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A clinical application report of Screw extruder 3D printed polycaprolactone mesh: various approaches in craniofacial bone defect

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Introduction: A Screw extruder 3D printing methods makes materials to uniform extrusion without final heat processing. In this way, it is appropriate that application of facial mesh made by Polycaprolactone (PCL)that approved by the FDA. It is known well to have considerable biocompatibility and biodegradability. In this study, we introduce several clinical application experiences in craniofacial bone defect.

Method: With retrospective study, the patient's information who underwent facial reconstruction with PCL mesh collected, within the period January to June 2023. This research is conducted as a multicenter study. Basic characteristics of operation detail collected. At the time of 6th month follow-up, we evaluated a stability of the mesh plate and any complications including infection and discomfort.

Result: A total of 26 patients with craniofacial bone defects were enrolled. The defect classified into four, skull, frontal, maxilla and orbital. 15.4% patients in frontal bone defect, 23.0% in maxillar bone defect, 57.7% in orbital defect and 2 patients in skull defect. The caused of defect was trauma 84.6%, osteomyelitis 7.6% and benign tumor removal 7.6%. And there are no complications from implants insertion, including infection at 6 months follow up.

Conclusion: In this study, we demonstrated that Screw extruder 3D printed polycaprolactone mesh can applicable in various craniofacial bone defect reconstruction. Also, surgery with PCL mesh plate showed sustained stability without definite complication. The result is comparable with the other conventional bioresorbable polymers mesh plate. This means PCL mesh plate can be a promising future material in craniofacial bone defect reconstruction.

A proposal for a new classification of complications in reconstructive and aesthetic breast surgery: the HIBA classification.

Presenter: Breyner Garcia Rodriguez, MD
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Background: Breast surgery lacks a standardized classification of postoperative complications. This leads to the presentation of varying rates of postoperative

complications and makes comparisons between studies difficult, hinders the final evaluation of the costs of this type of procedure and prevents reliable presentation of preoperative information to patients who consult for this type of procedure. The aim of this study is to apply a new complication classification developed by the authors to breast surgery.

Methods: We retrospectively evaluated 236 patients undergoing breast surgery with a follow-up of at least 6 months. Our classification of surgical complications consists of four grades of severity based on the complexity of the intervention required for treatment, the setting in which the patient is treated and the medical costs of treatment. Grade A includes complications that are treated in the outpatient setting. Grade B includes those that require the patient to return to the operating room or be hospitalized. Grade C corresponds to life-threatening complications requiring intensive care. Finally, grade D corresponds to the death of the patient. Each degree of severity is broken down according to the aforementioned criteria. The overall complication rate was calculated and complications were classified according to the proposed classification.

Results: A total of 236 patients undergoing breast surgery and with a follow-up of at least 6 months were included. The mean age was 47.6 years and 87.2% of the patients were female. One hundred and thirty-seven (58.1%) were reconstructive surgeries, while ninety-nine (41.9%) were cosmetic. Among the immediate reconstructive surgeries, six were autologous reconstructions (4.9%) and one hundred and sixteen were implant-based reconstructions (95.1%). Mastopexy with or without implant replacement or removal was the most performed procedure among cosmetic surgeries (24, 24.2%), followed by reduction mastoplasty (19, 19.1%). One hundred and thirty-eight (58.4%) procedures were inpatient. A total of one hundred and sixty-four complications were recorded in one hundred and fifteen (48.7%) patients. Of these, one hundred thirty-six (82.9%) were mild complications that were treated in the outpatient setting. Twenty-three (13.8%) of these complications did not require any additional intervention beyond those expected for the type of surgery (grade A1). On the other hand, 100 (60.9%) complications of the same degree of severity required some type of additional behavior or follow-up in the outpatient setting, and were classified as A2. Among the latter, the most frequent complication was stitch extrusion (24, 17.6%), which required an additional visit to the office for removal. Ten (6.0%) patients had to be reoperated with local anesthesia or under ultrasound or radiological guidance to resolve some complication, the most frequent cause within this group (grade B1) was seroma (3, 2.2%). Six (3.6%) patients had to be reoperated under general anesthesia (grade B3), the most common causes were capsular contracture (2, 1.4%) and implant exposure (2, 1.4%). There were no life-threatening complications or deaths within our cohort. Most complications occurred in the first postoperative month (99, 60.3%) and were grade A2 (67, 49.2).

Conclusions: The application of this classification system for surgical complications in breast surgery provides a valuable tool for standardized assessment, reporting of postoperative outcomes and evaluation of quality of care in the short, medium and long term. The number of complications recorded with this classification exceeds that of

traditional classifications such as Dindo-Clavien, which are foreign to our specialty, because our classification includes events such as pathological scarring and stitch extrusion, which prolong medical care times, require some type of additional treatment and have an impact on patient satisfaction. At the same time, this system allows surgeons to identify areas for improvement in surgical techniques and patient care protocols. Further investigation and validation of the classification system is warranted to optimize its utility in clinical practice and improve patient safety in plastic surgery procedures.

Advanced face lift combined with contour mandible fillers implantation in the women

Presenter: Guglielmo Rufolo, MD, MRM, FACS

Background: Surgical interventions addressing aging range from simple injection dermal fillers combine with facelifting surgery. This is a work taken last two years of my surgical practice of study. I'm trilled to tell my experience made through different methods and techniques in order to minimize the effect of facial wrinkles, voluming and restore a youthful on women. Fillers are a typical treatment mostly used for cosmetic and reconstructive purposes, but not always of unique choice. In some case report, I noticed that using the combination of both of treatments. Aesthetic surgical advanced facelifting combined with fillers injections improves facial contouring in term of youthful and less of complications. In conclusion, this study aimed to demonstrate specific cases where some of problematic of facial deformity are adjusted through a combination of dermal fillers with facelifting procedures or, in secondary approaching with fat grafting are substantially good. With that, it's important to know and manage recognizing the subdermal problematic of facial density and avoid filler complications with a multidisciplinary evidence-based approach to achieve functional and cosmetic outcomes.

Methods: Between May 2021 and November 2022, 23 patients were subjected to aesthetic facelifting surgical procedures combined with no permanent dermal filler. In few cases, fat grading been used in addition and checked under 6-month follow-up recorded.

Results: A total of 23 female patients between 30 and 65 years of age underwent of both procedures no permanent dermal filler removal in conjunction with facelift and fat grafting. The surgery was successful in all cases, but four cases of seroma well treated.

Conclusion: In this study, we present the characteristics of combining facelift and derma fillers or fat grafting procedures in order to achieve aesthetically favorable results.

AI-driven 3D video analysis in facial palsy: validity on face angles toward an assessment of spontaneous smile

Presenter: Keigo Narita, MD
Co-Author: Akihiko Takushima

Background: Recently, artificial intelligence (AI) has become a trend in scientific research and has been applied for automatic facial keypoint detection, which enables quantitative facial palsy assessment. One of the limitations of these system is that the accuracy of the measurements is dependent on the face angles in the images: yaw or pitch rotation is unacceptable. The movements in spontaneous smile have been less access to the objective evaluation, because these movements often involve head movements and patients seldom show spontaneous smile in medical office, especially on a rigid fixation of the face. Therefore, we have developed a new facial palsy assessment tool using AI-driven video analysis, in which the three-dimensional distances traveled by the keypoints are estimated. The purpose of this study is to clarify the impact of yaw or pitch rotation on our assessment tool.

Methods: The study population consisted of 21 unilateral facial palsy patients with varying severities. Movies of voluntary grinning were recorded in one frontal view and four oblique views which were turned to the healthy side, affected side, upper side, and lower side at an almost 30-degree angle. By analyzing these movies with our assessment tool, the 3D distances traveled by the point of oral commissure when grinning (commissure excursion: CE) were calculated in the healthy side and affected side, and the differences between the two were calculated. These values were normalized with the inter-inner canthal distances and were defined as negative values when the oral commissure moved medially. CE in four oblique views were compared with CE in frontal view.

Results: The differences of CE (mean ± SD) in the frontal, healthy-oblique, affected-oblique, upper-oblique, and lower-oblique view were 0.22 ± 0.17, 0.16 ± 0.12, 0.27 ± 0.19, 0.18 ± 0.16, and 0.27 ± 0.14, respectively. In comparison with the frontal view, there were significant increase in the affected-oblique view ($p=0.028$) and the lower oblique view ($p=0.032$) and decrease in the healthy-oblique view ($p=0.006$) and the upper oblique view ($p=0.016$). The difference of CE in each oblique view showed a strong correlation with that in the frontal view ($r = 0.80 \sim 0.92$, $p<0.0001$). CE in the healthy or affected side showed similar results.

Conclusions: This study suggests that our method may cause a margin of error in evaluation of CE due to the face angle, but the error can be corrected by simple linear regression. AI-driven 3D video analysis is expected to be a solution for quantitative assessment of the movements in spontaneous smile.

Anatomical study of frontal sinus in 184 specimens and correlation with 10 frontal trauma's cases

Presenter: Liliana Scarpinelli, MD
Co-Author: SANTIAGO GONI

The frontal bone is the strongest component of the craniofacial skeleton. It can withstand between 800 and 2200 pounds of force before fracturing, but note that when Type B (large) of frontal sinus is present, fractures are frequently observed in trauma with minor forces.

Frontal sinus fractures represent 5 to 12 percent of all craniomaxillofacial fractures, with high-velocity blunt force representing the majority(1,2). Concomitant facial fractures along with associated intracranial and bodily injuries confirm their severity. Assaults and vehicular trauma account for the majority of frontal sinus injuries (3,4). The management of frontal sinus injury is an important topic, as inappropriate management of these injuries not only leads to cosmetic deformities and functional problems. This study describes four anatomical patterns associated with frontal fractures, established through images, cadaveric experimentation in skulls and retrospective analysis in 10 cases.

MATERIALS AND METHODS: Traditionally frontal sinuses are anatomically described as two triangular pyramid-shaped cavities with apex and base frame on either side of the midline. According classical anatomist as Leo Testut who describes four patterns, we have studied frontal sinus in 15 human skulls and 184 scan images of Medicine School of National University of La Plata City, and were correlationed with 10 frontorbital trauma cases. An investigation of frontal sinus studied and classified looking for the presence of this kind of variable.

We were focused in the classification of 4 types. Common patterns have been well established previously. Type A: supraciliar development extended in width, type B: sinus greater than 3.5 cm of surface: "largest sinus", extended height and front wall of 1-2mm thick, type C: digital type: 1 or less centimeter and medial size, and type D: small orbital location.Type B sinus are directly relacionated with this kind of fractures. The importance of an adequate and early diagnosis are the basement of treatment. Patients: Clinically, an institutional review board–ap- proved retrospective study of patients with frontal fractures admitted to the Spanish Hospital of La Plata, from 2000 to 2020 was conducted.

RESULTS: The arrangement was the most common morphological type C Testut (digital), followed by type B (big sinus), type D and finally type A.

According 184 images: 111 were high resolution computed tomography, 43 of paranasal RX. At the right side: 31 sinus were typo A, 41 type B, 53 type C and 18 de type D. 7 were absent, and 4 were complete (without septum). On the left side: 31 type

A, 43 type B, 49 type C, 24 type D, and 3 were absent. According ages: the range was from10 to 76 years, and about gender, results were similar: 113 type B were in men and 71 in women. Finally: from 84 sinus: 35 were bilateral, and 49 unilateral.

CONCLUSIONS: The results show that the presence of type B pattern ranks in second frequency in scans, skulls and cases, therefore, should be considered their existence on traumatic and minor processes that compromise this zone, to evaluate treatment, surgical approach and aesthetic or functional consequences.

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Application of Augmented Reality technology to ensure the safety of lipofilling of the gluteal area

Presenter: Akhmed Rakhimov MD

Abstract Co-Author: Sofia Abdulaeva

Relevance: In recent years, there has been an increased interest in lipofilling of the gluteal regions. At the same time, a relatively high level of risk of fat embolism is statistically reliably shown. When performing lipofilling manipulation of the gluteal areas, the key point is the accuracy of the introduction of adipose tissue into the subcutaneous space, excluding it from entering the muscle. According to paragraph 2 of the Resolution adopted by a group of professional communities ISAPS, ASPS, PSF, ASER, ISPRES, IFATS dated October 28, 2022, lipofilling of the gluteal areas is recommended to be performed under ultrasound control in real time [5]. In the process of performing autotransplantation of adipose tissue using ultrasound equipment, the operating surgeon takes the information from a monitor standing to the side and out of sight. At the same time, a shift in the specialist's attention is noted, which potentially increases the likelihood of a technical error in conditions of "distracted" task performance. For example, "visual inattention"-looking away from the road while driving forward-is one of the most significant contributing factors to car accidents and related situations. In 2020, 3,142 people died in car crashes involving distracted drivers in the United States,

according to a report from NHTSA. The report states that 80% of car crashes and 16% of road fatalities are the result of distracted drivers [3].

Augmented Reality (AR) is one of the promising areas of modern science [1], which is actively being introduced into various fields of activity, including plastic surgery. Using an AR headset, the operating surgeon can see the image of the ultrasound machine monitor displayed on special glasses. In this regard, today the issue of using augmented reality using an AR headset when performing lipofilling of the gluteal areas is relevant.

Purpose of the study: Increasing accuracy and safety, improving the results of lipofilling of the gluteal areas through the development and implementation of an ultrasound control and visualization method with elements of augmented reality technology. Development and implementation of an ultrasound guidance and visualization method with elements of augmented reality technology to reduce potential risks associated with short-term distraction during plastic surgery.

