The outcome variables were feeding tube dependence, oral intake level, and speech function at the time of evaluation. The potential risk factors were identified by univariate analysis and then included in the multivariate analysis as binary variables. P-values of <.05 were considered statistically significant.

Results:
A total of 189 patients were enrolled, of whom 121 (64.0%) were eligible for the final analysis. The overall rate of feeding tube dependence was 12.4% (15 patients). The univariate analysis revealed that tongue defect type, laryngeal suspension, postoperative therapy, and tongue shape were associated with feeding tube dependence. The multivariate analysis showed that only extended tongue defect was a significant risk factor (odds ratio: 3.298). The oral intake level was influenced by age at surgery, laryngeal suspension, and postoperative therapy. The speech function was affected by age at surgery, ASA physical status (Class 2), medical comorbidities of hypertension and cardiac dysrhythmia, primary tumor stage (T4), neck dissection, reconstructive procedure, laryngeal suspension, reoperation, and postoperative therapy (radiation only).

Conclusions:
This study provides a useful tool for estimating the individual risk of feeding tube dependence, oral intake level, and speech function before tongue reconstruction. The results can help surgeons and patients make informed decisions and optimize the functional outcomes of tongue reconstruction.

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Abstract No.: 270

Title : Microvascular flaps from the ear in nasal reconstruction

Introduction:
Microvascular flaps from the ear, including helix, extended helix and TAPAS, can be used in the reconstruction of full-thickness defects of the nose. The aim of this study was to critically evaluate the appearance of the reconstructed nose.

Materials and Methods:
Patients operated between 2011 and 2021 were reviewed. Seven surgeons evaluated pre- and postoperative photographs. The observer-rated disfigurement scale was used. The shape and colour of the nose, as well as the appearance of the donor ear, were graded on a 5-point Likert scale. The FACE-Q questionnaire and a 5-point Likert scale on the appearance of the ear were used to assess patient satisfaction with the outcome. In all the Likert scales, a lower score indicated a better outcome.

Results:
A total of 31 reconstructions were identified in 29 patients, including two (6%) flap losses. The median age of the patients at the time of reconstruction was 61 years (range 21 to 79 years). Photographs were available in 26 (90%) patients. The shape and colour of the nose were rated as good (median score 2, range 1 to 3 for both scales). A moderately visible disfigurement with a degree of distortion was noted. The shape of the donor ear was assessed as good (median score 2, range 1 to 3). The questionnaire was sent to 24 (83%) patients as three patients had died and two needed an interpreter. Of these, 15 (63%) replied. The patients reported being satisfied with the appearance of the nose (median score 60, range 0-100) and nostrils (median score 64, range 0 to 100), and acceptable symmetry of the ears (median score 2, range 1 to 4).

Conclusions:
Microvascular flaps from the ear are a good option for nasal reconstruction. The aesthetic outcome achieved with the reconstruction is generally good with minor resulting deformity of the donor ear.

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Abstract No.: 159

Title : Virtual surgical planning in microsurgical head and neck reconstruction: the Newcastle experience

Introduction:
Microsurgical reconstruction of bony defects in the head and neck region is a complex procedure aiming to restore both form and function. While free-hand osteotomies and intra-operative plate bending has been the standard of care for decades, computer-aided design and computer-aided manufacturing (CAD-CAM) has gained popularity due to its accuracy, shorter operative time and reproducible results.

Materials and Methods:
A retrospective review of our prospectively maintained database was conducted, including patients who had undergone reconstruction of head and neck bony defects between 2017 and 2023. Both resection and reconstruction were planned in joint meetings with the KLS-Martin, who later provided cutting guides and custom-made 1.5 mm thickness plates. Demographic information, operative details along with oncological and reconstructive outcomes were recorded and analysed using descriptive statistics.

Results:
A total of 131 cases were identified, in which CAD-CAM technology was used in the planning and execution of bony reconstruction. The majority were male (61%) with an average age at diagnosis of 62 years of age. For 91% of the cases the reconstruction followed cancer resections, with the remaining being for osteoradionecrosis. For those ongoing oncological treatment, the resection was complete in 88% of the cases. Mandibular reconstructions accounted for 95% of the series, with maxillectomies the remaining 5%. Free fibula flaps were used for all cases, obtaining a free flap success rate of 94.8% and plate extrusion rate of 5%. Mean follow up for this cohort was 25 months.

Conclusions:
CAD-CAM technology has become a routine tool for head and neck reconstruction in our unit. Despite concerns that the time required for the manufacturing process could be associated with an oncological compromise, our series proves otherwise. A reproducible technique has led in our experience to a shorter learning curve for trainees, consistent results and a low metalwork extrusion rate.

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Abstract No.: 204

Title : Scapular osteomyogenous free flap in head and neck reconstruction – is it worth the effort?

Introduction:
The scapular osseous free flap (SOFF) has become an important reconstructive option for complex head and neck defects. Maxillary reconstructions are complicated, demanding a 3D reconstruction with chimeric flaps. This study aims to present preliminary results of the surgical outcome in a population-based cohort of consecutive patients with regard to postoperative complications and sequelae following maxillary as well as mandibular reconstruction with SOFF.

Materials and Methods:
This is a retrospective, observational, population-based study. All patients that underwent SOFF reconstruction at a tertiary referral center in Sweden from 2016 to April 2023 were invited to participate in the analysis and were followed for at least six months after surgery.

Results:
Forty-two of 44 consecutive patients accepted to participate and were evaluated (median follow-up 46 months, range 6-83). In the maxillary group (29/42) we experienced five flap losses (12%), three requiring an additional free flap reconstruction. Furthermore, six (21%) patients developed oronasal fistulas whereof four required revision surgery with a new flap. In patients with mandibular reconstructions (13/42) complications were rare. One patient (8%) developed a fistula and no flaps were lost.

Conclusions:
SOFF is a tempting option in complex maxillary reconstructions but is associated with a high rate of complications, which in this study might be partly explained by an initial learning curve. Methods that can prevent or minimize sequelae for future patients are warranted. SOFF is an excellent choice for mandibular reconstructions in selected patients.

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SESSION 5
BREAST RECONSTRUCTION

EURAPS

Abstract No.: 222

Title : The role of previous implant-based breast reconstruction and radiotherapy for surgical complications in deep inferior epigastric perforator breast reconstruction

Introduction:
A deep inferior epigastric perforator (DIEP) flap breast reconstruction can be performed de novo or after a previous implant-based breast reconstruction (IBR). Fibrotic changes and capsule development after IBR may increase challenges in microvascular surgery especially in patients with previous radiotherapy. We aimed to evaluate whether previous IBR is associated with increased surgical complication rates in DIEP breast reconstruction.

Materials and Methods:
This study included all patients undergoing DIEP flap breast reconstruction at a university hospital 2005-2022. Patients were divided into those with or without previous IBR, and then further into those with or without a history of radiotherapy. Main outcomes were 1) microvascular re-anastomosis during surgery and 2) total or partial flap necrosis within 30 days. Multivariable logistic regression analyses were adjusted for Body Mass Index, smoking status, and age.

Results:
Overall, 516 women had received 577 DIEP flap breast reconstructions. Partial necrosis occurred in 25 (4.3%) cases and total necrosis in 5 (0.9%) cases. Radiotherapy had been received prior to 446 reconstructions (77.3%) and in 213 (36.9%), an IBR had previously been performed. In irradiated patients, re-anastomosis and flap necrosis were significantly more common in those with a IBR (25/170 (14.7%) and 12/170 (7.1%), than those without a previous IBR (20/271 (7.4%) and 9/271 (3.3%); p=0.013 and 0.073, respectively). After adjustments, a previous IBR in the irradiated group, was independently associated with an increased risk of re-anastomosis (OR 1.98, CI 95% 1.04-3.76, p=0.037) but not flap necrosis (OR 2.17, CI 95% 0.84-5.62, p=0.110). In the non-irradiated group, no significant associations of previous IBR with surgical complications were found.

Conclusions:
Previous IBR increased the risk of perioperative re-anastomosis but not of flap necrosis among previously irradiated patients. Although re-reconstruction using a DIEP flap can thus be considered safe despite previous radiotherapy and IBR, surgeons should acknowledge an increased perioperative complexity.

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Abstract No.: 220

Title : Outcomes Following Immediate versus Delayed Breast Reconstruction After Mastectomy: An ACS-NSQIP Analysis Based on 21,560 Patients

Introduction:
Breast reconstruction can be performed in various ways and at different time points. The effect of the timing on outcomes remains debated. The aim of this study was to compare the postoperative complications in oncological patients undergoing implant or autologous in a single procedure with mastectomy or in two procedures.

Materials and Methods:
We retrospectively analyzed the ACS-NSQIP database (2008-2021) to identify all female patients who underwent reconstruction for oncological purposes. We stratified the outcomes, which included mortality, reoperation, readmission, surgical and medical complications, by procedure (implant versus autologous) and timing (immediate versus delayed).

Results:
A total of 21,560 patients were identified, 10,323 (48%) of which were autologous (8,378/81% immediate, 1,945/19% delayed) and 11,237 (52%) implant-based (9,791/87% immediate, 1,446/13% delayed). Complications were seen in 3,666 (17%) patients (Implant: 1,112/11% immediate, n=64/4.4% delayed; Autologous: n=2,073/25% immediate, n=417/21% delayed). Propensity score matching showed that immediate reconstruction, both for the implant and autologous cases, had more complications than delayed ($p<0.0001$), whereby implant-based showed the greatest difference.

Conclusions:
In this large registry study we found that immediate reconstruction is associated with more complications than the delayed option, both for the implant-based and autologous cohorts. These findings should not be misinterpreted as a blanket recommendation in favor of delayed reconstruction. Our findings should instead assist surgeons and patients in decision-making and help optimize patient selection and preparation case-by-case.

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Abstract No.: 320

Title : The impact of physical activity (GPAQ) on patient reported outcomes (BREAST-Q) following DIEP flap breast reconstruction

Introduction:
The DIEP flap the current gold standard for autologous breast reconstruction, and BREAST-Q data has allowed us to critically evaluate our outcomes. We aim to evaluate whether there is a correlation between physical activity levels and patient-reported outcomes in post-DIEP reconstruction patients.

Materials and Methods:
Retrospective data from a prospectively maintained database was collected for all patients undergoing DIEP flap reconstructions between July 2021 and June 2022. Breast-Q and Global Physical Activity Questionnaires (GPAQ) data was collected pre-operatively, and 1-year post-operatively.

Results:
A total of 136 flaps, of which 114 DIEPs, were performed. Breast-Q and GPAQ data was available from 51 patients, who were categorised into low pre-operative physical activity (low MET, n=27) and high activity (high MET, n=24). Low MET patients had lower pre-operative BREAST-Q scores for psychosocial well-being (by 9%), physical well-being (by 15% for chest and by 9% for abdomen) and baseline breast satisfaction (by 25%), the latter being significant ($p<0.05$). High MET patients had an 11% decrease in their activity levels post-op, whereas low MET patients showed a 23% increase. BREAST-Q scores post-operatively showed similar chest well-being and breast satisfaction. High MET patients had lower donor site satisfaction (by 12%), but better psychosocial wellbeing (by 16%). There were no discernible differences in post-operative complications.

Conclusions:
Patients with lower exercise levels pre-operatively tend to exhibit lower BREAST-Q scores for psychosocial well-being, physical well-being and baseline satisfaction with their breasts. Interestingly, this group experiences an uptick in physical activity levels following their procedure, suggesting that the breast reconstruction process can foster increased motivation for embracing positive lifestyle changes. Higher physical activity pre-operatively correlates with higher baseline scores, but a greater decrease in abdominal well-being post-operatively and decreased physical activity, This may underscore the challenges of resuming high levels of physical activity, potentially arising from disruptions in daily routines and donor site symptoms.