Material and research methods: An analysis of foreign and domestic literature sources devoted to these issues was carried out [2]. A review and analysis of the technique of lipofilling operations of the gluteal regions with ultrasound control in real time in augmented reality conditions was performed. Based on the Institute of Plastic Surgery and Cosmetology, within the framework of the educational program of the Training Center "The School of Body Sculpting", since 2020, in 50 clinical cases, complex operations to correct body contours were performed, including subcutaneous lipofilling of the gluteal areas, using ultrasound navigation in combination with augmented technology reality with visualization on AR glasses.

Results: A method for objective control of the safe performance of lipofilling of the gluteal regions using ultrasound control and continuous visualization of the image on augmented reality glasses in front of the eyes of the operating surgeon was developed and tested without switching attention to the monitor of an ultrasound machine standing to the side and out of sight.

Conclusions: This article summarizes and analyzes the latest literature data on the capabilities of ultrasound technology and proposes the author's method of combining lipofilling of the gluteal areas with visualization of the image of the ultrasound machine monitor on the operating surgeon's AR glasses. The use of this approach is part of our safety concept and helps reduce potential risks during "distract" manipulation and thereby increases the accuracy and safety of the surgical procedure [4,5].

Key words: Fat grafting, injection autotransplantation of adipose tissue, lipofilling of the buttocks, fat embolism, augmented reality, Augmented Reality, AR headset

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Artificial intelligence program capable of identifying flaps and their evolution on thermographic images

Presenter: Danciu Razvan

Co-Author(s): Laura Raducu, MD, PhD, Cristian Radu Jecan, MD, PhD, FEBOPRAS

Objectives: The objective of this study is to develop a program capable of identifying flaps on thermographic pictures. Once identified, he can study their temperature and thus identify a possible complication, being extremely useful in postoperative flap monitoring.

Methods: To create this algorithm, we used photographs obtained from 100 patients who underwent a local, pedicled or a free flap to cover a defect. Data processing involves two stages, one of medical interpretation of the pictures in accordance with the clinical data, the evolution of the patient and the flap. The second consists in entering the data into a computer program capable of interpreting the data and obtaining new values based on artificial neural networks. We used an algorithm that uses convolutional neural networks, which are able to take the information from a picture that they divide up to the pixel level. Then, through the "pattern recognition" method, he succeeds in reconstructing the image, obtaining the image of the flap. In order to increase the number of training images and enhance its efficiency, we have also developed an algorithm that generates flap-like images, images used strictly for training purposes, without clinical value.

Results: After running the program, it produces a black-and-white matrix that corresponds to the flap area (which it considers to be a flap based on the learning process it was previously subjected to). After obtaining the matrix, the program can superimpose this matrix with the initial picture and thus give us access to every pixel of the area corresponding to the flap. The program can also identify the exact temperature of each pixel and thus produce a thermal map of the flap with impressive accuracy. The algorithm also interprets the results obtained and determines a prediction in the form of a confidence interval showing the possibility that a portion or the entire flap may evolve unfavourably.

Conclusions: Using a medical tool (thermal camera) and an efficient and fast program, we can obtain medically important results that can warn us of a tissue injury before it becomes clinically visible and so we can act promptly, reducing long-term complications of flaps.

Artificial Intelligence-Based Aesthetic Outcome Evaluation for Mandibular Reconstruction – Comparison among Vascularized Bone Grafts, Mandibular Reconstruction Plates, and Soft Tissue Flaps

Presenter: Takeaki Hidaka MD

BACKGROUND: Although vascularized bone graft (VBG) transfer is the current standard for mandibular reconstruction after segmental mandibulectomy, reconstruction with a mandibular reconstruction plate (MRP) and reconstruction with a soft-tissue flap (STF) alone remain crucial options for patients with advanced age or poor general condition because of their simplicity and less invasiveness. Restoration of aesthetic symmetrical contour of the lower face, as well as restoration of function with fewer complications, is a primary goal of mandibular reconstruction. However, existing algorithms for selecting these three methods lack cosmesis evaluations based on objective measures. Recent advances in artificial intelligence (AI) have enabled objective and quantitative evaluation of facial symmetry (references 1–3), offering the potential for novel beneficial measures for aesthetic outcomes of mandibular reconstruction. This study aimed to apply an AI-based facial asymmetry evaluation system to compare long-term aesthetic outcomes of MRP and STF with VBG.

METHODS: This single-center retrospective chart review included patients who underwent immediate mandibular reconstruction after segmental mandibulectomy from 2015 to 2022. Patients without follow-up photographs at ≥6 months after surgery were excluded. Primary outcome was the mandibular asymmetry value, which was calculated for each patient's latest follow-up photograph using freely available facial recognition AI (reference 2). The AI algorithm automatically detects 12 landmarks on the mandibular contour and defines a facial midline. The mandibular asymmetry value quantifies deviation from an ideal, completely symmetric mandibular contour in terms of the facial midline, with a higher value indicating worse asymmetry. Functional outcomes and complication rates were also investigated.

RESULTS: In total, 65 patients were included: VBG, 33; MRP, 19; and STF, 13. Mandibular asymmetry values were evaluated 22.8 months after surgery, on average. The values were 0.075 ± 0.038, 0.085 ± 0.043, and 0.111 ± 0.072 for the VBG, MRP, and STF groups, respectively (mean ± standard deviation). The MRP group had a value comparable to that of the VBG group (¬p = 0.704) regardless of anterior or posterior mandibular defect types. The STF group had a significantly higher value than that of the VBG group (p = 0.046). A multivariable linear regression analysis identified

reconstruction with STF alone as a significant risk factor for worse asymmetry (coefficient, 0.040; 95% CI, 0.003–0.076), while mandibular defect type was insignificant. No significant differences were found in complication rates and functional outcomes.

CONCLUSIONS: The AI-calculated mandibular asymmetry value was free from interobserver bias and enabled a completely objective and reproducible analysis of factors affecting mandible asymmetry among different reconstruction techniques. In terms of function and complication rates, both MRP and STF are good second alternatives to VBG. Regarding cosmesis, however, STF was inferior to VBG, whereas MRP was comparable to VBG, even for anterior defects for which rigid reconstruction is mandatory. MRP can be considered as an intermediate option between VBG and STF and may be preferable especially for the cases with anterior defects when VBG is contraindicated.

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Assessment of Critical Tissue Perfusion - Thermal vs Hyperspectral Imaging

Presenter: Zlatko Vlajcic MD, PhD, Plastic Surgeon,
Co-Author: Rado Zic MD

Assessment of critical tissue perfusion (especially skin) significantly affects the outcome of reconstructive procedures both intraoperatively and in the early postoperative phase. It is no less significant when assessing the vitality of a replanted finger, "degloving" injuries, avulsion injuries or frostbite and burns. We compared the performance of an expensive spectral camera with a much cheaper thermal camera in this evaluation and assessment.

Autologous fat grafting in breast augmentation: A systematic review highlighting the need for clinical caution

Presenter: Ishith Seth MD

Abstract Co-Author: Warren Rozen MBBS MD FRACS PhD

Background: Autologous fat grafting (AFG) is a breast augmentation method for treating volume and contour abnormalities. This systematic review aims to summarize complications, radiological safety, volume retention, and patient satisfaction associated with AFG.

Methods: PubMed, EMBASE, Google Scholar, Cochrane CENTRAL, Wiley library, clinical key/Elsevier, and EBSCO databases were searched for relevant studies from January 2009 to March 2022. Articles describing AFG for breast augmentation were selected based on pre-determined inclusion and exclusion criteria. PRISMA guidelines were adhered to, and the study was registered on PROSPERO. The ROBINS-I assessment was used to assess the quality of studies and the risk of bias was measured using the ACROBAT- NRSI.

Results: Total of 35 studies comprising 3757 women were included. The average follow-up duration was 24.5 months (range, 1-372 months). The overall complication rate was 27.8%, with fat necrosis making up 43.7% of all complications. Average fat volume injected was 300mls (range: 134-610ml) and average volume retention was 58% (range: 44-83%). Volume retention was greater with supplementation of fat with plasma-rich-protein (PRP) and stromal vascular fractioning (SVF). The most common radiological changes were fat necrosis (9.4%) and calcification (1.2%). After follow-up of one-year, patient satisfaction was on average 92% (range; 83.2-97.5%). The included studies were of good quality and consisted of a moderate risk of bias.

Conclusions: AFG was associated with an overall complication rate of 27.8%, and additional supplementation of fat with PRP and SVF may improve graft survival. Despite poor volume retention being a persistent drawback patient satisfaction remains high. Despite volume retention being a persistent drawback, patient 326 satisfaction remains high. Future studies should improve follow-up durations to confidently assess the oncological safety of AFG in breasts.

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Breast implant-associated anaplastic large cell lymphoma: an atypical diagnosis

Presenter:: Carla Combalia Larraga
Co-Authors: Enrique Ruiz Gil, Noemí Barandela Rey, Eva Maria Moreno Diaz

Objective: Breast implant-associated Anaplastic Large Cell Lymphoma (BIA-ALCL) is a rare type of T-cell lymphoma that typically manifests in the capsule or periprosthetic fluid. The objective is to present a case of BIA-ALCL diagnosed at our center, which presented atypically through the presence of costal masses.

Materials and Methods: Retrospective description of a case of BIA-ALCL, occurring 4 years after prosthetic breast reconstruction following breast cancer. During an ultrasound review, with no apparent clinical symptoms, capsule rupture is suspected. Confirmation is obtained through nuclear magnetic resonance, and a decision is made to intervene for prosthesis removal.

Results: Following prosthesis removal, which in this case were macrotextured anatomical implants, the presence of intracapsular whitish material and multiple costal masses is observed. Biopsy results confirm anaplastic large cell lymphoma. A comprehensive staging study rules out nodal and metastatic involvement, leading to a second intervention for costal resection and reconstruction using prosthetic material and a pedicled wide dorsal flap. Breast reconstruction is deferred for the time being.

Conclusions: BIA-ALCL is a rare type of lymphoma recently associated with the use of breast implants, with the strongest association being with macrotextured implants, some of which have been withdrawn from the market. We present this case to underscore the significance of the disease, the possibility of atypical presentations, and the necessity of reconstructive surgery in its treatment.

Breast Reduction Post DIEP Flap: Is It Safe?

Presenter: Shahad Alalawi MD
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OBJECTIVE: The purpose of this study is to demonstrate the practicality of doing a breast reduction procedure on patients who have had a breast reconstruction using a deep inferior epigastric flap (DIEP) flap.

INTRODUCTION: Debulking breast flap surgery post breast reconstruction is occasionally required (1). Here,we provide a novel approach-one that has never been described before-that uses a superomedial pedicle inverted "T" technique for breast reduction in patients who have had prior free DIEP flap breast reconstruction. We propose that after a free DIEP flap breast reconstruction, a breast reduction technique is a safe and reasonable alternative procedure.

METHODS: The study focuses on breast reduction in women who have had free DIEP flap breast reconstruction using the superomedial pedicle inverted "T" technique. Results: Given the satisfactory survival of the debulked DIEP flaps, our observations suggest that employing the superomedial pedicle inverted "T" breast reduction technique in reconstructed breasts with DIEP free flaps shows great potential. (2,3,4)

CONCLUSIONS: We propose an alternative approach for secondary breast reshaping after DIEP flap reconstruction, by utilizing superomedial pedicle inverted "T" breast reduction technique. Potential benefits of this approach include maintaining blood circulation and
protecting the pedicle (5). However, due diligence is required due to the scant evidence that is currently available and the superior surgical skill and expertise that is required. Still, this method shows promise for performing breast reductions after free DIEP flap breast reconstruction.

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CLINICAL APPLICATIONS OF STROMAL VASCULAR FRACTION: A SYSTEMATIC REVIEW

Presenter:
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Introduction:
One of the most important characteristics of adipose tissue is that it is a source of regenerative cells [1]. Today, it is known that in addition to this ability, adipose tissue stem cells, have antiapoptotic [2], antioxidant, anti-inflammatory and immunomodulatory properties [3] .
The stromal vascular fraction (SVF) is an important source of blood vessel-associated cellular phenotypes, including pericytes, endothelial progenitors, mesenchymal progenitors, supra-adventitial adipose stromal cells, and endothelial cells [4].The SVF has been widely explored by various medical specialties in various clinical situations because its use is a promising possibility for clinical applications.

Methods:
The study was performed in the Medline, Lilacs, and Embase databases, covering studies published from 2012 to 2022, in Portuguese, Spanish and/or English. Studies were included if they were clinical trials, prospective and retrospective cohorts, case series and case reports, only in humans and that used enzymatically extracted stromal vascular fraction. Finally, 62 studies were included.

Results:
A total of 41 different therapeutic applications were found. The most prevalent therapeutic applications were osteoarthritis of the knee (n = 9; 14.5%) and volume restoration in breast reconstruction (n = 6; 9.7%). Most studies reported statistically significant clinical benefits in the results (n = 56; 90.3%); 3 studies were designed to evaluate safety only, and the remaining 3 reported did not offer benefits.
The most prevalent routes of administration were subcutaneous (n = 16; 25.8%) and intra-articular (n = 15; 24.2%). Two intravenous applications were performed and demonstrated safety, with no reports of adverse effects.
Of the 62 studies, only 20 (32.26%) reported the presence of adverse events (AEs), among which 17 studies declared that the AEs were somehow directly related to the type of intervention performed. No serious adverse events were reported.

Discussion:
The use of the SVF for the benefit of patients, especially for diseases for which we currently do not have well-established effective therapies such as neurodegenerative diseases, autoimmune diseases, heart diseases involving areas of tissue necrosis, erectile dysfunction and many others, is encouraging, opening the possibility for new studies to test new applications and further exploring the regenerative, immunomodulatory and anti-inflammatory potential of SVF.

Conclusion:
The applications found, their results and safety, confer legitimacy to the establishment of new therapeutic hypotheses and deepening our understanding of the investigations

already conducted.

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Cosmetic surgery of female genitalia in the digital communication's era: Is "normal" the normality?

Presenter: Alice Patrignani

Introduction: In the digital age, social media has transformed the way individuals communicate, seek information, and make decisions. In this sense, the realm of healthcare is no exception, as social media has played an important role in shaping the dynamic between doctors and patients and in influencing the decision-making process for patients undergoing surgery, including female genital cosmetic surgery (FGCS).

Materials, methods and results: This study has the purpose to investigate the increasing importance of social media in the medical field, specifically examining how these platforms can influence patient's self-perception and decisions regarding their choice to undergo FGCS. A web based survey made by 13 questions was administrated through social media such as Instagram, Facebook and Whatsapp. Patients were recruited in the period between June 2023 and February 2024, and their participation was anonymous and voluntary. They were asked to give answers to multiple questions. We obtained 1389 responses, 1384 meet the inclusion criteria (= female sex).

Discussion: Plastic surgery interventions on female genitalia can have a significant impact on the quality of life for patients, addressing functional issues such as reducing friction or irritation, discomfort during physical activities, dyspareunia, and challenges in maintaining intimate hygiene. Additionally, these interventions can contribute to psychological well-being by boosting self-esteem.
However, these procedures are not without complications, and that is why it is important for patients not to perceive a "normalcy" based on overly standardized models that pathologize anatomical variations.

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Cutaneous Melanoma at initial diagnosis in the male population. The experience of one center in Bucharest, Romania.

Presenter: Vasiu Luiz-Sorin

Co-Authors: Laura Raducu MD, PhD, Cristian Radu Jecan MD, PhD, FEBOPRAS

In 2022, 2247 patients were diagnosed with cutaneous melanoma in Romania, according to the European Cancer Information System estimates (1).
Cutaneous melanoma is an important public health concern, and its incidence is increasing worldwide. Understanding the characteristics of patients diagnosed with cutaneous melanoma is essential for improving prevention, diagnosis, and treatment strategies.
This current investigation constitutes a retrospective population-based cohort study. Data was retrieved from the database of our hospital in Bucharest. Patients selected from the database are male patients who were diagnosed primarily or were admitted for surgical treatment for cutaneous melanoma in the plastic surgery department of our hospital between January 2017 and December 2022. Patients with incomplete data were excluded from the study.

During this 6-year period, in our plastic surgery department, 66 male patients received surgical treatment for cutaneous melanoma. The most frequent involved sites for melanoma lesions are the posterior thorax - 37.9% of cases, the lower limbs – 21.2% of cases, and the head – 16.7% of cases, totaling 75.8%. Regarding the distribution of

histological subtypes, superficial spreading melanoma was detected in 39.4% of cases and nodular melanoma was detected in 48.5% of cases, accounting for 87.9% of cases. Regarding TNM T classification, the majority of lesions were diagnosed in TNM T4 (T4a 9.1%, T4b 25.8%), T4b lesions accounting for the highest proportion. Breslow index analysis for 64 patients (2 patients with Tis excluded) yielded a mean of 5.3 mm, median of 3.2 mm, ranging from 0.3 mm to 32 mm.

The present study provides insights into the demographic and clinical characteristics of male patients diagnosed with cutaneous melanoma in Bucharest, Romania. Results from this research demonstrate the need for education and prevention aimed at improving early detection of cutaneous melanoma in the Romanian male population.

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Development of Fish Oil Based Gel for Drug Delivery System to Prevent Capsular Contracture

Presenter: Woo Jin Song Prof.
Co-Author: Sang-Gue Kang MD

Background: Capsular contracture remains a formidable obstacle in the field of cosmetic and reconstructive breast surgery, leading to increased patient morbidity and the need for surgical revision. Traditional interventions have shown limited efficacy, prompting the exploration of new avenues for prevention and treatment. The development of NE-ω3-gel represents a breakthrough approach, leveraging the anti-inflammatory and anti-fibrotic properties of omega-3 fatty acids encapsulated within a nanoemulsion gel to address this issue head-on.

Methods: The comprehensive study methodology encompassed the synthesis, characterization, and application of NE-ω3-gel. Initial phases involved rigorous assessment of the gel's thermoreversibility, particle size distribution, and drug release properties to ensure optimal delivery and efficacy. The experimental design included thirty female Wistar Hannover GALAST M type rats, divided into three groups to evaluate the gel's performance against controls. These groups included a standard control, a positive control receiving direct fish oil supplementation, and an experimental group with breast implants coated in NE-ω3-gel. The study extended beyond physical and chemical assessments to include histological examinations and gene expression analysis, providing a holistic view of the gel's impact on preventing capsular contracture.

Results: Findings from this study were profound. NE-ω3-gel demonstrated exceptional thermoreversibility and a consistent particle size, suggesting its stability and reliability as a delivery system. Most notably, the application of NE-ω3-gel significantly mitigated the

development of capsular contracture in the experimental group. This was evidenced by substantial reductions in capsular thickness, fibrosis, and the proliferation of myofibroblasts, which are key contributors to the contracture process. Furthermore, gene expression analysis revealed a favorable shift in inflammatory and fibrotic markers, with an increase in IFN-γ and decreases in IL-4 and TGF-β2, highlighting the gel's potent anti-inflammatory and anti-fibrotic effects.

Conclusion: The exploration of NE-ω3-gel in this study illuminates its potential as a revolutionary intervention for the prevention of capsular contracture post-breast implant surgery. By significantly impacting the physiological processes underlying capsular contracture, the NE-ω3-gel offers a promising solution to a longstanding problem in breast surgery. Its unique attributes, including thermoreversibility, particle size stability, and efficient drug delivery, position NE-ω3-gel as a viable and effective treatment option. The implications of this research are far-reaching, providing a foundation for further clinical trials and the potential integration of NE-ω3-gel into standard postoperative care, ultimately aiming to enhance patient outcomes and satisfaction in breast implant procedures. This study not only contributes to the scientific community's understanding of capsular contracture but also opens new pathways for innovative treatment approaches in the field of cosmetic and reconstructive surgery.

Direct Brow Lift: A technique for selected group of patients

Presenter: Muhammad Ahmed MD, MBBS, FCPS

Objectives: Direct brow lift allows for rapid, powerful, and predictable elevation of the brows. Direct brow lift is appropriate for individuals who desire an elevated brow and are not too concerned about the scar.

Introduction: Facial aesthetic procedures are commonly performed to address the ptotic facial tissues.
None of the brow lift techniques are completely satisfactory because of their limited effectiveness, lack of longevity and potential complications.
Eyebrow ptosis occurs in older persons because of gravity and aging. As the brow moves inferiorly, the frontalis muscle is recruited to elevate the eyebrow, which may result in deep horizontal forehead lines. Frontalis muscle fibers do not extend to the lateral brow, so despite maximum frontalis contraction, lateral brow ptosis often persists.

The goal of the surgery is to achieve the optimal height and contour of the brow with minimal scarring and downtime and maximal predictability.
Location and length of the incision (supra brow cilia vs mid /lower forehead) is chosen depending upon the degree and extend of ptosis and location of the forehead rhytids.
As most brow ptosis is usually in the mid to lateral brow area, incision on the medial 1-2 cm for forehead should be avoided as it can leave a visible scar without achieving major

improvement.

Material and methods: The aim of the study was to review all direct brow lift procedures carried out between January 2022 to December 2023. All cases were performed under local anaesthesia.
Results: 35 cases were performed at the ASC as a day case procedure. The mean age was 62 years. The surgery time ranged from 22-30 min. The follow up period ranged from 6-24 months. Most patients were satisfied with the outcome.

Conclusion: Direct browlift is most effective and predictable technique for addressing static brow position and in cases of unilateral brow ptosis.

Effect of abdominal binders on the perception of safety and comfort in abdominoplasty patients: a randomized clinical trial.

Presenter: Erik Friedrich
Co-Authors: Leandro Aguiar, MD, Fabio Nahas, MD, PhD, MBA, FACS, Lydia Ferreira MD, PhD

Background: The wearing of abdominal binders following abdominoplasty has been widely indicated by plastic surgeons (1), as it may reduce postoperative complications, although it is also associated with increased risk of thromboembolic events (2,3). However, to date, the association of wearing a binder with perceived safety and comfort among abdominoplasty patients during the postoperative period has not been evaluated.

Objective: To assess perceived safety and comfort among abdominoplasty patients wearing or not wearing an abdominal binder postoperatively.

Methods: Thirty-six women were randomly assigned to wear an abdominal binder (binder group) or not wear a binder (no-binder group) following classic abdominoplasty. The participants were assessed preoperatively and at 30 days postoperatively using the Body Attitudes Questionnaire (BAQ) – Brazilian version, and a 7-item study-specific questionnaire assessing whether wearing or not wearing an abdominal binder following operation affected the patient's perception of safety and comfort.

Results: There were no significant differences in mean BAQ scores between groups at the different time points ($p = 0.268$). Intra-group comparisons between pre- and postoperative scores of the study-specific questionnaire showed statistical differences for item 1 ($p = 0.001$), item 2 ($p = 0.043$), and item 6 ($p = 0.017$) associated with the perception of safety and comfort among patients who did not wear of an abdominal binder following abdominoplasty.

Conclusion: Abdominoplasty patients who did not wear an abdominal binder after surgery had a positive perception of safety and comfort in the postoperative period.

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Efficacy of proximal medial branch in DIEP flap for breast reconstruction using Hartrampf zone IV

Presenter: Hitomi Matsutani MD
Co-Authors: Tomohiro Shiraishi, Yukihiro Kita, Akihiko Takushima

Purpose: When performing breast reconstruction using a deep inferior epigastric artery perforator (DIEP) flap, it is important to harvest the flap with sufficient volume and stable perfusion. When the volume of the excised mammary tissue is large, DIEP flap tissue is often needed up to zone IV to reproduce natural breast morphology. In contrast, the blood flow across the midline to zones II and IV is often insufficient, and it is necessary to harvest a flap that includes bilateral deep inferior epigastric artery (DIEA) perforators, resulting in a larger sacrifice of the harvested area. To reduce the invasiveness of the lower abdomen, we hypothesized that a proximal medial branch (PMB), which is the most proximal perforator of DIEA previously reported in Japan by Takeishi, may make it possible to obtain adequate perfusion in a unilateral DIEP flap. This study aimed to clarify the detailed anatomical characteristics of PMB and its potential clinical application in breast reconstruction.

Methods and materials: A retrospective study was conducted on 30 patients who underwent breast reconstruction using DIEP flaps between May 2020 and July 2023. Patient demographics were obtained from medical records, and PMB anatomy was analyzed using the data collected from preoperative contrast-enhanced computed tomography angiography. The effect of PMB blood flow on contralateral perfusion of the flap, zone II and IV, was estimated using intraoperative indocyanine green angiography, and the points to note during surgery were investigated using operative data.

Results: PMB was present in approximately 80-90% of the cases, arising from a common trunk of DIEA near the point where DIEA passes through the lateral border of

the rectus abdominis, and branching caudomedially in over half of the cases. PMB traveled medially for an average distance of 2.8 cm before entering the rectus abdominis and perforated the anterior rectus sheath 2.3 cm laterally and 8.8 cm caudally on average from the umbilicus. When PMB was included in DIEP flap, the average perfusion ratio of the contralateral side of the flap significantly expanded from 74.2% to 96.5% in zones II, and from 21.8% to 74.1% in zone IV, and nine of 22 cases showed perfusion to the entire zone IV. Intraoperative findings include that PMB sometimes run between the external and internal oblique aponeuroses at the anterior sheath, and the pedicle length may be inadequate for utilizing the thoracodorsal artery as a recipient vessel.

Conclusions: PMB had a relatively consistent anatomical feature and was present in most cases, providing a reliable and enlarged contralateral perfusion of DIEP flap. By this study, a unilateral DIEP flap with PMB is shown as a novel good option for substantial-volume breast reconstruction. The preoperative evaluation using CT angiography allows us to confirm the location of PMB and whether it is indicated for use, consequently reducing the sacrifice of the donor site and leading to efficient surgical planning.

Evaluation of cell survival theory versus cell replacement theory in fat grafting: An experimental study with human fat and murine models using xenograft

Presenter: Heewoong Yang MDb
Co-Authors: Jaewoo Kim MD, Ki Yong Hong, Hak Chang MD, PhD, Professor

Introduction: Fat grafting is a common procedure performed in plastic and reconstructive surgery. Previously, graft retention was explained by cell survival theory, which explains graft retention in terms of survival of adipocytes after grafting. However, recent animal studies suggest that cell replacement theory, which explains that graft volume retention is achieved by newly differentiated adipocytes from ASCs. This study aimed to analyze and validate the two theories on human fat and examine the role of adipose matrix in graft retention.

Methods: Human lipoaspirate was harvested from patients and was centrifuged, divided into purified fat. Further centrifugation after mechanical emulsification was done to separate adipose matrix. The two samples were assessed for viability with counting viable cells under microscope.

The purified fat and adipose matrix were injected into dorsal flanks of 8-week-old nude male mice. At postoperative day 30, graft weights were measured, and volume was calculated by micro-CT scans. Tissue samples were also obtained and analyzed with secondary washing for CD31, perilipin, and vessel density in the two groups.

Results: Before grafting, almost all adipocytes survived in purified fat, while there were only a few viable adipocytes in adipose matrix. After postoperative day 30, the grafted fat weight was significantly higher in the adipose matrix group than the purified fat group (purified fat group: 0.18 ± 0.04 g, adipose matrix group: 0.27 ± 0.04 g, $p < 0.001$, $n = 11$) . The volume retention rate to initial volume was significantly higher in the adipose matrix group. (purified fat group: 68.65 ± 10.78%, adipose matrix group: 118.27 ± 21.75%, $p < 0.05$, $n = 4$-5). Also in the adipose matrix group, adipogenesis and angiogenesis rates were much higher than the purified fat group, measured with CD31, perilipin, and vessel density analysis.