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Abstract No.: 325

Title : Machine Learning Improves Prediction Of Postoperative Morbidity In Autologous Breast Reconstruction Compared To Single-Factor Clinical Methods

Introduction:
While autologous breast reconstruction (ABR) is safe, higher postoperative morbidity is observed in selected frail patients. Single-factor models (age, ASA score, BMI, mFI-5) have shown inconsistent reliability in predicting surgical risk. Machine learning (ML) has shown high predictive power in several surgical applications, but its reliability in risk prediction for ABR has not been studied. Here, we hypothesized that ML algorithms can predict postoperative morbidity in ABR more accurately than single-factor models.

Materials and Methods:
The American College of Surgeons National Surgical Quality Improvement Program database was queried to identify ABR patients (01/01/2005-12/31/2020). Patients were split into free-flap and pedicled-flap cohorts. A composite outcome of 18 variables selected for statistical and clinical relevance was utilized to define 30-day postoperative morbidity. Three ML models (Random Forests, XGBoost, and L1-L2 recursive feature elimination) were compared to single-factor models (age, ASA score, BMI, mFI-5). Performance was measured using the area under the curve (AUC).

Results:
25,163 ABRs with 13,909 (55.3%) free-flaps and 11,254 (44.7%) pedicled-flaps were analyzed. A total of 8,330 (33.1%) patients experienced 30-day postoperative morbidity. Single-factor models predicted morbidity with an AUC≤0.55 in the free-flap and pedicled-flap cohorts,

except for BMI in the pedicled-flap cohort (AUC=0.6). ML models predicted morbidity with an AUC of 0.63-0.7. Morbidity was better predicted in the pedicled-flap group.

Conclusions:
Compared to single-factor models routinely used in clinical practice, the predictive ability of ML for postoperative morbidity in ABR is superior. However, the overall performance of all predictive models is generally poor.

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Abstract No.: 197

Title : Silicone Lymphadenopathy: A Single-Center Prevalence Study

Introduction:
Silicone lymphadenopathy (SLA) is a known finding after breast implant surgery. The clinical implications of SLA are not clear, although it has been linked to breast implant illness. To make a statement about the clinical importance of SLA more knowledge on the prevalence of SLA is necessary. Therefore, this study aims to provide a single center prevalence on SLA.

Materials and Methods:
This single-center retrospective cohort collected all reports of breast or axillary Ultrasound (US) and breast MRIs. These reports were screened for the mentioning of breast implant rupture and/or SLA.

Results:
1158 patients resulted in 900 MRI reports and 1345 US reports of which 810 patients with 706 MRI and 609 US reports had silicone breast implants (SBIs). Of these patients, 62 (5.4%) had SLA in combination with implant rupture (IR), 68 patients (5.9%) had SLA with an intact SBI, and in 167 patients (14.4%) there was solely IR. The indication for imaging in the breast implant population will follow, as will the number of patients with implants for reconstructive purposes.

Conclusions:
This retrospective cohort gives a single-center ten-year representation of patients with breast implants who underwent diagnostic imaging. However, the prevalence of SLA in this population might be an overestimation since not all women with breast implants undergo diagnostic imaging. Furthermore, this study did not research the possible effects or complaints of SLA.
Concluding SLA was visualized on imaging in 11.3% of the women in this study and is not always related to implant rupture. In the case of SLA, implant rupture is present more often (19.8%). To our knowledge, this is the first study to report on the prevalence of SLA. More studies should be executed to research the clinical impact of SLA.

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Abstract No.: 86

Title : Medium term QoL following breast reconstruction remains best in autologous group despite disparity in patient characteristics.

Introduction:
We have previously shown that short-term quality of life following autologous breast reconstruction is higher than after alloplastic reconstruction (Sadok et al. Plastic Reconstructive Surgery October 2023). The challenge in comparing autologous and alloplastic reconstruction patients lies in inherent differences in patient characteristics. The aim of this study was to investigate how quality of life following breast reconstruction develops over the first three years after the reconstruction, while elevating the comparison of reconstruction methods to a more sophisticated level, paying particular attention to the difference in patients groups involved.

Materials and Methods:
Patients underwent QoL assessments at multiple time points: preoperatively, at six weeks, six months, one year, and three years post-reconstruction. The study considered patient characteristics, complications, and (neo)adjuvant treatments. Utilizing a generalized mixed model on Breast Q scales, the analysis incorporated confounding factors, ensuring adjustments when changes in in correlation coefficients 5% without compromising the model fit.

Results:
The influencing factors contributing to the disparity in Breast Q scores between autologous and alloplastic reconstruction varied across Breast-Q subscales. Even after meticulous correction for all pertinent parameters affecting correlation coefficients, autologous patients consistently reported significantly higher satisfaction with their breasts ($p<0.001$, 95% C.I. 38.3; 59.7). Notably, this difference was not influenced by the duration of follow-up ($p=0.966$, 95% C.I. -2.8;2.7). While psychosocial and sexual well-being lost significance after adjustment for confounding factors, the significance of physical well-being of the chest persisted ($p=0.011$, 95% C.I. 2.4;17.8), and this significance was again not influenced by time ($p=0.168$, 95% C.I. -4.2; 0.7).

Conclusions:
This study underscores that even when considering disparities between the patient groups as confounders, satisfaction with the breast remains notably higher in autologous reconstruction patients over time.

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Abstract No.: 144

Title : TECHNICAL REFINEMENTS AND OUTCOMES ASSESSMENT IN PREPECTORAL POCKET CONVERSION AFTER POSTMASTECTOMY RADIOTHERAPY

Introduction:
Immediate implant-based breast reconstruction is currently the most common approach adopted by plastic surgeons worldwide. Nevertheless, the optimal placement plane of these implants is still debated. Several studies show how traditional submuscular breast reconstruction (SBR) is associated with animation deformity, chronic shoulder disfunction and increased postoperative chest pain, when compared to prepectoral breast reconstruction (PBR). This muscle sparing technique has recently gained great popularity due to its numerous advantages and satisfactory aesthetic results.
Prepectoral implant pocket conversion with pectoralis major repositioning seems to be a promising solution for all these side-effects with a high impact on patients' quality of life.
The aim of our study is to propose a refinement of the prepectoral implant pocket conversion technique applied to previously irradiated patients.

Materials and Methods:
We conducted a retrospective study on 42 patients who underwent previous nipple or skin-sparing mastectomy and immediate submuscular reconstruction, followed by radiotherapy. We performed fat grafting sessions as regenerative pretreatment. Six months after the last fat graft, we performed the conversion with prepectoral placement of micropolyurethane foam coated implants. We investigated the pre-conversion and post-conversion differences in upper limb Range of Motions, Upper Extremity Functional Index, Satisfaction with Breast and Physical Well-Being Chest.

Results:
We observed a resolution of animation deformity in 100% of cases. The Range of Motions and the Upper Extremity Functional Index scores were statistically improved after prepectoral implant pocket conversion ($P = 0.000$). Q-scores for Satisfaction with Breast and Physical Well-Being Chest were also increased ($P = 0.007$; $P = 0.005$). In all patients the pectoralis major repositioning was confirmed with an MRI at 12 months of follow-up.

Conclusions:
The proposed prepectoral implant pocket conversion is a reliable technique to solve animation deformity and improve different domains of patients' quality of life when previously treated with submuscular reconstruction and radiotherapy.

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Abstract No.: 246

Title : Breast reconstruction using latissimus dorsi and spinal alignment: what do we know so far?

Introduction:
The influence of mastectomy and Breast Reconstruction (BR) on spinal alignment is debated and the effect of BR using latissimus dorsi (LD) is unclear. Our aim is to assess postural changes in patients who received LD compared to other BR techniques and mastectomy alone. Endpoints were to calculate Cobb angle (CA) variations over time and identify risk factors.

Materials and Methods:
Patients who received mastectomy without reconstruction, two-stage Expander/ implant BR, Direct-To-Implant (DTI) BR and LD-based BR between 2006 and 2020, with minimum radiological follow-up of 2-to-5 years, were included. Postural changes were determined by an independent radiologist who assessed CA on chest radiographs at various timepoints, preoperatively and post-operatively, while blinded to type of received surgery. Statistical analysis was performed with Kruskal-Wallis H and Chi Square tests.

Results:
The study included 362 patients (489 breasts) among which 143 LD (204 breasts), 68 DTI (92 breasts), 58 two-stage (77 breasts) and 44 (48 breasts) mastectomy-only. Population mean age was 46.9 years (range 26-75), BMI was 23.9kg/m2 (range 19–31), and mastectomy weight was 399.1 g (range 80–1200). Mean follow-up was 6,25 years (range 2.18-14.82). Subgroup case-matching was performed for age, BMI, laterality, mastectomy weight and follow-up. Mean CA was respectively 4,6°, 5,1°, 3,7° and 6,1° preoperatively, and 5,9°, 6,5°, 4,1° and 7,6° post-operatively. Mean CA variation was 1,22°, 1,39°, 0,38° and 1,45°. No statistically significant CA variations were observed in any BR group. CA variations were influenced by age and mastectomy weight, but not timing, laterality, or technique.

Conclusions:
LD-based BR did not determine significant spinal changes at medium-term follow-up compared to DTI, or 2-stage ($p>0,05$). Age affected preoperative CA in mastectomy group ($p<0,05$). Post-operative CA is higher in mastectomy-only group but comparable in the other three. Our findings suggest that BR is not detrimental to posture, including LD-based techniques.

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Abstract No.: 257

Title : Patient-reported and surgical outcomes of Profunda Artery Perforator (PAP) Flap Breast Reconstructions compared to Deep Inferior Epigastric Perforator (DIEP) using BREAST-Q

Introduction:
Autologous reconstruction with a DIEP flap has become the gold standard. Alternative options include the profunda femoris artery perforator (PAP) flap, which has emerged preferable where abdominal fat cannot be harvested. In this study, we aim to critically compare post-operative clinical outcomes, aesthetic results, morbidity and patient satisfaction between DIEP and PAP patients, using clinical follow-up and PROMs with BREAST-Q.

Materials and Methods:
A non-blinded two-armed prospective cohort study was performed. All patients undergoing PAP or DIEP flap reconstructions between January 2021 and February 2022 were included and followed up for at least one year post-operatively. Demographic and per-operative data was acquired. Breast-Q data was collected pre-operatively, and at 2-week, 3-month and 1-year intervals post-operatively.

Results:
157 patients had autologous breast reconstruction with 207 flaps. Of these, 129 (82.1%) had 157 DIEP flaps and 21 (13.3%) had 39 PAP flaps. The rest had free flaps from other donor sites. Of the DIEP patients, 37 (28.6%) had a bilateral reconstruction, and of the PAP flaps, 1 case (5%) was bilateral. The rest of the PAP cases were stacked flaps for unilateral breast reconstruction. Mean ischaemia time for PAP was 55.29 (+/- 15.59 minutes) as opposed to 69.52 (+/- 21.74 minutes) for DIEP (p=0.014). PAP reconstructions were found to have a significantly higher rate of donor site wound dehiscence with 28.5% for PAP compared to 8.06% for DIEP (p=0.014). Between patients undergoing DIEP and PAP reconstructions, no significant differences were found in all BREAST-Q domains at 1 year follow-up.

Conclusions:
Long-term follow-up over 1 year shows no significant differences between patient-reported outcomes in DIEP and PAP flap reconstructions across all domains. These results reflect that PAP flaps, despite having a more challenging donor site and higher donor site complications, provide an excellent reconstructive option with similar patient-reported outcomes when compared to the gold-standard DIEP flap reconstruction.

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Abstract No.: 178

Title : A new approach for the breast sharing technique for breast reconstruction: the contralateral central IMAP flap

Introduction:
Autologous breast reconstruction remains a challenge for some patients. Using the contralateral breast to reconstruct the breast is conceptually an attractive alternative. Our objective is to present a new, more reliable design of the contralateral internal mammary perforator flap (cIMAPF) for patients undergoing breast sharing surgery based on central chest dominant internal mammary perforator flap.