Conclusion: Although further research may be needed, cell replacement theory seems a promising and reliable theory than cell survival theory, when experimented with human adipocytes and murine models.

EXPERIMENTAL ANIMAL MODELS IN FACIAL TRANSPLANTATION RESEARCH- A SYSTEMATIC REVIEW

Presenter: Ana Belen Gutierrez Rodriguez MD
Co-Authors: Rafael Araujo, An Ching MD PhD, Lydia Ferreira MD, PhD

Introduction: Face transplant is a vascularized composite allograft (VCA) used mainly in plastic and reconstructive surgery1. Since the first successful hand transplant2 in 1998, the development of different types of VCA and clinical applications have been challenged by the requirement for lifelong immunosuppression in order to avoid graft rejection. Advances in regenerative medicine and tissue engineering have made VCA a good option for patients suffering from tissue defects due to traumatic injuries, congenital deformities, or cancer3. The main goal of transplantation is to improve motor, sensory, and communicative functions. In recent years, experimental animal models have boosted the study of VCA. This review analyze the experimental work on face transplantation involving animal models.

Methodology: The search was conducted in the MEDLINE, LILACS, Cochrane and Scielo databases to select articles published from 2006 to 2022, written in english, portuguese and spanish. The articles must address face transplantation (partial or total) in animal models. A total of 37 publications were considered.

Results: There were analyzed 15 publications involving rodent models, 12 using swine animal models and 10 involving other animal experimental models.

Discussion: Animal models of vascularized composite allograft (VCA) have become relevant for establishing a robust scientific basis for advancing face transplantation in humans. Due to the possibility of using pure and genetically defined strains, the available molecular units, and the availability of monoclonal antibodies, rodents are useful tools for basic immunological studies4. On the other hand, because they

resemble human models, large animal experiments allow anatomical dissections with better visualization. With this, it is possible to obtain relevant data and enough experience to start human experiments5.
The available data shows that animal models are valuable resources for studies in face transplantation. As more data becomes available, estimates of sensitivity, specificity, and accuracy can be refined. Current clinical challenges in face transplantation revolve around the risks of immunosuppression, achieving recipient-specific tolerance, and optimizing nerve regeneration. Knowledge accumulated with animal models can be combined with clinical experience to refine understanding of the functional and immunological challenges of this surgical technique.

Conclusion: The use of small animal models shows promise for immunological studies, while the use of large models shows importance for the development and improvement of surgical techniques in face transplantation.

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Exploring the Role of Caregivers in Day Surgery for Patients Undergoing Plastic and Reconstructive Surgery: A Comprehensive Patient and Caregiver Survey Approach

Presenter: Federica Casamassima
Co-Authors: Flaminia Biondi, GUGLIELMO TELLAN, Francesca Romana Grippaudo, MD, PhD

The study investigates the interplay between 42 patients who underwent Plastic and Reconstructive Surgery in the Day Surgery Unit of Policlinico Umberto I (Rome, Italy) and their respective caregivers. Utilizing a dual survey approach, we explored the role in patient's safety and the challenges faced by caregivers during the perioperative period. The study, conducted at Policlinico Umberto I, covers all surgical procedures from October to December 2023, encompassing skin cancer removal, fat grafting, scar revisions, hand surgeries, and eyelid surgeries. Patient demographics reflect varying

age distributions: 18-39 (4.9%), 40-59 (31.7%), 60-75 (34.1%), and over 76 (29.3%). Our study underscores the crucial role of informal caregivers in the plastic and reconstructive DS units, ensuring patient safety and avoiding inadequate hospitalization. In the face of an aging population and growing healthcare demand, these caregivers emerge as vital supporters during the perioperative period. Our findings highlight the significance of familial support in creating a positive postoperative experience. Importantly, the study also reveals a lack of caregiver burden, showcasing their seamless integration into this specialized unit, especially when given clear medical instructions. The positive correlation between patient ratings and caregiver influence emphasizes the pivotal role of informal caregivers in shaping patient' safety perceptions. In conclusion, our study empowers caregivers, positioning them as effective contributors to patient care.

Extended earlobe transposition flap

Presenter: Gustavo Moreira Costa de Souza, MD
Co-Authors: Felipe Romano Gonçalves Carvalho, Haylla Haramoto

Introduction: The ear and earlobe are frequently exposed to trauma and skin tumors. There are few options available for treating central defects of the auricular concha, antitragus, external auditory meatus, and external auditory canal. Healing by secondary intention and layered skin grafting are among the reconstruction options. Flaps from the retroauricular mastoid region are the most commonly used and perhaps the only flaps that can best reach this area.
The objective of this work is to present the application of a novel flap derived from the earlobe for the reconstruction of the central region of the middle 1/3 of the ear (from the external auditory canal, external acoustic meatus, antitragus, auricular concha to the antihelix).

Method: Prospective descriptive work based on a series of cases of central defects of the middle 1/3 of the ear using the extended earlobe transposition flap. Results: There have been 5 cases operated on so far, all for the treatment of basal cell carcinoma. The flap survived in all cases with immediate resolution of the defects created after tumor resection.

Discussion: There are few options for flap reconstruction of the central region of the ear. A local flap from the middle 1/3 or upper 1/3 of the ear does not exist, and a local flap from the lower 1/3 (earlobe) has not yet been described for this purpose.
The only earlobe flaps described are for posterior rotation for defects on the lateral side of the middle ear third or for anterior rotation for antitragus reconstruction.
Flaps from the retroauricular mastoid region require two surgical stages and create scars in the donor area while not reaching the external auditory meatus and external auditory canal.
The extended earlobe flap proved effective in covering extensive defects and even

reaching deep into the external auditory canal. It showed itself to be quite versatile with both anterior pedicle (cases 1, 2, 3, and 4) and posterior pedicle (case 5). Another advantage is minimal morbidity in the donor area, following the principles of aesthetic surgery for earlobe "rejuvenation."

Conclusion: This work describes a new local flap for reconstructing the anterior central region of the ear and auditory canal. The extended earlobe flap proved to be safe, versatile, and reproducible in resolving the cases presented.

Facial and Neck Reconstruction with an easy, fast and less morbid tool: Supraclavicular Artery Island Flap.

Presenter: David Serrano, MD
Co-Author: Victor Gonzalez, MD

The supraclavicular artery flap was described by Pallua for use in reconstruction in cases of cervical contracture in 1997 (1). Subsequently, DiBeneddeto and collaborators demonstrated the use of this flap in the reconstruction of facial and chest wall defects (2,3). Its use for neck and face reconstruction is because the color and texture of its skin matches with the color and texture of the skin of the receiving areas of the head and neck. (1) The arterial supply of this flap is given by the supraclavicular artery. An anatomical dissection study (n=55) reports that this artery has a length of 1-7 cm and a diameter of 1.1-1.5 mm. (4)

CASE REPORT: This is a 66-year-old male patient, with the presence of a melanoma tumor in the right preauricular region, which measures 10x7x8cm. At surgery, the head and neck surgery team did the resection of the tumor including the right preauricular region, and lower middle right region of the neck. For the reconstruction an ipsilateral supraclavicular artery flap was performed whose dimensions were 20 cm long and 7 cm wide, which after its transposition it was possible to cover the entire defect without complications and in the same surgical time. 6 weeks later the patient received adjuvant radiotherapy without complications related to the flap or wounds.

DISCUSSION: Advances in knowledge of the physiology and anatomy of skin vascularivascularity have allowed important advances in techniques and refinements for dissecting and elevating flaps, making previously neglected flaps more reliable and applicable. (5) The supraclavicular skin island flap was used to recover the skin coverage and the volume defect resulting from the resection of an advanced malignant tumor located on the face without using a free flap for reconstruction. The supraclavicular artery flap is a good tool to treat defects in the lower portion of the face. (5) CONCLUSION: The supraclavicular flap should be considered as a workhorse in reconstructive surgery of the face because it offers significant advantages in terms of easier surgical technique, shorter operating time, and lower cost for the patient

compared to a microsurgical free flap procedure, and offers similar results, versatility and less morbidity.

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FACIAL SUSPENSION AND RECONSTRUCTION OF THE NASOLABIAL FOLD WITH THE USE OF LOCAL DERMAL-FAT FLAP

Presenter: Nicolle Victoria Costa De Andrade, MD
Co-Authors: Rafael Araujo, Camila Valério Ferraz, Flavia Waisberg, An Ching, MD, PhD, Lydia Ferreira, MD, PhD

Introduction: Facial nerve paralysis causes functional, cosmetic, and social dysfunctions. Patients experience changes in oral competence, eye protection, and verbal transmission capacity, impacting their relationships and social interactions (1). The affected side typically exhibits fewer wrinkles, drooping of the lip and eyebrow corners, and a less pronounced nasolabial fold (NLF) (2). Even after rehabilitation, asymmetry may persist in the labial commissure if the NLF is not reconstructed (3).

Several techniques have been developed to address the appearance and functional limitations of patients with permanent sequelae of facial nerve palsy. These include static treatment techniques, such as plication of the Musculo-Aponeurotic System (SMAS) and facial suspension with autogenous or allogeneic materials, as well as dynamic resuscitation techniques, such as cross-face nerve grafting with microsurgical gracilis flaps (4). In contrast, the proposed technique is simple, reproducible, and can be performed in an outpatient setting.

Objective: To detail a surgical technique for restoring the nasolabial fold in patients with chronic facial nerve paralysis.

Methods: This series of cases describes a new technique approved by the Ethics and Research Committee of the Federal University of São Paulo. It was performed on patients aged between 40 and 80 years old, with chronic facial paralysis who were not candidates for dynamic rehabilitation and had erasure of the NLF. The technique involved surgical marking based on NLF measurement, followed by local anesthesia and surgical procedures including de-epidermization and fixation of the NLF using a Casagrande needle. Evaluation criteria included photographic records and improvement in ipsilateral nostril breathing six months post-surgery.

Results: Four procedures were conducted without complications, resulting in improved facial symmetry, NLF restoration, elevation of the lip commissure, and correction of nasal deviation.

Discussion: The proposed technique offers simplicity, being performed under local anesthesia without the need for additional tissues or synthetic materials. It achieves discreet elevation of the nasal wing and improves aesthetics and respiratory function. While it is a simple technique with low morbidity, possible complications are lower than those associated with widely used complex techniques. However, other procedures may need to be combined to achieve symmetry and treat facial paralysis, such as fat grafting or rhytidoplasty.

Conclusion: The described static treatment technique provides a simple outpatient solution for restoring the NLF in chronic facial nerve paralysis.

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Feasibility Trial of Autologous Quality- and Quantity-Cultured Peripheral Blood Mononuclear Cell Therapy for Chronic Limb-threatening Ischemia and the Elucidation of its Underlying Mechanism.

Presenter: Sen Jiang
Co-Authors: Miki Fujii MD, PhD, Yuki Morishige, Hiroshi Mizuno, MD, Rica Tanaka, MD

Background: We have previously established a novel type of cells named MNC-QQ cells which is from a serum free quantity and quality control culture (QQc) of peripheral blood mononuclear cells (MNCs) that increases the vasculogenic and tissue regeneration ability of MNCs. In our clinical study, we have showed that MNC-QQ cells accelerate vasculogenesis and wound healing in patients with ischemic non-healing extremity wound. However, it has also shown that angiographic restenosis and wound recurrence were found in some cases 1-year post single administration of MNC-QQ cells. Therefore, in this study we conducted a feasibility trial of MNC-QQ cells therapy by multiple administrations for chronic limb-threatening ischemia (CLTI) to evaluate its safety and efficacy. We have previously proven vasculogenic potential of MNC-QQ cells, however, the roles of MNC-QQ cells in diabetic condition wound healing is not elucidated. Here in, we will report the result of the clinical trial and analyzing the underlying mechanism of MNC-QQ cells in diabetic wound healing.

Methods: Patients with non-healing extremity wound were prospectively enrolled in the study. Peripheral blood (100 mL) was collected from all participants to isolate MNCs for MNC-QQ cell preparation for 7 days. MNC-QQ cells were intramuscularly injected at foot and posterior of calf. The procedure was repeatedly conducted every 4 weeks for multiple administrations. After receiving the treatment, patients visited the clinic for safety and efficacy evaluations by percent of wound closure, SPP, TcPO2 and ABI, pain assessment, amputation-free survival and wound recurrence and restenosis. Meanwhile, in vitro studies were conducted to elucidate the mechanism of MNC-QQ cells. First fibroblasts were cultured under normal glucose (NG, 5.5mM glucose) or HG (25mM glucose) conditions. Wound-healing assay was then carried out by co-culturing fibroblasts with/without MNC-QQ cells. After scratching the fibroblast-monolayers, the wound closure was measured for 24hrs to assess the fibroblasts migration.

Results: In our clinical trial, no deaths occurred, and no life-threatening adverse events were observed during the follow-up period. Complete wound closure occurred in all patients (4/4) after an average duration of 84.75 days. Significant improvements of SPP and TcPO2 were observed at 16 weeks. All patients claimed that pain began to decrease after treatment. Furthermore, none of the patients showed wound recurrence and restenosis within 1 year post therapy. From in vitro studies, it was showed that the migration of fibroblasts co-cultured with MNC-QQ cells was significantly promoted compared to those without a coculture not only under NG (38.1 ± 10.2% vs. 53.7% ± 9.0%/24h; $p < 0.01$) but also HG conditions (22.6 ± 6.9% vs. 48.7 ± 8.0%/24h; $p < 0.005$).

Conclusion: Our results suggest that MNC-QQ cells are safe, minimally invasive, and effective as a therapy for patients with CLTI. Larger clinical studies that include proper control groups are needed to establish the safety and efficacy of the procedure. Additionally, MNC-QQ cells may accelerate wound healing not only by vascular

regeneration by also via improving the diabetic fibroblasts migration. Further mechanism will be elucidated in the future.

Free Vascularized Lymph Node Transfer Using Contralateral DIEA in Postoperative Intractable Lymphedema due to Leiomyosarcoma of Lower Extremity: A Case Report

Presenter: Jimin Lee, MD
Co-Author: Sang Yoon Kang MD

Purpose: The vascular pedicle was essential for the microvascular surgery or the free flap. The patient got lower extremity lymphedema after radical excision of recurred leiomyosarcoma of the thigh. The patient had poor vascular condition for the reconstruction. We present a reconstruction case of the soft tissue defect and intractable lymphedema with leakage under poor vascular conditions using a contralateral complex vascular manipulation and free flap..

Method: A 57-year old female was referred from the orthopedic surgery department for delayed wound healing and persistent, excessive amount of serous drainage (>350cc/day) from the left extremity. The patient had undergone en bloc excision on the left inguinal area and iliofemoral interposition with expanded-polytetrafluoroethylene graft for recurred leiomyosarcoma of the gracilis muscle. Preoperative CT findings showed ligated external iliac and femoral veins; lymphangiography showed no activity of ilioinguinal lymph nodes, disturbance of the main lymphatics, and dermal backflow of the left thigh.

Result: We first performed LVA at three sites below the knee. One month later, we performed vascularized lymph node transfer (VLNT) by contralateral deep inferior epigastric artery(DIEA) transposition for pedicle formation, then microvascular transplantation of functional lymph nodes using right side SCIP free flap. SCIP free flap with deep fat lymph nodes was anastomosed to Y-shaped DIE artery and vein terminal using SIEAV graft; medial branch of femoral artery and vein was anastomosed to DIEP. Lymphangiography taken one month postoperatively showed decreased dermal backflow of the affected thigh. The patient also expressed subjective improvement.

Conclusion: Our case shows that in lower extremity lymphedema post-radical tumor resection with poor vascularity, VLNT using a combination of pedicle formation with contralateral DIEP vessels and superficial inguinal lymph node free flaps can be considered.

Functional chest wall reconstruction using dynamic prosthesis. Is 3D printing technology our new allied?

Presenter: María Segovia González, MD
Co-Authors: Manuel Vegas, MD, PhD, Gemma María Muñoz Molina, Nicolás Moreno Mata, Pablo Benito Duque, MD

INTRODUCTION AND PURPOSE: Chest wall resection and reconstruction represents an oncologic, structural and functional challenges (1, 2). The reconstruction must restore skeletal stability to protect vital structures, preserve respiratory function, restore anatomical cavities and upper extremities support (1-4). Therefore, the ultimate goal is to achieve the relative stability inherent in a dynamic chest wall while preventing an unstable thorax. Thus, semi-rigid fixation methods are superior to rigid fixation methods that do not allow physiological movement of the chest wall (3).

The objective of this work is to present our experience in chest wall reconstruction using customized 3D-printed dynamic prosthesis, with the aim of restoring protection, function and elasticity to the thorax.

METHODS: Between September 2022 and May 2023, five patients with a primary or metastatic chest wall tumor underwent resection and reconstruction surgery in our Hospital.
In all cases, immediate composed reconstruction was performed using a biological mesh, a customized titanium 3D-printed dynamic prosthesis, and a pedicled or free flap for coverage.
The average follow-up time was 8 months.

RESULTS: There were no postoperative adverse events.

Despite the extensive resection of the sternum and/or ribs, no patient presented paradoxical chest wall movements postoperatively or during follow-up.
All patients presented a restrictive pattern in the pulmonary function tests. However, it was well managed with physiotherapy and resulted in adequate respiratory function. Stable coverage, protection of the structures and an adequate chest wall contour were also achieved.

CONCLUSIONS: The goals of successful chest wall reconstruction include protecting the intrathoracic organs, restoring chest wall stability and thus preserving respiratory function (1-5).
Preoperative planning and 3D printing technology make it possible to design the exact dimensions of the implant, adapting it to the defect in each case (4).
Compared to classic reconstruction methods, the dynamic prosthesis provides semi-rigid fixation with its three-dimensional 'Greek wave' design. This design allows for the recreation of chest wall compliance while restoring skeletal stability, protecting the structures and maintaining the shape (2).

The use of a biological mesh allows for the separation of the lungs and other structures from the implant and helps seal the pleural cavity (2, 3).
Additionally, it is essential to provide high-quality and stable coverage by using flaps to

protect the bioprosthetic materials and reduce medium to long-term complications (3, 4).

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Generating Evidence in Plastic Surgery using Wearable Technology: a Series of Cohort studies

Presenter: Richard Kwasnicki, MD, PhD
Co-Authors: Daniel Leff, Simon Wood, MB, BS, Shehan Hettiaratchy

Aims: We present a series of data in breast reconstruction, abdominoplasty and lower-limb trauma showing how technology such as wearable activity monitors (WAMs) is starting to provide the next generation of evidence to drive advances in clinical practice.

Methodology: Between 2014-2024 a series of plastic surgery cohort studies involving over 200 patients were conducted using WAMs to assess post-operative recovery. Following validation of the outcome measure, longitudinal data were analysed against patient and surgical factors to delineate their impact on post-operative morbidity.

Results: Patients undergoing implant-based breast reconstruction showed no difference in recovery compared to mastectomy only ($p=0.19$).[1] Both groups were more active than patients having autologous reconstruction immediately post-op (71% vs 50% baseline, $p<0.001$) but after 6-months there was no difference in functional outcomes. Of those having concomitant axillary surgery, patients were 20% more active after sentinel lymph node biopsy compared to clearance ($p=0.015$).[2] Abdominoplasty patients reduced their activity by 70% post-op, returning to 16% above baseline at 6-months ($p=0.046$). Those with a BMI >30 had a significantly slower recovery. After lower-limb reconstruction, those with Gustilo Anderson fractures class 1, 2 and 3, appeared to recover at 3, 6 and 9-months respectively. [3]

Conclusions: In an era of so many treatment options, it is paramount that we use the best outcome measures possible to evaluate what treatments to use and in which patients. Future use of activity data from smartphones has the potential for rapid scalability of these studies and introducing interventions in a move towards technology-enhanced recovery after surgery.

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Gluteal Fold Perforator Flap in Perineal Reconstruction of a Post-excisional Defect in an Invasive Vulval Carcinoma

Presenter: Patricia Alina Cepi
Co-Authors: Ruxandra Sinescu, MD, PhD, Stefania Riza, MD, ANDREI POROSNICU

BACKGROUND: Vulval cancer is a disease affecting predominantly elderly women. Squamous cell carcinoma is the most common type and is usually diagnosed at ages 65 to 74. Risk factors include increasing age, HPV infection, smoking, inflammatory conditions of the vulva, prior pelvic radiation, and immunodeficiency. Diagnosis is usually made through tissue biopsy, with surgical excision being the main treatment approach. This case report aims to illustrate a complex reconstruction of a perineal defect resulting from the excision of a vulval neoplasm using a gluteal fold perforator flap.

CASE PRESENTATION: We present the case of a 58-year-old female patient admitted for perineal reconstruction following the removal of a vulval neoplasm, which was also treated with chemotherapy and radiotherapy. The patient's medical history included a total hysterectomy with bilateral oophorectomy for a uterine fibroid in 2010. She underwent surgery in 2018 for a perineal tumor mass, which was confirmed to be squamous carcinoma. In 2019, she experienced a recurrence of a peritoneal interrectovaginal tumor, leading to an en bloc resection of the growth, posterior colpectomy, and removal of the right anal levator muscle, followed by creation of a left lateral colostomy. Subsequently, she underwent ongoing chemotherapy until 2021. In

January 2022, she had another perineal recurrence with anal canal invasion which was treated by viscerolysis, rectal amputation colostoma removal. In February 2023 she presented to our department with a plague dehiscence measuring 10x10x5cm. We perfomed a full body CT scan in order to identify possible secondary determinations but no lessions were found. A wound secretion was collected which revealed infection with Enterococcus faecalis. We performed abundant lavage, degranulation, and negative wound pressure dressing and initiated antibiotherapy a week before surgery. Degranulation of the defect and resection of skin margins were followed by reconstruction using a gluteal fold fasciocutaneous flap harvested from the right gluteal fold, after identifying multiple perforating vessels with Doppler. The remaining pivot point included ample subcutaneous tissue and arterial vasculature, the integrity of which was reaffirmed with intraoperative Doppler ultrasound. The flap was transposed to fill the defect, utilizing the distal third of the desepithelialized flap. The flap was secured with padding sutures and tegumentary suture under suction drainage after thorough lavage and rigorous hemostasis. The postoperative course showed positive progress, with a viable flap, normal capillary pulse, and no signs of local or systemic infection. The wound was completely healed at 1 month follow-up.

The use of the gluteal fold perforator flap in perineal reconstruction following the excision of an invasive vulval carcinoma presents a promising solution for addressing postexcisional defects in this particular clinical context. This surgical approach not only offers a method for structural repair but also holds potential for enhancing patient outcomes in terms of functional and aesthetic restoration.

CONCLUSION: The use of the gluteal fold perforator flap in perineal reconstruction following the excision of an invasive vulval carcinoma presents a promising solution for addressing postexcisional defects in this particular clinical context. This surgical approach not only offers a method for structural repair but also holds potential for enhancing patient outcomes in terms of functional and aesthetic restoration.

KEYWORDS: vulval squamous cell carcinoma, gluteal fold perforated flap, perineal reconstruction.

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Impact of SARS-CoV-2 pandemic on diagnosis and management of non-melanoma skin cancers: the popcorn effect

Presenter: Giulia Tringale, MD
Co-Authors: Giuseppe Nisi, MD, Luca Grimaldi, MD

The SARS-Cov2 disease enormously affected daily life and radically changed the clinical and surgical routines. The difficulty or the impossibility, especially for elderly patients, to access healthcare facilities and the fear of getting infected within hospitals, have led to the postponement of treatments normally considered essential. Everything that had a strong impact on the treatment of skin cancers, starting from an adequate and early diagnosis up to the actual surgical treatment, has been limited and delayed (1)(2).

A retrospective observational study was conducted on all patients undergoing radical surgical removal of non-melanoma skin tumors at the U.O.C. of Plastic Surgery of the Siena University Hospital from January 2019 to December 2022. Using the Sapweb company software, the histological reports of the 444 patients operated in the four-year period 2019-2022 were examined.

The main goal of the study was to verify whether there was an increase in size of squamous cell and basal cell carcinomas due to the diagnostic and therapeutic delay caused by the SARS-Cov2 pandemic.

In 2019, the average surface area of the 65 basal cell carcinomas removed was 0.82 cm2; in 2020, in the 71 patients operated, the average surface area was 0.85 cm2; in 2021, the 66 patients operated had an average skin lesion extension of 1.42 cm2, while in 2022, at the end of the health emergency, the average surface area was 0.93 cm2.

The 33 squamous cell carcinomas removed in 2019 had an average surface area of 2.91 cm2. In 2020 the size increased by 15.82% with an average extension of 3.37 cm2, calculated on a total of 39 patients undergoing surgery. In 2021, with measurements carried out on tumors removed from 41 subjects, the average surface area was 2.87 cm2, while in 2022 the average surface area was 2.31 cm^2.

The drastic measures adopted to limit SARS-Cov2 pandemic have had a strong impact on all hospital activities. Surgical activity was almost interrupted during the lockdown months and, in the following months, often significantly reduced. One side effect of this situation has been a conspicuous delay in diagnosis and surgical treatment of non-melanoma skin tumors. In our clinical experience this has translated into a modification

in the presentation of these neoformations. For what concerns basal cell carcinomas, there was an increase in size of 74.23%. Paradoxically, however, a reduction in size of squamous cell carcinomas has emerged, which should be read critically on account of all those patients who have left the therapeutic path because they are no longer operable.

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In vivo regeneration of hair-bearing skin through reprogramming of mesenchymal cells

Presenter: Yuta Moriwaki, MD
Co-Authors: Motoi Kato, MD, Koji Kanayama, Mutsumi Okazaki, MD, PhD, Professor Masakazu Kurita, MD

Purpose: Mammalian skin appendages, such as hair follicles and sweat glands, are complex mini organs formed during skin development1). However, scar tissue resulting from wound healing lacks these appendages, presenting a clinical challenge in skin regeneration2). We have developed a method to generate skin epithelial tissues through in vivo reprogramming of wound-resident mesenchymal cells using four transcription factors: DNp63A, GRHL2, TFAP2A, and cMYC. This process yields cells capable of forming stratified epithelia, which we term Induced Stratified Epithelium Progenitors (DGTM-iSEPs)3). Nevertheless, the regenerated skin lacked appendages. Considering that skin appendages form during development, we hypothesized that reprogramming adult mesenchymal cells to epithelial and mesenchymal cells akin to those in developing skin could enable in situ skin appendage generation.

Methods and Materials: We employed a traditional skin reconstitution assay as the functional test to identify a set of reprogramming genes capable of regenerating skin appendages4). This assay involved transplanting a mixture of skin-derived epithelial cells (SECs) and subcutaneous mesenchymal cells (SMCs) into a silicone chamber attached to a skin ulcer on immunodeficient mice. We tested eligible genes by measuring dermal papilla markers (PROM1, CRABP1, VCAN) and alkaline phosphatase (ALP) expression following the transduction of each gene individually and in combination, using retroviruses.