Materials and Methods:
We reported a series of 46 consecutive patients who required breast reconstruction between 2011 and 2022. We performed an autologous reconstruction, sharing the contralateral breast tissue based on the dominant IMAP, using two alternatives' designs, the traditional one selecting the lower pole of the breast and a new design taking advantage of the central part, depending on the axiality and the caliber of the dominant vessel. All complications have appeared in cases based on the lower pole design.

Results:
The average age was 62 years, and the average body mass index (BMI) was 27. The dominant IMAP were found: 10 in the second intercostal space (ICS), 14 in the third, 5 in the fourth ICS, 12 in the fifth and 5 in the sixth. In 24 patients we harvested the central part of the breast and in 22 patients we used the lower pole. Two patients had partial flap necrosis (>20%) and two flap failed due to intraoperative technical errors. Three patients underwent additional venous anastomosis in the axilla to overload and increase venous drainage. Two flaps were converted to free flaps.

Conclusions:
The concept of breast sharing remains to be a reproducible and reliable option in patients who have considerable contralateral breast hypertrophy, especially with the use of the dominant IMAP vessels based on the new design, thus expanding the alternative indications for this technique.

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Abstract No.: 188

Title : Microsurgical Breast reconstruction and symmetrization in a single stage procedure using 3D printing

Introduction:
We conducted a prospective comparative study of women who underwent microsurgical breast reconstruction and symmetrization in a single stage, with or without using 3D printing technology.

Materials and Methods:
A commercial 3D scanner was used to create a 3D image of the patient's chest, and a simulation of mastopexy/reduction of the contralateral breast was generated where necessary. Subsequently, a 3D-printed model was created based on the mirror image, sterilized, and used as a sizer intra-operatively. In Group-A (n=50), the flap was placed inside the printed template to aid the surgeon in determining the shape and volume of the autologous flap, creating the desired breast dimensions. In contrast, in Group-B (n=50), flap shaping was performed with the conventional method, according to the surgeon's measurements and intraoperative estimation. Patients were 3D-photographed 6 months post-operatively, and the difference in shape and volume between the two breasts was estimated. Revision rate and patient satisfaction based on a modified Harvard Breast Cosmesis Scale, were recorded.

Results:
Our data showed a width difference of 0.6±0.2 cm and a mean volume difference of 111±10 ml in Group-A, while a width difference of 1.6±0.2 cm ($p<0.05$) and a mean volume difference of 221±14 ml ($p<0.05$) were observed in Group-B. Two patients in Group-A underwent major revision requiring general anesthesia, and 6 patients minor revision (under local anesthesia), while 16 patients underwent major revision and 8 minor revision in Group-B. Group-A scored significantly higher in the Harvard Breast Cosmesis Scale.

Conclusions:
3D imaging, simulation, and printing facilitate intraoperative decision-making of breast shaping and enable single-stage reconstruction and symmetrization.

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Abstract No.: 305

Title : Breast sensibility before autologous breast reconstruction – establishing the norms

Introduction:
Breast sensibility is an important outcome after autologous breast reconstruction. Knowledge about preoperative sensibility is important to adequately evaluate and inform patients. This study aims to provide a frame of reference for preoperative sensibility and to facilitate interpretation of postoperative outcomes.

Materials and Methods:
Patients who underwent autologous breast reconstruction between 2016 and 2022 and had preoperative sensibility assessment were retrospectively included. The breasts were categorized as healthy (never-operated), mastectomy, implant reconstruction, lumpectomy, reduction and augmentation mammoplasty. Tactile and thermal sensibility were analyzed.

Results:
This study comprised 287 patients contributing 572 breasts. In healthy breasts, tactile sensibility ranged 2.37-2.60 (Semmes-Weinstein Monofilament values), and 1.33-2.02 g/mm2 (Pressure Specified Sensory Device). Warmth and cold detection ranged 36.51-36.57 ˚C and 27.75-27.77 ˚C in healthy breasts. In all categories of operated breasts except augmentation, sensibility was significantly impaired. Protective sensation was significantly more often diminished or lost after mastectomy or implant reconstruction.

Conclusions:
Sensibility prior to autologous breast reconstruction differs depending on surgical history, and is impaired to a clinically relevant extent after mastectomy and implant reconstruction. Our results provide reference values for tactile and thermal sensibility, for the full spectrum of patients undergoing autologous breast reconstruction. This facilitates preoperative evaluation and education of the patients, and postoperative interpretation of the results.

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SESSION 6
RECONSTRUCTION & BODY CONTOURING

EURAPS

Abstract No.: 299

Title : Sternal Transplant Composite Allografts (STCA): a retrospective analysis

Introduction:
Sternal resection for oncologic or infective indication determines a major reconstructive challenge, to allow internal organs protection, respiratory function, and mobility of upper limbs. Since 1947 different techniques and materials have been used and reported, despite this at present there is no agreement on a "gold standard" method for sternal defects reconstruction.
The use of Sternal Transplant Composite Allografts (STCA) was first described in 2010: the technique consists of the replacement of a sternal defect with a non vascularized allograft, fixated with titanium bars and covered with soft tissue flaps. Recently it has been reported evidence on STCA behaving as a scaffold for bone regeneration. We present our experience about the use of STCA.

Materials and Methods:
16 STCA have been performed between 2012 and 2023 in our Center. Data were analyzed retrospectively. Indication for sternectomy, type of sternectomy, type of soft tissues reconstruction over the graft, short- and long-term complications and follow up were analyzed.

Results:
8 patients underwent oncological resection, and 8 patients underwent a resection for infection. 12 patients underwent sub-total sternectomy and 4 complete sternectomy, 9 patients underwent a pectorals major (PM) muscular advancement, 2 patients underwent PM muscular rotation, 2 patients underwent PM musculocutaneous rotation flap, and 3 patients underwent pedicled latissimus dorsi flap.
Post-operative complications included 4 seromas of the chest wall, 1 pneumothorax, 2 pleural effusion and 2 skin dehiscence treated with negative pressure therapy.
13 patients are alive with an average follow up time of 30.6 months; 12 of the patients present stable wounds; 1 patient presented a long-term fistula and partial graft infection 2 years post-operative. During the revision multiple bone biopsies were performed, showing ossification of the graft.

Conclusions:
STCA is simple, reproducible and provides stable and satisfactory functional results, as it presents optimal mechanical characteristics and biocompatibility, when adequately covered with vascularized soft tissues.

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Abstract No.: 288

Title : Reconstruction of Large Meningomyelocele Defects with Bilateral Perforator Propeller Flaps

Introduction:
Meningomyelocele, the most common form of spinal dysraphism, presents as a complex defect involving the spinal cord, vertebral spine, and the overlying skin. Various techniques for soft tissue closure in cases of larger myelomeningocele defects have been documented, such as skin grafting, random fasciocutaneous flaps, skin undermining with relaxing incisions, and musculocutaneous flaps. However, these approaches often fall short in adequately addressing defects larger than 8 cm, especially when associated with kyphotic spines. In this study, we share our clinical experience with a novel surgical procedure: bilateral propeller (BP) flaps utilizing dorsal intercostal and lumbar artery perforators for the closure of extensive thoracolumbar meningomyelocele defects.

Materials and Methods:
Between 2011 and 2022, our study included 15 newborns, comprising 10 males and 5 females, all presenting with thoracolumbar large meningomyelocele. Eight of these infants exhibited lumbar kyphosis. The myelomeningocele defects, with an average size of 75 cm (ranging from 50 to 140 cm), were effectively closed using bilateral propeller (BP) flaps.

Surgical Technique
Following neurosurgical intervention, dorsal intercostal and lumbar artery perforators were precisely identified through hand Doppler within the medial one-third of the dorsal region. Bilateral elliptical propeller flaps, based on LAP and DIAP, were meticulously planned with a 90-degree rotation arc, and all flaps were raised in a fasciocutaneous manner. The dissections of these flaps were conducted with careful attention under loupe magnification.

Results:
All flaps successfully survived without any instances of hematoma, seroma, wound dehiscence, flap necrosis, or infection observed. Remarkably, none of the patients necessitated any surgical revisions. These patients were monitored for a period ranging from 4 to 14 months, with an average follow-up duration of 12 months. Importantly, our series did not reveal any long-term complications, including necrosis of flap edges, wound breakdown, or instability.

Conclusions:
Bilateral perforator flaps can be used to cover kyphotic large thoracolumbar and lumbosacral myelomeningoceles.

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Abstract No.: 212

Title : Muscle-Rib Flap Transfer for Reconstruction of Composite Upper Limb Defects

Introduction:
Introduction Direct traumatic open fractures or their complications, as osteomyelitis and nonunion, represent the main etiology of bone defects. If soft tissue defects are also present, the management of these lesions becomes more challenging. The most used flaps in these cases are the vascularized fibula osteoseptocutaneous flap, the vascularized iliac osteocutaneous flap, and the vascularized muscular-rib flap. We previously reported about the advantages and the few complications by using the muscle-rib flap, and about the advantages of all-in-one reconstruction in complex injuries of the limbs involving both bone and soft tisuue defects by using these flaps.

Materials and Methods:
The study refers to 32 patients operated for acute or sequelar traumatic composite bone and soft tissue defects in upper limb, between March 1997 and March 2023, 8 females and 24 males, with an average age of 30,5 years (range, 5 to 66 years). The etiology of the defects was an acute trauma in 17 cases, and a posttraumatic complication in 15 cases. The average length of the bone defect was 5,2 cm (range, 3 to 8 cm), and the surface of soft tissue defect ranged between 6 and 475 cm2. The flap used was the SA-R in 14 cases, the LD-R in 11 cases, and the LD-SA-R in the remaining 7 cases; 23 were free flaps, and 9 pedicled flaps.

Results:
The average follow-up in our 32 patients was 23,1 months (range, 12 to 48 months). We had complete flap survival in all the cases. In only one case we registered a superficial wound infection, which was solved conservatively. Regarding the long term results, we registered a rate of primary bone union of 100%, with an average time of 6,6 months.

Conclusions:
The vascularized rib(s) as part of a composite flap represents a good indication in bone defects associated with large soft tissue defects.

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Do you have any disclosures?	No

Abstract No.: 229

Title : Revisiting the pedicled circumflex scapular artery (pCSA) perforator flap: From simple to complex locoregional reconstructions

Introduction:
Soft tissue defects involving the axilla and the upper back region are often complex to treat. The complexity of these defects may be extremely different, ranging from superficial skin damage to large loss of substance with lymphatic drainage impairment. The pedicled circumflex scapular artery (pCSA) perforator flap represents a valid procedure in this setting. It can be tailored according to the patient's needs, and its intraseptal pedicle allows a quick dissection with a wide range of motion.

Materials and Methods:
Twenty-four consecutive patients treated by means of pCSA perforator flap were included. All the flaps were pedicled and were used for locoregional reconstructions. The etiology of the defects was an oncologic resection in 15 cases, acne/hidradenitis suppurativa resection in 6 cases, lymphatic complication in 2 cases, and burn in 1 case. Patients' mean age was 61 years old; seventeen were males and seven were females.

Results:
All the patients were successfully treated with good aesthetic and functional results. One patient presented with a wound dehiscence, which required secondary surgical treatment. No partial or complete flap losses were encountered. Primary closure of the donor site was achieved in all cases. The mean follow-up period was 10.5 months (range 6–12).

Conclusions:
This case series shows the reliability and versatility of the pCSA perforator flap for locoregional reconstructions. Because of its rich vascularization, extensive or unconventionally- shaped flaps are possible. Moreover, its lymphatic rich tissues make it suitable for the treatment of complications related to axillary lymphadenectomy.

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Abstract No.: 304

Title : Autoaugmentation with lateral thoracic artery perforator-based spiral flap in postbariatric patients

Introduction:
With the increasing frequency of bariatric procedures, operations for breast contouring after massive weight loss are also increasing. Excessive weight loss after bariatric surgery leads to loss of breast volume. It is usually asymmetric and has a deflated appearance.Reduction, augmentation with implants and augmentation mastopexy techniques are commonly used for breast shaping in postbariatric patients. Regardless of the technique, the reduced breast does not provide good projection. Breasts with reduced elasticity are also poorly compatible with implants. In this study, we aimed to add additional volume to the breast tissue by utilizing the lateral dorsal folds of the patients and show the long term results.