Results: Our initial goal was to identify genes that reprogram adult SECs into epithelial cells capable of reconstituting skin appendages alongside neonatal SMCs. Through the skin reconstitution assay, we found that DGTM+LEF1-induced stratified epithelium

progenitors (DGTML-iSEPs) could regenerate skin appendages with neonatal SMCs. We also explored the gene combinations required to reprogram adult SMCs into mesenchymal cells with the potential for skin appendage regeneration. Co-transplanting FOXD1+PRDM1-transduced subcutaneous mesenchymal cells (FP-SMCs) and LEF1+SHH-transduced subcutaneous mesenchymal cells (LS-SMCs) with DGTML-iSEPs resulted in the formation of mature hair shafts, hair follicles, and sebaceous gland-like structures. GFP-labeled adult SMCs used in generating DGTML-iSEPs, FP-SMCs, and LS-SMCs, when co-transplanted with unlabeled cells, demonstrated that these cell types were integral to regenerated skin appendages.

Conclusions: Our study demonstrates that transplanting a specific type of epithelial cell and two types of mesenchymal cells, all reprogrammed from adult mouse subcutaneous mesenchymal cells to resemble developing skin cells, can lead to the formation of skin-appendage-like structures. These findings could open new avenues for treating skin regeneration issues and common aging-associated skin appendage disorders, such as hair loss and dry skin. This approach also holds potential for the de novo generation of complex organs in vivo.

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Intramedullary Cannulated Headless Screws as a Method of Osteosynthesis in Digital Reimplantation

Presenter: Eduardo Vallejo-Aparicio

Objective: Osteosynthesis is the initial and one of the most crucial steps in the process of replantation, essential for ensuring favorable functional outcomes (1). Kirschner wires represent the most widely adopted method; however, they fall short in achieving optimal compression of fragments (2). Plate and screw systems present an alternative, albeit a slower one, with potential issues related to tendon adherence (3). The primary objective of this study is to elucidate the osteosynthesis technique employed in digital reimplantations, with a specific focus on the utilization of intramedullary cannulated screws. The aim is to assess the outcomes of this method in a national reimplantation reference center.

Materials and Methods: Prospective data were collected from 20 patients who underwent digital reimplantations with osteosynthesis using intramedullary cannulated screws. The procedure involved anterograde insertion of a Kirschner wire through the fragment, followed by retrograde alignment and advancement of the needle (back-and-forth technique). Subsequently, a self-tapping intramedullary screw was inserted (4). The spinal canal measurement was crucial to avoid placing a screw that is too large, which could lead to bone fracture. Commonly used screw sizes were 2.5mm and 3.5mm. The screw length aimed to maximize stability. Evaluation included intervention success, complications such as infection or necrosis, and nonunion occurrence during a 1-year follow-up.

Results: Among the 20 patients, the mean age was 46 years, predominantly males (95%), smokers (60%), and with work-related accidents (70%). Injuries were mostly contusive (95%) and avulsive (5%). Reimplantations mainly involved long fingers (80%) and thumbs (20%), with 10% being multidigital. In 10% of cases, the intramedullary screw was used for joint-level amputation arthrodesis. Notably, there were no instances of infection, and only one case experienced reimplantation loss due to venous congestion. Nonunion was absent during the follow-up period. Rehabilitation commenced after 2 weeks, in contrast to the usual 3 weeks with other osteosynthesis techniques.

Conclusion: The described technique offers several merits. It demonstrates expeditiousness, particularly attributed to the simplified step of guiding the needle through the medullary canal during intramedullary screw osteosynthesis(5). Furthermore, the method facilitates optimal compression between fragments, diminishing the likelihood of malunion and pseudoarthrosis. Effective control over malrotation is achievable, and the procedure exhibits a low infection rate, allowing for early initiation of rehabilitation.

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Late migration of copolyamide gel filler for breast augmention

Presenter: Xin Nee Ho MBBS Bsc
Co-Author: Hui Wen Ng

Aqualift is a copolyamide gel filler first used in the Czech Republic for facial contouring, subsequently for breast augmentation. However there have been safety concerns over copolyamide fillers after multiple reports of mastalgia, mastitis, gel migration, inflammation, infection, and nodule formation (1). We discuss a patient who presented with a late complication of Aqualift gel injection for breast augmentation. A 45-year-old lady with a history of subpectoral breast filler injection with Aqualift 14 years prior presented with left sided breast tenderness, fluctuance with superior fullness and increase in size over 6 months. She suffered from hyperaesthesia over her left medial upper arm, limitation of movement of her arm and elbow flexion. MRI showed filler migration into her axilla, tracking down her arm along the neurovascular bundle. She underwent removal of the migrated filler via inframammary crease, axilla and medial arm incisions. Filler material was seen dissecting into her left pectoralis major muscle, extending to the subclavicular region, axilla, and triceps muscle. Intraoperative cultures grew cutibacterium and histology was negative. Her symptoms resolved postoperatively, and she regained full range of movement of her elbow and arm. Injectable fillers for breast augmentation were once a popular aesthetic procedure, offering a minimally invasive procedure with instant results. The long-term sequelae that are still seen serve as a reminder of why breast filler injection has since fallen out of favour and is widely prohibited in most countries.

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Long-term Volumetric Stability of Diced ADM in Oncoplastic Breast Surgery

Presenter: Jeong Jin Park, MD
Co-Authors: Yoonsoo Kim, MD, Hyung Suk Yi, MD, Hong Il Kim, MD, PhD, Yoonsoo KIM, Jin Hyung Park, MD, PhD

Purpose: Oncoplastic breast-conserving surgery (BCS) is a safe and effective method for minimizing volume defects after partial mastectomy and maintaining breast shape [1]. The safety of using ADM in breast reconstruction has also been demonstrated and it is possible to achieve a natural breast contour without the deformity of bulging or depression [2]. But changes in ADM volume at long term follow-up have not been yet reported. The aim of this study is to report on volumetric changes of diced ADM used as a volume replacement in oncoplastic BCS after long-term follow up.

Methods: We retrospectively analyzed 51 patients who underwent BCS with diced ADM for defect repair from February 2021 to February 2022 (Table 1). Two types of ADM, Sheet type CGCryoderm®(CGBio, Seoul, Korea) and Diced-MegaDerm®(L&C Bio, Seoul, Korea), were used based on the weight of resected tissue (Fig. 1). To evaluate ADM volumetric changes, breast MRI follow-ups were conducted at 6 and 12 months after surgery. Quantitative analysis of volume measurement was conducted using diameter - based and Region of interest - based methods. The patient's baseline characteristics and operative data were analyzed. Satisfaction and aesthetic outcomes were assessed using the BREAST-Q survey and Validated Breast Aesthetic Scale.

Results: Preliminary results indicate successful defect replacement with diced ADM, with initial volumetric stability observed. Follow-up MRI assessments provided detailed insights into the volumetric changes over time. A total of 51 patients were enrolled in this study. The average volume of ADM used was 28.2cm³. Based on the diameter median volume, compared to ADM volume after 6 months, there was a decrease in ADM volume after 12 months from 28.91 ± 10.96 cm³ to 26.92 ± 10.30 cm³, with no statistical significance (Table 2, Fig. 2). ROI based volume also showed a decrease, from 29.04 ± 10.73 cm³ to 27.95 ± 10.29 cm³. Seroma (2.0%), depression (11.8%), hematoma (2.0%) was observed but none of the complications were statistically significant. In aesthetic outcomes, mean BREAST-Q scores were 84.0 in the patient's group, and the mean aesthetic item scale was 4.7 (±0.6) in the surgeon group.

Conclusion: Over a one-year period, the volumetric decrease in ADM used for oncoplastic BCS was observed to be 6.9% when measured by diameter and 3.7% by ROI analysis, with neither method showing statistically significant changes. This minimal volumetric reduction suggests that ADM maintains its volume effectively over time, leading to stable cosmetic outcomes without significant depression or shape alteration. Consequently, our findings affirm that oncoplastic BCS employing ADM for volume replacement not only ensures the safety of the procedure but also achieves aesthetically satisfying results, supporting its continued use in breast reconstruction.

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Longitudinal analysis of three-dimensional cranial growth after fronto-orbital advancement in coronal craniosynostosis

Presenter: Byung-Jun Kim, MD
Co-Author: Sungmi Jeon, MD, PhD

Objective: To investigate longitudinal changes of three-dimensional (3D) cranial growth following fronto-orbital advancement (FOA) surgery in patients with coronal craniosynostosis.

Methods: A retrospective review analyzed head circumference (HC) and computed tomography (CT) data during preoperative (T0), postoperative (T1), and long-term follow-up (T2) visits from 40 patients (female 22, male 18) who underwent FOA between 1987 and 2018. The z-scores of HC and CT-based intracranial volume (ICV), anteroposterior diameter (APD), biparietal diameter (BPD), and cranial height (CH), were calculated using sex and age-specific standards. Logistic regression explored factors (e.g., age at surgery, distraction osteogenesis (DO)) influencing cranial parameters.

Results: While z-scores of HC, ICV, and BPD remained within the normal range, APD z-scores fluctuated between -2 and -1, and CH z-scores exceeded 2 compared to norms from T0 to T2. At T2, age at surgery significantly influenced the z-scores of HC, BPD, and CH (all $p<0.05$). For long-term stability from T1 to T2, later surgical age correlated with increased z-scores for BPD and CH ($p = 0.007$ and 0.019, respectively). DO for FOA was associated with (1) elevated HC z-scores at T2, and (2) increased APD from T0 to T1, followed by significant APD relapse from T1 to T2.

Conclusions: Our findings suggest delaying FOA for optimal cranial growth unless immediate relief of increased intracranial pressure is necessary. DO provides greater immediate APD expansion, leading to increased HC in the long term. However, subsequent relapse might necessitate additional open FOA to overcorrect APD and reduce CH for optimal 3D cranial morphology.

Lymph Node Metastasis in Squamous Cell Carcinoma of the Lip.

Presenter: Caitlin O'Hare
Co-Authors: Richard Ross, MD, Robert Calvisi, MD, Pascalino Romeo, MD, Michael Wagels, Darryl Dunn

Background: Squamous cell carcinoma (SCC) is the second most common skin cancer in Australia. The lip is a high-risk site for lymph node metastasis given the ease of accessing the rich lymphatic system in the muscle beneath. It may be difficult to define the origin of lip tumours as either mucosal or cutaneous, which impacts on treatment with respect to the nodal basin. The most important prognostic factor for overall survival is lymph node metastasis – which can reduce five-year survival by half. The primary aim of the study was to identify factors associated with lymph node metastasis. Recurrence and overall survival were analysed as secondary outcomes.

This was performed to identify which patients were high risk and attempt to highlight who would benefit from elective treatment of the nodal basin.

Methods: A retrospective analysis of all lip resections performed over two tertiary hospitals over a five-year period was performed. Data on known risk factors was collected and analysed using univariate and multivariate analyses, as well as cox-proportional hazard modelling.

Results: A total of 290 lip resections were included in the study. 25 patients (25/290, 8.6%) had lymph node involvement at any point in time. Significant risk factors for lymph node metastases were size, depth of invasion and muscle invasion. Recurrence was associated with size, depth of invasion and differentiation grade. Overall survival was significantly reduced by increasing age, immunosuppression and nodal involvement at presentation.

Conclusion: This research is one of the largest studies involving lip SCC and lymph node metastases. Significant factors for each of the outcomes were consistent with previous studies, however there were some differences. It provides a baseline dataset for comparison to establish elective treatment of the nodal basin in high-risk patients with lip SCC.

Management of various cases with head and neck defects

Presenter: Alma-Andreea Corpodean, MD

Introduction: Reconstruction of head and neck defects continues to be a major challenge for plastic surgeons. Defects of any size can have dramatic effects on physical cosmesis, speech, respiration, and nutrition, which can greatly affect the patient's quality of life. Where possible, tissue defects are replaced with similar tissue, although donor sites may be local, regional, or distant. A particular feature of the head and neck region is that in tumor excisions the margins cannot be resected without significantly affecting vital neighboring structures, sometimes implying the need of a multidisciplinary team. There are multiple methods for head and neck reconstructions varying from simple skin grafts to free vascularized tissue transfer. An important factor to take in consideration is that the choice of treatment depends greatly on the general state of the patient. In these case series, we will show the importance of choosing the best treatment plan depending on the patient general state.

Case report: We present a series of cases with head and neck defects for which the methods of reconstruction choosed vary from loco-regional to free flaps.

Discussions: The anatomical region of head and neck is of great complexity and surgery can have a major impact on the quality of life of the patient, associated with all the functional roles attributed to this region-speech, chewing, swallowing, breathing as

well as social reintegration, as the face represents the projection of one's identity in the society. Currently, free flap reconstruction techniques have been accepted worldwide as the 'gold standard' for the reconstruction of wide, complex head and neck defects. However there are cases in which the patiens have other severe comorbidities which will not allow the possibility of lengthly, complex and high-risk surgery and will impose the choice of a simple and efficient surgery with minimal lenght and risks for the patient.

Conclusions: Head and neck reconstruction are quite challenging and the choice of treatment depends on various factors including the general state of the patient and skills of the surgical team.

Minimum skin incision extended endoscopic LD flap for breast reconstruction using a two-step port penetration technique and a tip movable endoscope

Presenter: Shinsuke Akita, MD, PhD
Co-Author Nobuyuki Mitsukawa, MD, PhD

Background: Endoscopic extended Latissimus Dorsi (eeLD) flaps contribute greatly to less scar autologous breast reconstruction1. In eeLD flap, large subcutaneous fat and LD muscle nourished by the thoracodorsal artery can be elevated via the mastectomy wound and two holes for the ports. Meanwhile, in recent years, mastectomy has also become feasible with smaller scars. With the conventional eeLD flap technique, additional skin incisions were occasionally required. We developed novel techniques to minimize the skin incision in the eeLD flap by using the two-step port penetration technique and a tip movable endoscope.

Method: From the wound of the mastectomy to the first port was penetrated under direct vision and the first port was inserted. A tip movable endoscopic camera was inserted through the wound of the mastectomy to secure the field of view, and a monopolar electric scalpel was inserted through the first port and subcutaneously dissected to the insertion position of the caudal port. Once the caudal port was inserted, the wound was closed, carbon dioxide was inflated, and the whole adipose-muscle flap was elevated.

Results: In 15 patients, eeLD flap elevation was performed using the two-step penetration technique and the tip movable endoscope. The entire LD muscle and surrounding adipose tissue could be elevated in all patients under short skin incision. None of the mastectomy wounds required additional incision. The operation could be completed with a shorter incision than conventional eeLD flap (Control group, n =15). With our new procedure, the proportion of cases requiring additional fat injection was reduced over the one-year follow-up period after surgery compared with the conventional method.

Discussion: Our novel techniques for eeLD flap contributed to achieve a shorter skin incision and a sufficient amount of vascularized tissue for reconstruction. Endoscopic surgery is less costly to implement than robotic surgery, but is equally effective. At present, endoscopic surgery is considered to have more advantages in elevating the extended latissimus dorsi plus adipose flap.

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Morphological Evaluation of the Outcomes of Lymphaticovenular Anastomosis Using Scanning Electron Microscopy in an Experimental Rat Model: the Ideal Anastomosis Style

Presenter: Satoshi Onoda, MD, PhD
Co-Author: Toshihiko Satake, MD

Purpose: Lymphaticovenular anastomosis (LVA) aims to prevent cellulitis and decrease the volume of the diseased limb; however, its effect often differs among individuals. We believe that the operative technique or anastomosis style is the most important factor contributing to this difference.1 We reviewed the details of the postoperative histological changes between patency and obstruction cases using optical and transmission electron microscopy in an LVA rat model.2 The results are reported in the Guest Nation Panel of the ASPS 2016.3 Presently, we conducted a morphological evaluation of the outcomes of LVA using scanning electron microscopy in an experimental rat model and described our findings.

Materials and Methods:

Animal model: The experimental rat model of LVA was created using lumbar lymph ducts and iliolumbar veins of six 350–500g male Wistar rats.2

Surgical technique: Open abdominal surgery was performed under general anesthesia to identify the veins and lymph ducts, which were carefully isolated. Ten end-to-end and 10 side-to-end style LVAs were performed.
Histological examinations.

One month postoperatively, we reoperated the abdomen and obtained a tissue from the anastomotic region, including the lymph duct and vein after confirming patency. We reviewed the details of the postoperative histological changes using scanning electron microscopy.

Results: All procedures were performed by a single operator that performed >500

clinical cases of microvascular anastomosis for free-flap transfer and LVA. The diameters of the lymph ducts and veins were 0.4–0.6 mm and 0.5–0.7 mm, respectively. The patency of end-to-end and side-to-end anastomoses were confirmed in nine patients and two patients, respectively. In the case of obstruction in side-to-end anastomosis, the lymphatic vessels with the anastomosis were strongly twisted. In the patency of an end-to-end anastomosis, the anastomotic region had a smooth transition from a lymphatic duct with a thin circumference to a vein with a large circumference. However, mild twisting was observed in the proximal part of the lymphatic duct wall, which was moderately from the anastomotic region. Twisting is believed to be caused by an external pressure on the anastomotic region.

Conclusion: Regarding the advantages of end-to-end anastomosis,4 the patency is easy to confirm and pressure from all lymphatic ducts is used to push the lymph fluid to the vein side, as compared with other anastomosis methods. Side-to-end5 and side-to-side anastomoses could preserve lymph flow to avoid disconnecting lymphatic vessel; however, the procedure can become complicated, and the traction power can easily affect the lymphatic wall. Side-to-end anastomosis was performed in our experimental rat model, but patency was obtained in only two cases at 1 month postoperatively. It is likely that an external force can easily affect the weakest anastomotic region. LVA was performed on both limbs. Therefore, LVA sites are associated with more postoperative body movements than those of conventional microsurgery, and it is believed that external pressure can affect the anastomotic regions. Here, the suture style that was more likely to achieve long-term patency in the LVA was end-to-end anastomosis.

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OUTCOMES OF BILATERAL UPPER AND LOWER BLEPHAROPLASTY: CORRECTIVE APPROACH TO A DISASTER

Presenter: Matilde Tettamanzi
Co-Authors: Corrado RUBINO, Emilio Trignano, MD

The correction of iatrogenic ectropion represents one of the most complex surgical challenges for the Plastic Surgeon. These complications compromise both the functionality and aesthetics of the periocular area, and corrective interventions aim to restore the functionality and anatomy of the region. The combination of multiple complications often requires the use of various surgical techniques to resolve the problem. We present the clinical case of a 46-year-old woman who came to our attention following bilateral upper and lower blepharoplasty, performed in a private facility by another professional approximately 6 months ago. She presented with third-degree ectropion and lagophthalmos of the left lower eyelid, and second-degree ectropion of the right lower eyelid. Surgical interventions to correct these problems often require skin and cartilage grafts, which often result in recurrences and suboptimal scarring outcomes. The patient expressed reluctance towards the adoption of skin and cartilage grafts taken from another site, so it was decided to opt for correction through midface lift, lateral canthoplasty, tarsal strip, and conjunctival excision. The three-month follow-up confirmed the success of the surgical procedure, allowing for the correction and restoration of eyelid functionality and aesthetics, avoiding sacrifices of third-party donor areas and with great patient satisfaction.

Outcomes of temporalis muscle based facial reanimation surgery: A systematic review and meta-analysis.

Presenter: Zhen Yu Wong
Co-Authors: Frank W. de Jongh, Koen J.A.O. Ingels, Niels van Heerbeek, Sjaak Pouwels

Aims: Despite encouraging findings of temporalis based facial reanimation surgery without the need for nerve grafting, there remains a need for a comprehensive evaluation of the impact of temporalis based facial reanimation surgery on key outcome measures.

Methods: Comprehensive search in MEDLINE and Embase databases were done up to 25th February 2023. The inclusion criteria for this study focused on articles that examined facial reanimation surgery utilising the temporalis muscle. Postoperative changes in smile excursion and angle of mouth while smiling were pooled using the DerSimonian and Laird random effects model. Narrative synthesis was conducted for other outcomes including assessments of spontaneous smile, subjective evaluation of facial symmetry using validated rating tools, functional outcomes, aesthetic outcomes, and patient-reported outcomes owing to heterogeneity in reporting of outcomes.

Results:24 studies were included in the analysis. Conflicting evidence was demonstrated regarding emotional smile outcomes and its definition. The pooled changes in smile excursion post-surgery was 7.06mm (95 CI 3.73-10.40, P<0.001; I2=

0%) and in angle of mouth while was 11.76 degree (95 CI 8.80-14.71, P<0.001; I2= 0%). Significant improvement was reported across validated rating scales of symmetry, functional outcomes, aesthetic outcomes, and patient-reported outcomes while superiority compared to other procedures remain inconclusive.

Conclusion: Overall, temporalis-based facial reanimation surgery is a promising option for addressing the negative effects of facial nerve paralysis on patients' quality of life. The study highlights the uncertainty surrounding the technique and the need for further studies.

Overcoming the three-dimensional complexity of vulvar defects: a stepwise, multi-flap approach

Presenter: Chuan Han Ang

Background: Complex vulvar defects are challenging owing to their three-dimensional nature and proximity to the vaginal, urethral, and anal orifices. The purpose of this paper is to introduce the concept of a multi-flap reconstructive approach to these defects based on anatomical subunits.

Methods: Four female patients with complex vulvar defects characterized by involvement of the vaginal wall, the anal canal and the perineum, secondary to extra-mammary paget's disease or squamous cell carcinoma resection, were studied. Defect size ranged from 108 to 157cm2. The outcomes were analyzed clinically and by a 4-point questionnaire regarding micturition, defecation, coital function, introitus opening and aesthetics.

Results: The anatomical subunits of the vulva were covered primarily by the gluteal fold flap, with additional flaps including the mons pubis rotation flap, the gracilis muscle flap, and the medial thigh VY advancement flap. The associated perianal skin and anal canal defects were covered by the buttock VY advancement flap and the gluteal fold flap. There were no flap complications. The average follow-up duration was 7 years. Patients' satisfaction with their aesthetic and functional outcomes was favorable.

Conclusions: Gluteal fold flaps were the workhorse flaps for perineal reconstruction of defects involving the vulva and anus. Additional local flaps were employed strategically in a staged manner, with the aim of preserving native anatomical features and minimizing functional impairments.

Papaverine Loaded Injectable and Thermosensitive Hydrogel System for Prevention of Vascular Spasm to Improve Flap Survival in Rat Dorsal Skin Flaps

Presenter: Hwan Jun Choi
Co-Author: Hyun Kim

Purpose: Vasospasm during reconstructive microsurgery is a common, uncertain and devastating phenomena concerning flap survival. Topical vasodilators as antispasmodic agents are widely used to reduce vasospasm and enhance microvascular anastomosis in reconstructive microsurgery.

Materials and Methods: In this study, thermo-responsive hydrogel (CNH) was fabricated by grafting chitosan and hyaluronic acid to Poly(N-isopropylacrylamide) PNIPAM where, Papaverine an anti-spasmodic agent was loaded (CNHP0.4) to evaluate rat skin flap survival. Mobility during application and injectability through small orifice that can fill spaces after surgery are the clinical advantages of thermo-responsive hydrogels. Physicochemical characteristics of grafted hydrogel and in-vitro biocompatibility of papaverine loaded hydrogels were studied.

Results: post-operative flap survival area and water content of rat dorsal skin flap were measured after 7 days of intradermal application of control hydrogel (CNHP0.0) and Papaverine loaded hydrogel (CNHP0.4) groups. Tissue malondialdehyde (MDA) content and superoxide dismutase (SOD) activity was estimated to determine oxidative stress in the flaps by enzyme linked immunosorbent assay (ELISA). H&E staining and immunohistochemistry (IHC) was used for evaluating flap angiogenesis and inflammatory markers. Results showed that, CNHP0.4 hydrogel could reduce tissue edema, improve flap survival area, increase SOD activity and decrease MDA content. Furthermore, it also significantly increased mean vessel density with upregulated CD34 and VEGF expression and decreased macrophage infiltration with reduced CD68 and CCR7 expression via IHC staining.

Conclusions: Overall, these results indicate that papaverine loaded hydrogel (CNHP0.4) possesses enhanced angiogenesis, anti-oxidative and anti-inflammatory effects which promote skin flap survival by preventing vascular spasm.

Patient reported outcomes 1 year following head and neck cancer reconstruction: a prospective cohort study

Presenter: Nicola Fleming, MD
Co-Authors: Kevin Nguyen, Derek Neoh, MD, Sally Ng, MBBS, DIPSURGANAT, FRACS

Introduction: Head and neck cancers (HNCs) and their surgical and adjuvant therapy are associated with significant impacts on patients. Patient reported outcome measures (PROMs) are increasingly being used to assess health-related quality of life (QOL), including functional and aesthetic outcomes. The FACE-Q Head and Neck Cancer Module (FACE-Q) is a validated PROM for patients undergoing HNC reconstructive surgery, evaluating physical, emotional and psychosocial impacts. The aim of this study

is to assess PROMs with FACE-Q before and 1 year post HNC surgery in a tertiary referral centre.

Method: In this prospective cohort study, 15 English speaking participants (6 male, 9 female) over 18 years old (mean 65 years old) undergoing free flap HNC reconstruction completed FACE-Q before and 1 year post-operatively. Demographic, operative and adjuvant therapy data was assessed in conjunction with FACE-Q scores.

Results: There were significantly worse outcomes in all functional domains including speaking, swallowing, eating and oral competence, and all symptom distress domains except appearance at 1 year post-operatively for the total cohort, with no difference in cancer worry or information satisfaction. 9 of 14 domains had a range of 0-100 for scores at 1-year in areas including appearance, smiling, speaking, and all areas of symptom distress.

Discussion: PROMs provide patients and clinicians with objective data to assist in functional and aesthetic assessment post-operatively. At 1 year following HNC surgery, participants reported a wide range of outcomes, highlighting the variety of patient experience. This study provides an opportunity to expand our understanding of longer-term patient experience following HNC reconstruction.

Perception of Patients, Physicians, and Chaperones Regarding the Use of Chaperones During Patient Examinations for Plastic Surgery: A Systemic Review

Presenter: Zhen Yu Wong
Co-Authors: kai Qi Ou, Zhen Ning Wong

Background: Using chaperones during patient examinations is widely regarded as a rational and cautious approach, particularly in the current litigious society. However, there is a scarcity of information related to the use of chaperones during patient examinations of body areas where plastic and reconstructive surgery is performed.

Methods: In this systematic review, we searched electronic databases for literature addressing physician use of chaperones during examinations of patients undergoing plastic surgery from the perspective of the patient, physician, and chaperone from inception of the database until April 2023.

Result: We included seven studies in a systematic review. We conducted an inductive thematic analysis of four domains (physician perspective, patient perspective, chaperone perspective, and chaperone documentation). The results of the analysis showed that surgeons who are experienced, are men, or have received education related to using chaperones are more likely to provide chaperones during patient examinations for medico-legal protection and patient comfort. A small percentage of surgeons have faced accusations from patients of inappropriate behavior. Most of these

incidents have occurred without a chaperone present. Patients who have long associations with a particular plastic surgery practice are less likely to want a chaperone. When physicians examine nonsensitive areas, most patients prefer having no chaperone. However, young patients and patients undergoing reconstructive procedures are more likely to request chaperones. Patients prefer having family members or friends serve as chaperones. Notably, despite the presence of a chaperone, we found that documentation of the presence of a chaperone was inadequate.