Materials and Methods:
In this study, between December 2018 and July 2023, 17 patients presented to our clinic with the complaint of breast deformity due to excessive weight loss after postbariatric surgery. They were operated with the central pedicled mastopexy method augmented with a lateral thoracic artery perforator (LTAP)-based spiral flap.

Results:
Body mass index (BMI) of the patients ranged between 22.7 and 27.3. The mean jugulum to nipple distance was measured as 32.2 cm. Postoperative follow-up period was 1 month - 5 years. In the postoperative period, only detachment in the ‘T’ junction was observed in two patients.

Conclusions:
Central pedicled mastopexy with LTAP-based spiral flap provides a safe and long-lasting result to eliminate volume loss in breast tissue after postbariatric surgery. Skin folds on the lateral chest wall are also resected with the spiral flap method. In addition, brachioplasty and abdominoplasty can be added by extending the incision. It is a lower cost surgery compared to augmentation with prosthesis.

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Abstract No.: 70

Title : Balancing the Scales: Caution in Breast Reduction Recommendations for Obesity Class III Patients

Introduction:
The prevalence of obesity has continued to rise worldwide, posing a problem to surgeons as obesity is a well-known risk factor for surgical outcomes. While prior studies have suggested performing breast reduction (BR) in patients with obesity, the variance in outcomes and quality-of-life (QoL) for obesity classes are ill-defined. We investigated whether obesity classes should be considered for breast reduction by examining the surgical outcomes and QoL across different weight classes, aiming to pinpoint when outcomes become less favorable.

Materials and Methods:
Patients undergoing BR by two surgeons from 2016-2022 were included. BMI cohorts were formed according to CDC guidelines: obesity class I (30-34.9 kg/m2), II (35-39.9 kg/m2) and III (> 40 kg/m2). QoL was assessed by comparing pre- and postoperative BREAST-Q BR scores within cohorts. A comparison analysis was performed between weight classes.

Results:
461 BR patients were identified (I:142, II:39, III:19). As BMI increased, percentage of Black patients, procedure length, weight of tissue removed, and inferior pedicle technique all significantly increased ($p<0.001$). Obesity class III cohort had significantly higher rates of SSI (I:1.4%, II:0%, III:15.8%, $p<0.01$), fat necrosis (I:7%, II:0%, III:22.2%, $p=0.01$), dehiscence (I:2.1%, II:5.1%, III:31.6%, $p<0.01$), minor T-point breakdown (I:23.9%, II:23.1%, III:52.6%, $p=0.01$), and reoperations (I:6.3%, II:15.4%, III:21.1%, $p<0.05$). When comparing class III to class I or II independently, class III was associated with unfavorable outcomes ($p<0.05$). Significant improvement in average postoperative QoL scores was seen in all cohorts except class III in BREAST-Q modules on satisfaction with breast, as well as psychosocial, sexual, and physical well-being ($p<0.001$).

Conclusions:
Counseling patients in obesity class III demands utmost caution, thoroughly weighing the risks and benefits before recommending breast reduction surgery. We highlight the importance of providing comprehensive preoperative counseling, personalized care and shared decision-making for patients in different obesity classes.

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Abstract No.: 179

Title : US Trends and Outcomes For Immediate Replacement After Ruptured Implant Removal

Introduction:
Breast augmentation is one of the most common breast procedures, with over 3.5 million Americans having breast implants. The incidence of ruptured implants ranges from 1–35%, with risk increasing with time and comorbidities. Patients undergoing removal after rupture will choose to either have immediate, delayed, or no replacement. We aim to study trends and post-operative outcomes after immediate replacement.

Materials and Methods:
ACS-NSQIP database was queried for patients undergoing breast implant removal due to rupture (CPT 19330) from 2016–2021. Patients were categorized by immediate implant replacement status. Univariate analyses assessed differences in patient characteristics and outcomes, with subgroups for ICD10 codes specific for cosmetic encounters and breast cancer history.

Results:
Among 2,509 patients with ruptured breast implant removal, 483 (19.3%) received immediate replacement. Same-day replacements were more likely to be outpatient surgeries ($p < 0.001$) with shorter stay if admitted ($p < 0.001$). Non-replacements had slightly higher BMI ($p = 0.049$). Complication rates within 30 days was 3.4%, with no statistical difference. The cosmetic subgroup (94 patients) had 37.2% immediate replacements, of which 3 experienced complications; no postoperative events occurred in the non-replacement group ($p = 0.045$). The breast cancer subgroup (397 patients) had 15.9% immediate replacements, with no significant difference in complications ($p = 0.695$). However, operating time, total hospital stay, and age were lower with immediate replacement ($p < 0.001$, $p < 0.001$, $p = 0.031$).

Conclusions:
Receiving an immediate breast implant after removal of a ruptured one appears to be safe in the short-term and marginally better than opting out. While immediate replacement was associated with decreased length of stay, these patients may also inherently present less intricate rupture scenarios compared to their abstaining counterparts. Further research with more longitudinal data and clearer documentation of breast augmentation indications is needed to evaluate long-term outcomes.

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Abstract No.: 161

Title : Single Surgeon versus Co-Surgeons in Reduction Mammaplasty: a Comparative Study

Introduction:
As the demand for reduction mammoplasty steadily increases, so does the pressure to achieve optimal outcomes while reducing costs. The use of two operating surgeons has been shown to improve the efficiency and reduce the operative duration of many surgical procedures. We aimed to identify differences in operative times and short-term surgical outcomes of reduction mammoplasty performed by co-surgeons (CS) versus a single attending surgeon (SS).

Materials and Methods:
A retrospective analysis of breast reduction procedures in a single institution, including all consecutive patients who underwent primary reduction mammoplasty (RM) from 2005 until 2019, was conducted.
All operations were performed by one of our faculty attending surgeons as the primary surgeon. The assisting surgeons were either attendings or residents.
Our primary outcome measure was the difference in operative time between the two operative groups, while differences in complication rates were secondary outcome measures.

Results:
We identified a total of 951 patients, out of whom 245 (26%) underwent RM with a SS and 706 (74%) had a CS. Preoperative demographics and comorbidity rates were similar between the groups.
Surgical time was significantly shorter in the CS group (121.6 vs 142.3 minutes, $p<0.001$), while resection weight and intraoperative blood loss were similar.
Postoperative complications, readmissions, and reoperations were all similar between the CS and SS groups. Having a co-surgeon was associated with a significantly longer hospital stay (0.2 vs 0.6 days, $p<0.001$). Interestingly, re-operation at follow-up, more than 30 days from the primary surgery, was significantly higher when there was a co-surgeon (12.9% vs 3.0%, $p=0.014$).

Conclusions:
A surgical team comprised of more than a single attending surgeon in RM reduces surgical time, while hospital stay and long-term re-operation were higher, having similar postoperative outcomes.

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Abstract No.: 106

Title : Surgical Outcomes of Lower Body Lift in Patients with Massive Weight Loss: A retrospective review

Introduction:
The increasing prevalence of bariatric surgeries has led to a substantial rise in patients with massive weight loss (MWL) who require body contouring procedures. The Lower Body Lift (LBL) procedure involves the removal of excess skin and abdominal and gluteal fat, offering a viable solution to the aesthetic and functional challenges faced by this patient group. The primary objective of this study is to describe the complications associated with the LBL procedure in patients with MWL.

Materials and Methods:
This retrospective study encompasses patients who underwent to LBL surgery following MWL between 2021 and 2022. It was considered comorbidities, smoking status, weight, and both pre-operative and maximum body mass index (BMI). Additionally, duration of surgery, hospitalization, surgical protocol, pre-operative hemoglobin levels, and hemoglobin levels on the first day after surgery were evaluated. Early and late complications were evaluated such as seromas, wound dehiscence (with or without need for surgical intervention), hematomas, infection and proliferative scars.

Results:
The sample comprised 78 patients. The average pre-operative BMI was 25,3 kg/m2 and the average pre-operative hemoglobin value was 12,7g/L. Approximately 44,9% of the patients experienced some form of complication. The most common complications includade suture dehiscence without surgical need (33,3%) and seromas (11,5%). Complications were graded according to the Clavien Dindo Classification, witg 25,6% classified as grade I, 3,85% as grade II, 11,5% as grade IIIA and 7,7% as grade IIIB. Moreover, 11,5% of the patients required a blood transfusion post-surgery, indicating a higher risk of transfusion compared to MWL patients undergoing other body contouring surgeries (p = 0,022).

Conclusions:
LBL surgery offers distinct advantages over abdominoplasty, as it addresses gluteal and crural adiposity and ptosis. Importantly, it demonstrates an acceptable profile of complications, with few major adverse events, while delivering significant aesthetic and functional benefits for the MWL patients.

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SESSION 7
UPPER EXTREMITIES

EURAPS

Abstract No.: 309

Title : Routine Endoscopic Carpal Tunnel Release (ECTR) at the time of Wrist Fracture (WF) ORIF Prevents Complex Regional Pain Syndrome (CRPS)

Introduction:
Complex regional pain syndrome (CRPS) is a devastating consequence of wrist fractures with a well-accepted incidence of 3-7%. Untreated peripheral nerve compression such as carpal tunnel syndrome (CTS) exacerbates and prolongs CRPS symptoms. In an effort to minimize CRPS, our practice has routinely performed endoscopic carpal tunnel release on all our WF patients. In this study we evaluate the incidence of CRPS in a cohort of patients who underwent routine endoscopic carpal tunnel release (ECTR) at the time of WF fixation and compare it to historical rates.

Materials and Methods:
We performed a single-center retrospective chart review of all patients surgically treated for WF in our Center between 2020-2022. Less than 3months follow-up patients were excluded. Demographic characteristics, comorbidities, fracture characteristics, and, therapy notes were reviewed. Multivariable analyses were performed to identify factors associated with CRPS following surgery.

Results:
We identified 685 patients (178M; 507F) with WF that we treated prophylactically with ECTR at the time of ORIF despite having no obvious findings of acute CTS. Average age (61+/-19) days presentation from injury (4+/-4d), intra-vs-extra articular fracture pattern (76vs24%), postoperative immobilization period (16+/-7d). Of these patients, only 4 (0.6%) developed CRPS in their ipsilateral extremity within 3 months of sustaining the WF. Multivariate analysis failed to identify any predictive variables in those patients that developed CRPS.

Conclusions:
This retrospective review shows that the incidence of CRPS in this treatment group is 10 folds lower than that routinely reported for WF. Our clinical experience suggests that patients may benefit from prophylactic ECTR concurrent to wrist fracture treatment.

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Abstract No.: 143

Title : Subclavius Muscle Resection for Subclavian Vein Decompression in Paget-Schroetter and McCleery Syndrome

Introduction:
Paget-Schroetter syndrome (PSS) or McCleery syndrome (MCS) are venous compression syndromes, commonly treated with resection of the first rib, an invasive procedure with serious risk of complications. The purpose of this cross-sectional study was to evaluate the efficacy, safety, and long-term outcome of non-bony decompression by resection of the subclavius muscle and to provide a detailed description of the procedure.

Materials and Methods:
Patients who underwent non-bony decompression for PSS or MCS between July 2014 and September 2023 were analysed using clinical and radiological examinations. Patient-reported measures were employed to assess functional disability and residual symptoms (DASH) and disease-specific quality of life and symptoms (VEINES-QOL/SYM).

Results:
A total of 10 patients were included in the study. Seven were treated for PSS and 3 for MCS. At mean follow up of 45.4 (SD 31.0) months, all patients reported significant resolution of initial symptoms with patent vasculature on Doppler ultrasonography. All patients had a Villalta PTS score below 4, indicating the absence of post-thrombotic syndrome. The mean DASH score of 3.8 (SD 5.3) indicated minimal functional disability. Patients reported minimal overall impact on their quality of life as reflected by the mean VEINES-QOL score of 93.0 (SD 8.4) and low severity of venous symptoms as indicated by the mean VEINES-SYM score of 92.7 (SD 9.8).

Conclusions:
Our analysis suggests that non-bony decompression with resection of the subclavius muscle is a safe and effective intervention for definitive treatment of PSS with limited invasiveness and might pose an alternative to first rib resection.

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Abstract No.: 177

Title : Ultrasonographic (US) Evaluation of Morphological Changes in Peripheral Nerves after Traumatic Injury and Nerve repair– a Prospective Study

Introduction:
The aim of this prospective study is to determine a correlation of post-traumatic morphological nerve changes with US and nerve function after surgery.

Materials and Methods:
This dual center, descriptive, prospective cohort study included 20 mixed sensorymotor nerve lesions in 18 patients. Patients were followed up clinically, sonographically (US) and by electroneuromyography (EMG) as well clinically (sensibility, pain and motor function). The primary goal was to determine the morphological US changes of the nerves including the interaction of the surrounding tissue after nerve repair. The secondary goal was to determine any correlation between morphological US changes and nerve function. With US nerve cross-sectional area (CSA), number of traversing fascicles, potential hypo-echogenicity and presence of perineural scar were analyzed at 6 weeks, 3, 6, 9, and 12 months after surgery.

Results:
20 lesions (12 median and, 8 ulnar nerves) of 18 patients with intraoperatively confirmed nerve injury of at least 50% in the forearm were included. Follow-up of at least 9 months was possible in 70% (14 nerves) and 12 months in 60% (12 nerves) with a minimal follow-up of at least 6 months. The average CSA in mm2 was over 20mm2 throughout the follow-up period, corresponding to a neuroma in continuity compared to the opposite side where the average CSA in mm2 was 10.75mm2 after 6 weeks. Sensibility at 12 months was 1x S1, 5x S2, 5x S3 and 1x S4, motor function at 12 months was M3-5 in 10 of 12 patients. There was a statistically significant correlation between the number of continuous fascicles in US at 6 months and sensitivity at 12 months ($p=0.031$).

Conclusions:
Morphological changes in nerve structure (nerve diameter, continuity of fascicles) after trauma can be detected with US indicating a correlation between continuity of nerve fascicles and development of sensitivity and motor function.

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Abstract No.: 254

Title : Reconstruction of digital nerves with muscle-in-vein conduits

Introduction:
Muscle-in-vein conduits provide an alternative approach to autologous reconstruction of peripheral nerve defects. Low donor site morbidity, their abundancy all over the body and the absence of additional costs are favorable advantages of this method. Moreover, muscle-in-vein conduits may be a valuable method to treat neuropathic pain in cases of neuroma formation. The aim of this work is to provide evidence for sensory recovery and reduce of neuropathic pain after digital nerve reconstruction with muscle-in-vein conduits.

Materials and Methods:
37 patients with 43 gap lesions (0.9-6.0 cm) of proper palmar digital nerves treated with muscle-in-vein reconstruction between 2008 and 2017 were consecutively included in the study. Primary repair was performed in 22 cases, whereas 21 cases underwent secondary reconstruction. The median follow-up was 25 months. In 10 patients with a median period of reconstruction of 13.4 weeks after trauma suffering from neuropathic pain, the pain level according to NRS prior surgery and at least 12 months after reconstruction was assessed. Recovery of sensibility in all cases was assessed using static and moving 2-point discrimination and Semmes-Weinstein monofilament testing.

Results:
Evaluating all 43 nerve reconstructions, the median static and moving 2-point discrimination were 7.0 mm and 5.0 mm, respectively. The evaluation with Semmes-Weinstein monofilament revealed a median reduction of sensibility of 2 levels compared with the contralateral side. No relevant reduction of sensibility was noted at the donor site in all patients. Sensibility recovery was achieved in 90% of patients with secondary reconstruction suffering from neuropathic pain (preoperative NRS 4.7/10). Eight of ten patients reported complete relief of neuropathic pain. There was no recurrence of neuroma in any patient.

Conclusions:
Muscle-in-vein conduits can be reliably considered for primary and secondary reconstruction of digital nerves. Additionally, they provide an effective solution for the treatment of neuropathic pain after digital nerve injury.

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Abstract No.: 261

Title : Targeted muscle reinnervation into lumbrical muscles for treatment of symptomatic digital stump neuroma

Introduction:
The treatment of painful digital stump neuromas is challenging; the ideal approach to this complex problem remains controversial. Our objective is to present the surgical technique and preliminary results of treatment of painful digital end-neuromas with targeted muscle reinnervation into lumbrical muscles.

Case Report:
A 41-year-old worker suffered a traumatic index finger amputation at the PIP-joint, resulting in a persistent symptomatic stump neuroma on the ulnar side. The preoperative VAS with light touch was 8-9/10.
We performed neuroma excision and targeted muscle reinnervation into the second lumbrical muscle. The motor entry point is found approximately 18mm proximal to the A1 pulley (proximal end) of the middle finger. First, we began by dissecting the nerve to the lumbrical muscle, so that we would not exceed the 20-min tourniquet time for nerve stimulation. The ulnopalmar digital nerve of the index was dissected to the level of the dorsal nerve branch at the metacarpophalangeal joint. Intraneural neurolysis was then performed from distal to proximal over another centimeter to preserve the dorsal branch and reach the target. The recipient nerve was transected about 8mm proximal to the motor entry point. Tension-free coaptation without size discrepancy was possible.
The coaptation site was sealed with fibrin glue, and the nerve was blocked with an intraneural injection of ropivacaïn 1%. At one-month follow-up the patient perceives no pain or slight pain (VAS 1-2) with light touch on the ulnar stump side. Patient-reported outcomes show significant improvement in his quality of life, sleep and mental health.

Conclusions:
Targeted muscle reinnervation into expendable hand muscles appears to be a new therapeutic option with promising results. The anatomy is constant, as shown by several previous anatomical studies.

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Abstract No.: 154

Title : Multicentre study of the use of Local Anaesthetic formulas and volumes for WALANT in Plastic Surgery Hand Trauma Surgery

Introduction:
The COVID-19 pandemic posed substantial challenges to traditional hand trauma management in the United Kingdom, including disruptions to anaesthetic staff and operating theatre availability. This study aimed to evaluate the methods, effectiveness and outcomes of the Wide-Awake Local Anaesthesia No Tourniquet (WALANT) technique for hand surgeries.

Materials and Methods:
A prospective audit was conducted across multiple healthcare centres over one year, involving a diverse set of 110 cases performed by surgeons at different levels of training. Various anaesthetics were used due to supply limitations. Procedures were classified according to their complexity, and the volume of anaesthetics used was documented.

Results:
No complications were recorded across 110 WALANT procedures. The anaesthetics used varied, mostly due to product shortages, and were tailored to the complexity of the surgeries. The most common procedure was wound exploration, washout, debridement and closure.
Most procedures were performed using 1% lidocaine with 1:200,000 adrenaline, however other formulas were as safe and effective.
Average anaesthetic volumes needed were well below recommended maximum safe doses.

Conclusions:
The WALANT technique proved to be a versatile and safe modality for hand trauma surgery during the COVID-19 pandemic. While the study found variations in the types and volumes of anaesthetics used, no complications arose, suggesting that WALANT could be a resilient option amid healthcare disruptions. Further studies are required to standardize anaesthetic protocols.

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Abstract No.: 122

Title : Revascularisation of the hypoperfused digit under WALANT - A case series

Introduction:
We aim to present our case series of four patients who underwent revascularisation of one or more digits, in the setting of vascular compromise, under WALANT (Wide-Awake Local Anaesthesia No Tourniquet). We illustrate our experience with quantitative functional and patient-reported outcomes as well as accounts from the patient perspective. We aim to contribute to the understanding of the versatility and practical benefits of achieving a bloodless and anaesthetised field in the awake patient using local anaesthetic and low dose adrenaline.

Case Report:
METHODS
In the period March to June 2021 four patients underwent revascularisation under WALANT after traumatic disruption of digital blood supply. A standardised surgical technique of tumescent LA infiltration, fracture fixation, tendon repair, microsurgical anastomosis, neurosynthesis, “on-table” testing and post-operative observation were used. Primary outcome was digit survival. Hand therapists recorded TAM, return to work and other functional metrics as secondary outcomes. We also performed a tailored questionnaire to assess the patient perspective on all aspects of the operative experience and recovery.

RESULTS
Four males aged 18-49 (mean 29) years old underwent revascularisation of four fingers and one thumb. Two digits required vein grafts. Mean operative time was 4.5 hours with a mean volume of 20ml 1% lidocaine with adrenaline infiltrated per digit. All five revascularized digits survived without return to theatre. Intraoperative observation of re-established blood flow was not hampered by the presence of adrenaline. All patients working pre-operatively returned to work with a variable regain of digit function (10-12 week TAM 45-77%; Kapanji 10/10). Overall patients were comfortable during the operation with high satisfaction and value reported for operator-patient relationship, ability to observe and rapid postoperative recovery.

Conclusions:
Hypoperfusion has been a conventional limitation of the WALANT technique. However we can attest to its value, even in the scenario of digital devascularisation, with benefits to patient and surgeon alike.

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Abstract No.: 162

Title : HETERODIGITALLY-BASED DIGITO-METACARPAL FLAP: AN ALTERNATIVE SOLUTION TO COVER DEGLOVED FINGERS

Introduction:
The management of degloved digits remains a most challenging reconstructive problem in hand surgery. We describe a modified use of the reverse dorsal digito-metacarpal flap for reconstructing non-replantable degloving digital amputations. According to our modification, the digito-metacarpal flap is raised on the vascular axis of an adjacent intact finger, as a hetero-digitally based reverse axial flap.

Materials and Methods:
We used the heterodigitally-based dorsal digito-metacarpal (HBDDM) flap in eight patients (seven men, one woman) aged from 22-60 years, who suffered an Urbaniak Class III degloving injury of the ring (n=7) or little finger (n=1). In three patients, replantation was unsuccessful, while in five cases revascularization attempts were excluded. The flap's skin paddle measured from 16-23cm2 and was harvested from the third (n=7) or the fourth (n=1) intermetacarpal space. The pedicle's pivot point was located over the mid-first phalanx of the adjacent middle or ring finger. After elevation, the flap wrapped-around the degloved finger; associated skin-grafting for complete coverage was required in two cases. The flap's donor site was primarily sutured in all cases. Functional outcome was evaluated at 6 months post-operatively.

Results:
Follow-up ranged from 6-28 months. In all cases, the HBDDM flap provided successful coverage of the degloved finger; immediate post-operative venous congestion, that was recorded in three cases, subsided spontaneously and all flaps survived completely. Mobilization of the operated finger started by the second postoperative week. No residual stiffness of the metacarpophalangeal joint was observed; mean static two-point discrimination (2PD) was 11.2mm. Overall satisfaction scores were high, with minimal donor-site morbidity.

Conclusions:
Avulsion digital amputations resulting in degloving injuries with extensive soft tissue defects are still difficult to manage. The modified reverse dorsal digito-metacarpal island flap based on a hetero-digital vascular axis is a simple and useful technique for covering degloved fingers not amenable to replantation.

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Abstract No.: 181

Title : Outcomes of limited fasciectomy, needle fasciotomy and collagenase in Dupuytren's disease - a systematic review and meta-analysis of individual patient data

Introduction:
Outcomes of treatment of Dupuytren's disease with limited fasciectomy (LF), percutaneous needle fasciotomy (PNF) and collagenase clostridium histolyticum (CCH) have not been analysed in a systematic review and meta-analysis of individual patient data (IPD).

Materials and Methods:
We searched MEDLINE, Embase, the Cochrane Central Register of Controlled Trials and Web of Science for randomized trials and cohort studies published between January 1, 2000, and March 16, 2022, that studied treatment of Dupuytren's with LF, PNF or CCH. Studies were included if they reported on at least one of the following outcomes: postoperative total extension deficit (TED), complications, patient-reported outcome measures (PROMs) or time to recurrence, and IPD were available. Risk of bias was assessed by two independent assessors.

Results:
Of the 1423 studies identified, 15 were eligible for meta-analysis. IPD were available for nine studies (858 patients). Postoperative TED was smaller after LF than after PNF (β=0.97 95%CI 0.59;1.36, p<0.001) and CCH (β =0.52, 95%CI 0.93;0.10, p=0.015). Risk for mild complications was higher after CCH compared to LF (OR 12.4, 95%CI 6.8;22.5, p<0.001) and PNF (OR 21.4, 95%CI 12.4;37.2, p<0.001). Risk for serious complications did not differ significantly between treatments. Recurrence occurred 5.8 (95%CI 1.7; 20.0, p=0.002) times earlier after PNF compared to LF and 6.5 (95% CI 2.0;21.3, p=0.006) times earlier after CCH compared to LF, within a follow-up period of 36 months (IQR 24,36). The heterogeneity in type and follow-up of PRO measures used was too large to conduct meta-analysis.

Conclusions:
TED was slightly less after LF compared to PNF and CCH, but the difference is clinically not relevant. Mild complications occurred more often after CCH. The time to recurrence was longest after LF. The choice of treatment should be weighed against the chance of complications and time to recurrence and discussed with each patient.

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Abstract No.: 50

Title : Automatic motion analysis of the wrist using dynamic CT imaging for diagnosis of scapholunate ligament injuries

Introduction:
Four-dimensional Computed Tomography (4DCT) is an emerging imaging modality that allows non-invasive analysis of wrist motion and has potential to diagnose scapholunate interosseous ligament (SLIL) injuries. However, clinical implementation of 4DCT images is hindered by the multitude of generated data. Therefore, the aim of this study is to analyze wrist kinematics in healthy wrists and wrists with SLIL injury using a fully automated motion analysis algorithm.

Materials and Methods:
This study included 4DCT scans of 41 healthy wrists and eight wrists with arthroscopically-confirmed Geissler 4 SLIL injury. Two dynamic imaging sequences were acquired, wrist radial-ulnar deviation (RUD) and flexion-extension (FE), yielding 140-190 dynamic CT scans per wrist. Carpal bones were automatically segmented in each scan using an artificial-intelligence-based algorithm. Subsequently, the scapholunate distance (SLD) and sagittal scapholunate angle (SLA) were automatically computed in each wrist position. Data were linearly interpolated and median and maximum SLD and SLA values were calculated during both wrist movements. Both groups were compared using a Mann-Whitney U test ($p < 0.05$).

Results:
Both the average SLD and SLA were significantly larger in the injured group compared to the healthy group during RUD (respectively 2.49mm [1.36-3.40] vs 0.86mm [0.64-1.06], p = 0.00; 93.0⁰ [83.8-103.0] vs 69.2⁰ [62.3-74.1], p = 0.00) and FE (respectively 1.99mm [1.31-3.23] vs 0.92mm [0.71-1.17], p = 0.00; 92.3⁰ [66.6-102.3] vs 71.9⁰ [57.0-85.2], p = 0.00). The maximum SLD and SLA were also significantly higher in the injured group during both wrist movements.

Conclusions:
This study successfully developed a fully automatic analysis of wrist kinematics using 4DCT scans. Both SLD and SLA were found to be significantly larger in the injured group, indicating that 4DCT scans could be useful in diagnosing SLIL injuries. By quantifying wrist movement automatically, the proposed analysis can provide insight into the suspected wrist pathology.

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SESSION 8

PELVIC, PERINEAL & GENDER

EURAPS

Abstract No.: 29

Title : BREAST REASSIGNMENT IN TRANSGENDER PATIENTS

Introduction:
Breast surgery is among the most important parameters regarding gender reassignment in transgender patients, as breast size considered to be a significant symbol of gender. Safe surgical procedures of either breast feminization or masculinization followed by an aesthetically acceptable result have become attainable in modern plastic surgery of breast.

Materials and Methods:
The purpose of this study is to review our experience and evaluate the results on breast feminization and masculinization in transgender patients during the last decade. Two patient subgroups were examined. A total of 304 male-to-female transgender patients, who underwent breast augmentation, as well as 42 female-to-male transgender patients, where mastectomy was performed. Concerning breast feminization, silicone implants were used in all cases. For primary breast augmentation submuscular dual-plane method was performed in all cases. Supramuscular technique was adopted in secondary operations, only when the previous implant has already been inserted above pectoralis major muscle in the first operation and the new implant inserted was larger than 500cc. Regarding breast masculinization, double incision mastectomy accompanied by full thickness nipple graft was performed in the majority of cases (n=34). In patients with a native small breast size, peri-areolar subcutaneous nipple-sparing mastectomy was preferred (n=8).

Results:
The postoperative course was smooth and all patients were discharged within 24 hours. Complications following breast augmentation included wound dehiscence (n=2), local infection led to implant change (n=1) and immediate postoperative hematoma (n=1). Mastectomies were complicated with partial or total nipple necrosis in a total of 4 patients. All these complications were effectively treated with surgical approaches.

Conclusions:
Breast feminization or masculinization is almost always the first surgical procedure performed in transgender patients. Safe techniques combined with a very low postoperative complication rate have contributed to the increasing demand of these breast surgery options, as breast size and morphology play a crucial role in gender reassignment.

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Abstract No.: 43

Title : Comparative analysis of surgical techniques for bilateral subcutaneous mastectomy in female-to-male transgender individuals

Introduction:
Chest contouring or subcutaneous mastectomy (SCM) in female-to-male (FtM) transgender individuals is the primary surgery in the gender reassignment process. Many authors report high rates of postoperative bleeding in these patients and discuss a possible influence of preoperative hormone therapy. However, there is a lack of data on the analysis between different surgical techniques and postoperative bleeding risk.

Materials and Methods:
In this retrospective study, we included 22 FtM transgender individuals who underwent bilateral SCM using four different techniques (44 breasts) between June 2014 and September 2023. Postoperative complications were collected and analyzed with regard to surgical techniques and patient demographics

Results:
SCM with free nipple grafting was the most commonly used technique (n = 12, 54.5%). The mean operative time was 163.4 ± 49.2 minutes. There were no significant differences in operative time between the surgical techniques (p ≥ 0.20 in all cases). The rate of acute postoperative bleeding was 20.5% (n = 9). Acute postoperative bleeding occurred most frequently in patients who received a semicircular incision for SCM. There was no significant difference in the rate of acute postoperative bleeding between the different surgical techniques. BMI, breast weight and duration of surgery were not associated with the rate of acute complications (p > 0.17 in all cases).

Conclusions:
Less invasive SCM techniques in FtM transgender individuals are associated with higher postoperative bleeding risk.

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Abstract No.: 152

Title : Gender Affirming Phalloplasty by Radial-Forearm Free Flap: Comparison of the Chang and Hwang`s and Gottlieb and Levine`s Design

Introduction:
The radial forearm free flap is a widely used technique for phalloplasty among transgender patients, enabling a single-stage procedure. Despite the rising number of gender-affirming surgeries, there has been no direct comparison of the "tube-in-tube" designs proposed by Chang and Hwang (1984) or Gottlieb and Levine (1993).

Materials and Methods:
The retrospective analysis involved 45 female-to-male transgender patients who underwent phalloplasty using a radial forearm free flap between 2018 and 2020. The flap design was performed according to Chang and Hwang in 20 cases and Gottlieb and Levine in 25 cases. The study population was examined for group-specific disparities in epidemiological and procedural characteristics, as well as potential factors influencing the incidence of postoperative complications.

Results:
After a median follow-up of 22 months, no significant differences were observed between the two groups, except for partial flap necrosis, which were more prevalent in the Chang and Hwang group (50% vs. 8%, $p < 0.002$). The majority of perfusion problems were located in the distal neo-urethra (70%). There was no complete flap loss in either group. The incidence of urological complications (fistulas or stenoses) tended to be lower in the Chang and Hwang group (80% and 30%) compared to the Gottlieb and Levine group (92% and 52%). A significant influence of variables such as age, BMI, smoking, the number of venous anastomoses, or intraoperative ischemia time on the overall rate of complications could not be determined.

Conclusions:
The flap design according to Chang and Hwang demonstrates a lower incidence of urological complications but a significantly higher rate of partial flap necrosis, particularly in the distal end of the neo-urethra, compared to Gottlieb and Levine. Satisfactory optimization of the outcome can be achieved by appropriately adjusting the flap design depending on the chosen method.

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Abstract No.: 75

Title : Bone-anchored penile epithesis: a proof of concept clinical study

Introduction:
Following the introduction of the principle of osteointegration (Branemark, 1965), bone-anchored titanium implants have been used for oral implants, orthopaedic surgery, etc.
With this proof of concept research, we aim to develop a surgical technique for bone-anchoring penile epithesis. This could represent an alternative to conventional techniques for penis reconstruction in trans and cis men.

Materials and Methods:
Ethical approval was obtained.
Pre-operatively, patients' pubic bones are analysed by CT-scan. Surgical instruments have been designed. Surgical plan is composed of two stages. Stage-1: two titanium fixtures are implanted into the pubic bone.Stage-2: soft tissue of the pubic area is reduced, and abutments are inserted into the fixture. Once the skin around the abutments has healed, penile epithesis is connected to the skin-penetrating, bone-anchored implants.
During the period 2013-2014, a total of ten trans men underwent stage-1 surgery; nine of them underwent stage-2 surgery. All patients refused metaidoioplasty or phalloplasty. Three different penile epithesis prototypes were developed.

Results:
One patient presented a lack of osseointegration to one of the two titanium fixtures, which were subsequently removed. 19/20 implanted fixtures resulted osteointegrated at CT scans.
One patient decided to proceed with different type of penis reconstruction.
Three patients decided to remove the abutments, due to skin issues around them.
One patient is still under treatment for skin growing over the abutments.
Three patients tried and mount 2 different epithesis prototypes, which were built with mini Jack plastic connectors, which could break and stuck into the abutments. Two of these three patients abandoned the project. One patient is trying a third prototype, which is built-in with magnetic connectors, and is satisfied.

Conclusions:
We proved the concept that osteointegration is feasible onto the pubic bone; we have developed surgical instruments, surgical technique, and prototypes for a bone anchored penile epithesis. Further research is indicated.

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Abstract No.: 158

Title : Ablative Surgical Treatment of Peno-Scrotal Elephantiasis

Introduction:
Peno-scrotal elephantiasis is a rare medical condition caused by the obstruction of the lymphatic drainage and characterized by volumetric enlargement of the genitals that leads to compromised urinary flow, sexual discomfort, difficulties in ambulation and improper perineal hygiene with recurrent episodes of infection. Although initial stages may be amenable to conservative medical or minimally-invasive microsurgical treatment, extreme cases require drastic ablative and reconstructive surgery. Nevertheless, there is no standard treatment and each case deserves a meticulous surgical planning tailored on patient's condition.

Case Report:
We present three cases of extreme peno-scrotal elephantiasis clinically characterized by lipedema, tight phimosis, volumetric increase of the scrotum and verrucous changes of the skin. In all cases, the excessive fibro-adipose tissue of the penile shaft and scrotum was resected, carefully preserving the penis and the testicles. After demolitive surgery, penile coverage was achieved using the residual skin in one case, and split-thickness skin grafts in the other cases. For scrotal reconstruction, in one case we used local advancement flaps from the pubic area with penile transposition, while in the other two cases we employed the residual scrotal skin flaps. In all three cases elephantiasis was successfully corrected in a one-stage procedure, with good cosmetic and functional results, a persistent resolution of phimosis, a reduction in scrotal volume and penile lipedema, an improved intimate hygiene, and a restored urinary function. Patients who underwent penile shaft resurfacing with skin grafts reported better sensory function recovery. In two cases, we observed a minor surgical dehiscence in the lower scrotal portion that was conservatively treated with bedside dressings.

Conclusions:
Despite the advent of supermicrosurgery for lymphedema treatment, ablative surgical approaches are still considered the primary choice in the management of extreme cases of peno-scrotal elephantiasis, allowing a long-lasting resolution of the condition and a significative improvement in quality of life.

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Abstract No.: 251

Title : Sequential treatment by lymphovenous shunt followed by free gastro-epiploic vascularised lymphnode transfert for penoscrotal lymphedema: a case report

Introduction:
Genital lymphoedema (GL) is a chronic and debilitating disease, which can severely affect patients quality of life. Nowadays, no specific and definitive treatment exists for GL. We report for the first time the use of gastro-epiploic vascularised lymphnode transfert as supplementary procedure after lymphovenous bypass in a recurrent case of primary penoscrotal lymphedema.

Case Report:
A 54 years old male presented with a primary penoscrotal lymphedema, resistant to all conservative treatment such as selective compression and physical therapy.
The patient presented total shaft distortion associated to scrotal oedema, cutaneous papillomatosis and active lymphorrea.
A first approach using a lymphovenous bypass consisted in multi lymphatic into vein (MLVA) anastomosis, shunting 3 lymphatic vessels into the pudenda externa vein. Such procedure allowed for immediate cease of the active lymphorrea and drastic scrotal volume reduction, with clinical and lymphoscintigraphic improvement. However, such procedure did not significantly improve the penile shaft oedema and distortion. 4 years postoperatively the patient presented a partial scrotal oedema recurrence with two episodes of infections and worsening of the penile oedema. A laparoscopic harvest of gastroepiploic lymphnode trasfert was performed and the omental node flap was transferred at the pubic base. The flap was revascularised rerouting the left deep inferior epigastric vessels, with E-E anastomoses on the right gastroepiploic pedicle. No postoperative complications occurred. At 12 months the patient presented a progressive clinical amelioration, without any infective episodes. At 3 years follow-up the oedema was totally resorbed except two limited fibrotic zones, which were excised in day-surgery, with a stable excellent functional and aesthetic result.

Conclusions:
Gastro-epiploic vascularised lymphnode transfert showed to be extremely effective in treating genital lymphedema. This procedure may add to the surgical armamentarium to treat such extremely complex ad severely debilitating disease.

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Abstract No.: 53

Title : Management of Mons Pubis in the Massive Weight Loss Patient

Introduction:
The high incidence of female obesity and weight loss has resulted in common complaints of a large, protuberant mons pubis related to unsightly fat deposits and skin ptosis. The authors show their technique to correct the protuberant mons and pubic descent by performing a pubic lift, fat excision, and liposuction, and then tacking the superficial fibrofatty tissue to the rectus fascia. These techniques eliminate difficulties with sexual intercourse, poor hygiene, and discomfort, while also improving self-esteem.

Materials and Methods:
We identified 60 consecutive female MWL patients who had undergone mons pubis contouring and completed at least 6 months of follow-up. Subjects were asked to complete a post-operative psychological evaluation pertaining to body satisfaction and other bodily changes.. Demographic and procedural data were collected. Descriptive statistics were calculated with significance set at P value <.05.

Results:
54 patients completed the survey. Visualization of the genitalia improved from 70% to 100%. Patients showed a significant improvement of the appearance of their mons pubis. Hygiene improved in all of patients, and sex life improved in 85%, with 80% of patients reporting increased genital sensitivity. Patients confirmed a decrease of incontinence (90%). 9 patients developed a temporary edema in the mons pubis and 3 patients developed wound healing problems.

Conclusions:
Pubic contouring after massive weight loss is very successful and safe if performed meticulously. It can be performed safely during abdominal contouring with high patient satisfaction to improve both form and function of the pubic region.

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Abstract No.: 83

Title : Longitudinal Outcomes of Abdominoperineal Resection Reconstruction: A Single-Center, Retrospective Review

Introduction:
Reconstruction after abdominoperineal resection (APR) typically utilizes primary closure, locoregional myocutaneous flaps (gracilis or vertical rectus myocutaneous (VRAM)), omental flaps, or rarely, free tissue transfer. While flap coverage is considered superior to primary closure, no specific flap is preferred, and reconstructive complications can occur in 20-50% patients. The purpose of this study is to compare outcomes of perineal reconstruction with VRAM, gracilis, and omental flaps at our institution.

Materials and Methods:
A single-center retrospective cohort review was performed on all adult patients who underwent APR defect reconstruction with VRAM, gracilis, or omental flaps between 2014-2023. Demographic, operative, and outcomes-associated variables were noted (surgical site infection, non-healing wounds, flap necrosis/failure, need for additional procedures/surgeries, etc.

Results:
A total of 80 patients were identified, 11 diagnosed with inflammatory bowel disease (IBD), and 58 diagnosed with colorectal cancer, and 11 with other urogenital/gynecologic malignancies or benign fistulizing disease. Flap reconstruction was as follows: 49 gracilis, 24 VRAM, and 7 omental. Mean follow-up was 34.9 months [1.56 weeks, 9.12 years]. Enterocutaneous fistula (ECF) formation was significantly more likely in VRAM vs. gracilis flaps (gracilis OR: 0.11, p = .02), when adjusted for neoadjuvant chemoradiation. Overall complication rate was 72.5% of patients, of whom 45% required procedural intervention.

Conclusions:
Perineal reconstruction after APR can be achieved by various methods. While literature has shown flap closure to be more efficacious, differences in overall post-operative complication rate across flap type are minimal. Consideration of alternatives to VRAM reconstruction is warranted in patients predisposed to fistula formation.

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SESSION 9
AESTHETICS

EURAPS

Abstract No.: 46

Title : Efficacy of Renuvion Helium Plasma to Improve the Appearance of Loose Skin in patients candidate to abdominoplasty after massive weight loss: controlled randomized study.

Introduction:
Renuvion was first helium plasma device utilized for subdermal tissue heating to reduce skin laxity under an FDA general clearance for cutting, coagulation, and ablation of soft tissue. The purpose of this study was to demonstrate that the use of Renuvion improve the outcome, the skin quality and reduce the edema faster.

Materials and Methods:
Patients meeting the following criteria were included in the study: primary surgical procedure, skin laxity in abdomen region, minimum 2-years follow-up, proficiency in Italian language, signed consent, standardized pre and postoperative photographic documentation. The study was performed with a double-blinded randomized design: both the patients and two of the authors measuring outcomes were blinded to the treatment methods. All patients were asked to answer the BODY-Q satisfaction for skin quality and abdomen appearance. Two plastic surgeons reviewed all postoperative photographs, rating the outcome on a 1-5 VAS scale.

Results:
76 patients were enrolled, 33 males and 43 females, aged between 20 and 50 years. Patients were randomly divided in 2 groups: group 1, lipoabdominoplasty alone; group 2, lipoabdominoplasty using Renuvion also. All procedures were performed by the same time. Both the BODY-Q and VAS scores were higher in groups 2. Edema resolved earlier in group 2.

Conclusions:
The data demonstrate benefit to patients by improvement of the appearance of lax skin in the abdominal region using renuvion. This is the first randomized study about this topic and the use of Renuvion and could be consider a pilot study.

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Abstract No.: 79

Title : Intraoperative Measurement-Based Approach to Supratip Deformity in Open Structural Rhinoplasty

Introduction:
Supratip deformity is one of the most common complications after open rhinoplasty. This study aimed to define a new risk scoring system for supratip deformity and determine the distances that should be left between the tip defining point (TDP) and anterior septal angle (ASA) to prevent it.

Materials and Methods:
469 patients who underwent open rhinoplasty between 2018-2022 were included in this retrospective study. The patients were evaluated according to the risk scoring system consisting of four parameters (skin thickness, lower lateral cartilage anatomy, amount of hump resection, and soft tissue procedures). Due to the presence of supratip deformity at the postoperative 12th month, the patients were divided into two groups: (i) without supratip deformity (n=418) and (ii) with supratip deformity (n=51). Statistical inferences were made regarding the development of supratip deformity by evaluating the relationship between the risk scores and the intraoperative TDP-ASA distances.

Results:
There was a significant difference between the groups in risk scores ($p<0.05$). In cases with high-risk scores, it was calculated that the probability of developing supratip deformity decreased significantly when the TDP-ASA distance was above 7.5 mm and increased significantly when the TDP-ASA distance was below 6.5 mm. In cases with low-risk scores, it was found that the probability of developing supratip deformity was reduced considerably when the TDP-ASA distance was over 6.0 mm.

Conclusions:
The authors recommend keeping the TDP-ASA distance above 6.0 mm in low-risk patients and 7.5 mm in high-risk patients to avoid supratip deformity

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Abstract No.: 15

Title : The use of inter-alar ligaments flap for tip and supra-tip contouring in primary open structural rhinoplasty.

Introduction:
Precise tip contouring is paramount to achieve pleasant cosmetic results in rhinoplasty. Loss of tip projection or rotation, supra-tip deformities, as well as long-lasting edema, may jeopardize the outcome, thus leading to patient's dissatisfaction or re-intervention. Several approaches were previously reported, sometimes with considerable drawbacks or conclusions mainly supported by experience. The aim of this study is to describe the inter-alar ligaments flap for tip and supra-tip contouring and to comparatively assess its efficacy and safety.

Materials and Methods:
The study included 147 patients who underwent primary structured open rhinoplasty and divided into 2 groups: group 1 underwent harvesting and repositioning of the inter-alar ligaments flap, group 2 underwent conventional tip dissection. Tip edema, supra-tip definition and fullness were blindly scored at 2-, 6- and 12-month post-operative follow-up. Naso-labial angle was measured at 2 and 12 months post-operatively. Univariate analysis and and multivariable regression model were performed.

Results:
Supra-tip definition was significantly higher in group 1 at 2-, 6- and 12-months post-operative follow up ($p<0.05$, $p<0.01$ and $p<0.01$, respectively). Tip edema and supratip fullness were significantly lower in group 1 at each time point ($p<0.01$). Naso-labial angle, as well as its modification between 2- and 12-months post-intervention, did not differ in the 2 groups. All findings were confirmed when controlled for eventual confounders.

Conclusions:
The inter-alar ligaments flap proved to be versatile, effective and consistently reliable in reducing tip edema and improving supra-tip definition. It may be tailored to the patient, partially folded to improve tip projection or used to camouflage tip grafts.

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Abstract No.: 149

Title : Supraorbital Bone Shaving (S.O.S Procedure) in Restoration of Upper Lateral Convexity in Sunken Eyes

Introduction:
Sunken eyes have become a most important target of periorbital area aesthetics. Throughout history, the aesthetics of the periorbital region have been emphasized, and various surgical techniques related to this region have been described. Most of these techniques provide only soft tissue solutions; therefore, additional surgical interventions may be required. The aim of our study was to introduce an endoscopic supraorbital shaving (SOS) technique for the treatment of individuals with sunken eyes.

Materials and Methods:
Between 2020 and 2021, 34 patients (30 females, 4 males; mean age 36.2 years) with sunken eyes were treated with our described technique. All patients underwent an endoscopic SOS procedure under general anesthesia. A single 2.5 cm incision was made behind the hairline proceeding with the subfascial and subperiosteal planes and exposing the supra orbital bone under endoscopic guidance. A piezo device was used for bone shaping. The contour of the orbital rim was gradually checked from outside while the flap was retracted to the desired vector to the temple zone.

Results:
A total of 34 patients (30 women and four men), aged 23–59 years old (mean = 36.2 years), underwent the endoscopic SOS procedure. The mean follow-up period was 13 months (range: 12–16 months). Postoperatively, significant improvement in lateral convexity was achieved in all patients. Physical examinations performed at the control visits revealed no functional problems in any patients and no visible or palpable irregularities or contour deformities. No complications were encountered regarding the SOS procedure.

Conclusions:
The technique described here provides significant improvement in lateral convexity compared to other techniques used in patients with sunken eyes. No additional eyelid intervention is needed. Unlike the techniques previously described in the literature, intervention is made in the bone structure, thereby providing more accurate results.

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Abstract No.: 120

Title : Botulinum Toxin: a non-surgical approach for non-myasthenic mild to moderate blepharoptosis treatment

Introduction:
Mild to moderate blepharoptosis can be aesthetically displeasing for patients, particularly in cases involving a single eyelid. However, certain patients are reluctant to undergo surgical intervention. Botulinum neurotoxin A (BoNT-A) injection offers a potential solution in such cases.

Materials and Methods:
Patients meeting the following inclusion criteria were included in the study: mild to moderate eyelid ptosis of different etiology (excluding myasthenic disorders), robust activity of the eye orbicularis muscle, proficiency in Italian language, standardized pre- and postoperative photo-documentation, signed consent for study participation. 24 patients were enrolled, 21 females and 3 males, aged between 41 and 76 years old. A 33-gauge 4mm needle was employed to inject low-dose (1.5 to 3 units) BoNT-A in the pretarsal orbicularis region. Standardized videos and photos were obtained 1-, 4- and 20-weeks post-treatment. Outcomes were evaluated by measuring changes in the margin reflex distance-1 (MRD-1) before and after treatment, in addition to a patient-reported qualitative questionnaire administered at the four-week mark.

Results:
We observed a significant increase in the MRD-1 compared to the baseline (p=0.004). The patients ceased to require furrowing of the frontalis muscle to compensate for the eyelid elevation dysfunction. After 20 weeks, the BoNT-A effect diminished, and the treated eyelid had returned to its baseline position. 90% of patients reported an improvement in their blepharoptosis and expressed the desire to undergo the treatment again.

Conclusions:
BoNT-A has demonstrated effectiveness in temporarily managing mild to moderate blepharoptosis and may represent a viable option for addressing minor eyelids asymmetries.

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Abstract No.: 283

Title : RISK FACTORS ASSOCIATED WITH BIA-ALCL DEVELOPMENT: A CASE CONTROL STUDY

Introduction:
So far etiology and risk factors associated to BIA-ALCL are only hypothesized. We aimed to identify variables that are connected with BIA-ALCL and increase the risk of its development.

Materials and Methods:
An age-adjusted (±5 years) case-control (1:4) study (level II evidence) of 89 diagnosed BIA-ALCL cases (39±13 years) and 310 breast implant control patients (46±10 years), was conducted. Eighty clinical (personal and family, medical and surgical history), demographic (age, BMI) and life-style variables (tabagism) were analyzed by a conditional logistic regression to estimate their odds and identify their impact in BIA-ALCL incidence.

Results:
All patients had an history of at least one exposition to implants with a roughness higher than 10µm. No association was observed between BI manufacturer (p=0.21). Replacement was associated with 43% lower odds (0.57, 95%CI 0.37-0.86). BI volume was positively associated with BIA-ALCL (per 100cc 1.65, 1.22-2.21). Compared to cosmetic augmentation, BIA-ALCL was less likely to occur in post-oncologic patients (0.01, 0.001-0.03). History of chemotherapy, radiotherapy, and hormone therapy showed respectively 88% (0.12, 0.06-0.23), 69% (0.31, 0.15-0.64) and 91% (0.09, 0.05-0.18) lower odds. Women who had stopped smoking were 39% less likely to have BIA-ALCL compared to smokers (0.61, 0.38-0.87). Autoimmune co-morbidities were associated with 2-times higher odds (2.01, 95%CI 0.76-5.35) and Hashimoto's Thyroiditis with 2,5-times higher odds (2.57, 95%CI 0.69-9.17).

Conclusions:
We confirm no BIA-ALC cases with history of implants with roughness only lower than 10µm. We could first demonstrate that BIA-ALCL more likely occurs in patients with higher implants volume, autoimmune co-morbidities, or cosmetic indication. While it occurs less likely with post-oncologic patients, chemotherapy, radiotherapy, hormone therapy, smoking abstention and in patients with a history of one or more implant replacements.

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Abstract No.: 284

Title : Breast Implants and the Risk of Squamous Cell Carcinoma of the Breast – Systematic Review and Epidemiologic Study

Introduction:
Squamous cell carcinoma may arise as a malignancy from the periprosthetic capsule of breast implants (breast implant-associated SCC or BIA-SCC), or from the breast parenchyma (primary SCC of the breast or PSCCB). We aimed at to identify all reported BIA-SCC cases by a systematic review, and provide a risk estimate for the United States (US) population in comparison to PSCCB and BIA-ALCL.

Materials and Methods:
From September 2022 to June 2023, all publications on BIA-SCC were searched on Pubmed, Web of Science, Google Scholar and Cochrane Library to assess the numerator. US breast implant and texture-specific breast implant populations, estimated with chest x-ray method and including also female transgenders, were used as the denominator respectively for BIA-SCC and BIA-ALCL, while general US female population was used as denominator for PSCCB. Risk was calculated as the ratio between total number of cases and active population at risk without the reported cases, expressed per 100,000 persons.

Results:
From 10,176 initial entries, 24 manuscripts were included for review, featuring 30 BIA-SCC cases of which 25 were from the US, with a risk of 1:171,505 individuals with breast implants, which was 3.46 times less frequent than PSCCB's risk of 1:49,509 individuals, and 187.8 times less frequent than BIA-ALCL's risk of 1:913 individuals with textured implants.

Conclusions:
Our epidemiologic findings suggest that BIA-SCC is a very rare disease with an extremely low risk comparatively to other breast malignancies, as BIA-ALCL or PSCCB, making it a lesser threat than anticipated.

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Abstract No.: 129

Title : The association between silicone leakage and capsular contracture in 431 patients with intact silicone breast implants

Introduction:
Silicone leakage from breast implants has been suggested to trigger capsular contracture. The aim of this study was to determine if silicone leakage from intact breast implants to the breast implant capsule is associated with capsular contracture.

Materials and Methods:
We studied excision biopsies from patients undergoing removal or exchange of intact silicone breast implants. Patients with previous implant exchange were excluded. The silicone deposit in the implant capsule was quantified by histological analysis. The association between silicone content in the implant capsule and capsular contracture was tested using ordinary least squares regression and a paired analysis.

Results:
We included 431 patients with 690 breasts. The preoperative Baker grade examination categorized 377 breasts (55%) as Baker I, 154 breasts (22%) Baker II, 87 breasts (13%) Baker III, and 72 breasts (10%) Baker IV. Silicone leakage from intact implants was associated with increased risk of capsular contracture independently from the time of implantation ($p<0.01$). A stratified analysis showed that the association was only significant within the first 10 years of implantation ($p<0.01$) and not significant after 10 to 20 years ($p=0.11$) or above 20 years ($p=0.56$). The correlation between silicone leakage and capsular contracture was confirmed in a paired subgroup analysis of 51 patients with one breast with capsular contracture and a contralateral healthy breast.

Conclusions:
Our findings suggest that silicone leakage from intact breast implants plays a role in the development of capsular contracture particularly in the first 10 years of implantation. This highlights the importance of continuous improvement of breast implants to reduce the risk of complications.

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Abstract No.: 121

Title : Identifying Traits in the Breast Implant Microbiome that Leads to Capsular Contracture after Breast Augmentation: A Case-Control Study of 141 Implants using Next Generation Sequencing

Introduction:
Subclinical infection of breast implants has been suggested to trigger capsular contracture. However, few studies have used molecular methods to investigate the implant microbiome, and existing studies lack a control group. This study aimed to investigate the breast implant microbiome and to find potential microbial causes of capsular contracture.

Materials and Methods:
We included 141 implants from 72 healthy patients from a larger biobank to create groups with or without capsular contracture that were matched by time of implantation, implant brand and surface texture. Bacterial DNA was isolated from the entire implant surface using sonication and analyzed with amplicon sequencing of the hypervariable V3-V4 region of the bacterial 16S rRNA gene on the Illumina MiSeq platform.

Results:
We included 38 patients who acted as their own control by contributing with one breast with capsular contracture (Baker III/IV) and a contralateral healthy breast (Baker I). Sixteen patients were baker I bilaterally, 15 patients were Baker III/IV bilaterally and three patients contributed with one breast with Baker III/IV. We identified a rich network of bacteria in all samples with a total of 879 unique genera. The core implant microbiome consisted of Staphylococcus, Pelomonas and Micrococcus genera. The relative abundance of Staphylococcus was significantly higher on implants with capsular contracture than the control group ($p=0.004$).

Conclusions:
We identified a unique implant microbiome on all implants from healthy patients. Implants with capsular contracture had a higher relative abundance of the Staphylococcus genus compared with Baker I implants supporting the hypothesis that traits of the implant microbiome may cause capsular contracture.

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Abstract No.: 58

Title : Aesthetic Breast Augmentation using the Culture Expanded Stem Cell-Enriched Fat Grafting technique & emerging technologies: a preliminary study

Introduction:
Autologous fat grafting in breast augmentation and reconstruction has become globally accepted and routinely performed. There is general consensus that fat grafting to the breast is less predictable and often requires multiple treatments to reach a desirable breast enlargement. Recent studies suggest that adipose-derived stromal cells (ADSCs) can improve the volume retention of fat grafts to the breast.

Materials and Methods:
Patients treated with the Culture Expanded Stem Cell-Enriched Fat Grafting technique for cosmetic breast augmentations between 2020-2023 were included. Data including fat grafting procedure time, harvested & transplanted volume, harvest and recipient sites, total number of cultured expanded ADSCs and their viability were recorded. Patients had breast volume measurements before and six months after the treatment by 3D imaging. Safety was assessed by adverse events, and patient satisfaction was recorded at each visit.

Results:
Twenty-two female patients aged 25-52 years old were included in the study. All the patients underwent only one session of fat grafting. The harvested volume of fat ranged 1.2 to 2.5 liters. The range of cultured ADSCs were 22-31 billions cells and their viability 95%.The culture time was 2 weeks. The total transplanted volume per breast ranged between 220-250 ml. No major adverse events were reported to be related to the treatment. The surgeons were able to enlarge the breasts with a median of 172.1% (146.8-235.0%) of the initial breast volumes with a fat graft retention of 92.4% IQR (81.1-99.8%). Average patient's satisfaction rate at six months was 92 on the Breast-Q scale.

Conclusions:
Culture Expanded Stem Cell- Enriched Fat Grafting technique for aesthetic breast augmentation appears to be a safe and reproducible technique with no major adverse events with high fat graft retention rate and high patient satisfaction. A large randomised controlled study needs to be performed in order to confirm the results of this preliminary study.

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Abstract No.: 216

Title : Positive experience with care delivery influences a better satisfaction and quality of life after breast augmentation

Introduction:
Breast augmentation surgery ranks among the most frequently performed aesthetic procedures. Most studies predominantly focus on the evaluation of patient outcomes through validated patient-reported outcome measures (PROMs) while exploring various influential factors. However, the influence of care delivery, as quantified by patient-reported experience measures (PREMs), has not been thoroughly investigated. This study aimed to investigate the influence of PREMs on PROMs in patients who have undergone breast augmentation.

Materials and Methods:
Patients undergoing breast augmentation were enrolled in this multicenter cohort study. Patients completed both PREMs and PROMs prior to the surgical procedure and subsequently at the six-month postoperative time point. Univariate and multivariate regression analyses were conducted to investigate the effect of PREMs on PROMs.

Results:
In total, 329 patients were enrolled between the period from July 2018 to April 2022. There was a positive association between PREMs and PROMs scales according to the univariate regression analysis. The specific items of the PREMs, including the feeling of being heard, the opportunity to ask questions, and the feeling of having trust in their physician, were associated with the highest change in PROMs scores. After adjusting for patient characteristics, the multivariable regression analysis showed that PREMs accounted for a substantial proportion (19%) of the variance observed in PROMs, while patient characteristics including age, BMI, smoking status, cosmetic history and education level only affected the variance in PROMS for 1%.

Conclusions:
Enhancing the patient-reported experience will result in a higher patient-reported satisfaction and quality of life at six months postoperatively. Physicians should focus on giving the patients the feeling of being heard, giving them the opportunity to ask questions and giving them the feeling that they can trust their physician. The present study highlight the potential value of future research aimed at optimising the patient-reported experience which may result in more promising outcomes in breast augmentation patients.

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