Conclusion: Further research, including qualitative studies and multinational approaches, is warranted to gain deeper insights and develop comprehensive guidelines for chaperone use that empowers both patients and healthcare providers.

Peripheral Blood Mononuclear Cells (PB-MNCs) For the Treatment Of Chronic Tissue Dystrophy In A Complex Case Of Lower Limb Reconstruction.

Presenter: Marco Castrechini

INTRODUCTION: A smoker patient diagnosed with Rhabdomyosarcoma of the anterior tibial muscle of the left leg was reconstructed, after oncological resection, with basic and advanced surgical procedures, always developing wound dehiscence. A local injection of PB-MNCs drove the last reconstructive technique to complete wound healing.

MATERIALS AND METHODS: A 25-year-old active smoker patient was diagnosed with Rhabdomyosarcoma (T2N0M0, stage IIIA) of the anterior tibial muscle of his left leg, treated with neoadjuvant chemo- and radiotherapy (RT). Following oncological demolition, the patient developed wound dehiscence with bone exposure and a perilesional chronic radiodermatitis. After many surgical debridements and reconstructions made by skin grafts and dermal substitutes with poor outcomes, the dehiscence was subsequently treated by covering the exposed bone with a reverse sural fascio-cutaneous flap. At 13 days post-operatively, a new wound dehiscence was observed, without clinical signs of infection. A new split thickness skin graft was performed, and a concentrate of autologous Peripheral Blood Mono Nuclear Cells (PB-MNCs) was injected at level of the flap and in the perilesional skin.

RESULTS: 14 days after PB-MNCs injections, the graft-take was reached as well as improvements in perilesional tissue trophism and, in about 2 months of follow-up, the wound dehiscence sites were completely healed. An improvement of the lesion and perilesional trophism demonstrated the efficacy in neoangiogenesis enhancing vascular supply during chronic wound healing after PB-MNCs injections as a treatment.

CONCLUSIONS: Potential new strategies to improve healing of difficult wounds and radiation injuries are important in the field of plastic surgery, and this seems to be a novel description of PBMNC's. Indeed, PB-MNCs, showed a good efficacy in this cases,

but further evidences as for the methods above mentioned, are awaited to best investigate this new therapeutic approach.

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Potential anti-cancer effect of vascularized lymph node transfer

Presenter: Erika Kusajima, MD
Co-Author: Taku Maeda, MD

Background: Lymphedema is considered to increase the risk of cancer progression. Recent reports have indicated that vascularized lymph node transfer (VLNT) may improve the impaired immunity in lymphedema but there has been limited number of reports concerning anti-cancer immunity. In the early tumor immune response, dendritic cells participate in tumor recognition and antigen presentation in local lymphatics. The purpose of this study is to investigate the impact of VLNT on dynamics of dendritic cells against cancer in mouse models.

Methods and Materials: Forty-seven 8-week-old C57BL/6N male mice were divided into three surgical groups: a VLNT model in which a vascularized inguinal lymph node flap was transferred into the ipsilateral fossa after a popliteal lymph node was removed; a lymph node dissection model in which the popliteal lymph node was dissected; and a control model in which a skin incision was made at the popliteal fossa and an ipsilateral inguinal lymph node was removed. Postoperative lymphatic flows were observed by indocyanine green lymphography and B16-F10-luc2 mouse melanoma were implanted into the ipsilateral footpad. The proportion of dendritic cells in the transplanted nodes was measured by CD11c immunohistochemistry using digital imaging analysis 4 days after cancer implantation. Metastases to the lungs and lymph nodes were quantitatively

evaluated by luciferase assay 4 weeks after cancer implantation.

Results: After VLNT, lymphatic reconnection was observed in 59.2% of mice. The proportion of dendritic cells was significantly higher in the VLNT group with lymphatic reconnection (8.6% ± 1.0%) than in the naïve lymph node (4.3% ± 0.4%) ($P < 0.001$). The tumor burden of lung metastases was significantly less in the VLNT group with lymphatic reconnection compared with the lymph node dissection group ($P = 0.049$).

Conclusions: Metastasis decreased in mice with reconnected lymphatics after VLNT. A possible explanation was that lymphatic restoration may have contributed to the tumor immune response by allowing dendritic cells migration to lymph nodes.

Quality of the Information provided by ChatGPT for Patients in Breast Plastic Surgery: Are we already in the future?

Presenter: Francesca Romana Grippaudo, MD, PhD
Co-Authors: Alice Patrignani, Simone Nigrelli,

Introduction: In the recent years Artificial Intelligence has grown in popularity also in the field of Plastic Surgery for patients is becoming more and more common to use internet to gather plastic surgery information and chatbot based on AI, such as ChatGPT, could be used for answering patient's questions.

The aim of this study was to assess the quality of medical information provided by ChatGPT regarding three of the most common procedure performed in breast surgery: Breast Reconstruction, Breast reduction and Augmentation mammaplasty.

Methods: The quality of information was evaluated through the Expanded EQIP scale. Responses where collected from a pool made by ten resident doctors in Plastic Surgery and then processed by SPSS software vers. 28.0.

Results: The analysis of the contents provided from ChatGPT showed a sufficient quality of the information in all the topic selected, with an high bias in terms of distribution of the score between the different items. There was a critical lack in the "Information data field" (0/6 score in all the 3 investigations) but a very high overall evaluation concerning the "Structure data" (>7/11 in all the 3 investigations).

Conclusion: At the present time, AI could be an useful tool for patients, but some critical issues that need to be faced from engineers and developers are still present. It's definitely possible that in the future models like ChatGPT will play an important role in improving patient's consciousness about medical procedures and surgical interventions, but their role must be considered ancillary to the one of the surgeons.

Refinement of autologous breast reconstruction by 3D image simulation and printing

Presenter: Cherng-Kang Perng, M.D., Ph.D.

3D image simulation was developed for pre-operative planning of autologous breast reconstruction with free DIEP flap. Standing 3D surface imaging fused with chest wall CT scan accurately estimated breast volume and shape. The mean absolute error between estimated and actual mastectomy volume was 84+-61 ml, significantly lower compared to 196+-145ml by 3D image alone and 188+-157ml by MRI. Computer-simulated appropriate DIEP flap design and virtual surgery were guided by the estimated mastectomy volume. The mean absolute error between the estimated and actual DIEP flap volume was 141+-80 ml. 3D image of vascular perforators and pedicle was also obtained from CTA of abdominal wall.

Intra-operatively, 3D printed mold of DIEP flap design served as a template for flap harvest, and 3D image of vascular perforators and pedicle was projected to abdominal wall by a portable projector to facilitate dissection. 3D printed mold of breast surface and chest wall also served as template for flap shaping and inset.
From 2015 to 2022 103 immediate autologous breast reconstruction with free DIEP flap was included. Total flap loss was 2 and flap success rate was 98.1%. Subjective outcome was evaluated by Breast-Q version 2.0 reconstruction module scales at post-operative 6 months. The results were psychosocial well-being 67.43+-22.22, sexual well-being 47.55+-23.91, and satisfaction with breast 60.46+-19.09. Post-operative photo was evaluated by the software of BCCT.core (Breast Cancer Conservation Treatment. cosmetic results) as objective outcome. 15.49% excellent and 60.56% good results were obtained.

By our pre-and intra-operative imaging protocols autologous breast reconstruction with free DIEP flap can be refined subjectively and objectively.

Respiratory complications in breast reconstruction patients: clinical features and thoughts on prevention

Presenter: Alisha Fong
Co-Authors: William Blake, MD, Jieyun Zhou, MD,

Background: Respiratory complications in patients undergoing abdominal-based free flaps for breast reconstruction poses a notable risk to patients in the postoperative period. In the literature the rates of these complications vary between zero to six percent, and may include pulmonary embolisms, pneumonia and fluid overload. There are numerous contributing patient factors, intraoperative and postoperative aspects, which lead to negative patient outcomes, need for additional investigations and prolonged in inpatient admissions. Ultimately, these respiratory complications take a toll

on our patients' recovery and add burden to the healthcare system.

Method: A review of 100 consecutive patients undergoing deep inferior epigastric artery perforator (DIEP) or transverse rectus abdominis myocutaneous (TRAM) free flap reconstructions following mastectomy from a single site was undertaken. Primary outcomes assessed were the rate of respiratory related complications, including number of fluid overload, pneumonia, pulmonary embolism, and pneumothorax. Preoperative risk factors such as patient comorbidities, smoking status, body mass index (BMI) and neoadjuvant chemotherapy were also accounted for. Intraoperative factors such as use of venous thromboembolism prophylaxis, intravenous fluid replacement and duration of surgery were collated.

Conclusion: The risk of postoperative respiratory complications in patients following abdominal free flap reconstruction continues to be significant and can impact patient recovery and increase the strain on our already overburdened healthcare system. We should look towards the prevention of these complications in the pre-, intra- and postoperative settings. In particular, there is growing evidence supporting prehabilitation in major cancer surgery with a focus on patient education and risk factor modification. This, in combination with early mobilisation and education on chest physiotherapy in the postoperative period may help to reduce rates of respiratory complications and improve outcomes for these patients.

Risk Factors for Miniplate-Related Complications in Free Fibula Flap Oromandibular Reconstruction: A Retrospective Analysis

Presenter: Wen-Chung Liu, MD
Co-Authors: Wen-Chung Liu, M.D., Ph.D.; Kuo-Chung Yang, M.D.
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Background: Microvascular free flap reconstruction of mandibular defects using an osteocutaneous fibular free flap is standard following tumor ablation. Miniplate fixation ensures stable osseous fixation, but complications such as plate exposure and screw loosening can necessitate further intervention. This study identifies risk factors associated with miniplate-related complications in free fibula flap mandibular reconstruction for head and neck cancer patients.

Methods: A retrospective review of 214 patients aged over 18 who underwent segmental mandibulectomy and free fibula flap reconstruction with miniplate fixation between January 2015 and December 2023 was conducted. Data on patient characteristics, flap size, adjuvant therapy, osteotomies, defect size, defect location, and complications were collected and analyzed.

Results: Miniplate-related complications requiring plate removal occurred in 22 patients (10.28%). Postoperative radiotherapy (HR: 4.37, 95% CI: 1.09–17.50, p = 0.037),

preoperative radiotherapy (HR: 5.516, 95% CI: 1.48–24.85, p = 0.044), and multiple osteotomies (HR: 3.483, 95% CI: 1.10–15.21, p = 0.037) were identified as independent risk factors for plate-related complications.

Conclusions: While fibula flap reconstruction with miniplates exhibits a low rate of complications, patients receiving preoperative or postoperative radiotherapy and those undergoing multiple osteotomies have a higher risk of plate exposure.

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RISK OF BLEEDING AFTER THE USE OF LOW MOLECULAR WEIGHT HEPARIN IN ABDOMINOPLASTY

Presenter: Nicolle Victoria Costa De Andrade, MD
Co-Authors: Fernanda Abibi, Fabio Nahas, MD, PhD, MBA, FACS, Lydia Ferreira MD, PhD

Introduction: The shape and contour of the abdomen play a crucial role in an individual's aesthetics and self-esteem but can be affected by various factors such as sedentary lifestyle, weight gain, pregnancies, and previous abdominal surgeries. Abdominoplasty, or abdominoplasty, is a commonly performed surgical intervention to correct these changes and improve body contour. Along with its popularity, abdominoplasty presents potential complications, including deep vein thrombosis and pulmonary embolism, which are considered serious due to their high rates of morbidity and mortality (1). The use of Low Molecular Weight Heparin (LMWH) in post-abdominoplasty has been limited to patients considered high risk for thromboembolic events due to concerns about a possible increase in post-surgical bleeding incidence

(2).

Objectives: This study aimed to assess the risk of bleeding and hematoma in patients undergoing classic abdominoplasty who received low molecular weight heparin as thromboembolic prophylaxis.

Methods: A prospective clinical study at Federal University of São Paulo - UNIFESP, from March 2011 to May 2013, included thirty female patients undergoing standardized abdominoplasty. After surgery, they were split into Control (mechanical prophylaxis only) and Study (LMWH for seven days) groups. Blood samples collected preoperatively and on postoperative days 1, 2, and 7 assessed hemoglobin and hematocrit levels. Daily drain outputs monitored early postoperative bleeding. Procedures followed a consistent protocol.

Results: There were no significant differences between the groups regarding bleeding, decrease in hemoglobin and hematocrit levels, or presence of hematoma. Both groups showed a reduction in hemoglobin and hematocrit levels after seven days of the postoperative period, with no statistically significant differences between them.

Discussion: Deep vein thrombosis is a concerning complication in abdominoplasties due to factors such as increased intra-abdominal pressure and postoperative immobility (3). The use of LMWH as prophylaxis has been debated due to the fear of increasing the risk of postoperative bleeding. In the present study, it was observed that the prophylactic use of LMWH did not significantly increase bleeding, nor did it contribute to an increase in the incidence of hematoma. Safety in thromboprophylaxis with LMWH was observed in the present study, with no statistical difference between drain output, hemoglobin and hematocrit decrease, and presence of hematoma among the studied groups.

Conclusion: Patients undergoing abdominoplasty who received LMWH as thromboembolic prophylaxis did not show a significant increase in bleeding or hematoma compared to those who did not receive the medication. This suggests that the use of LMWH may be safe and effective in preventing thromboembolic events in patients undergoing abdominoplasty.

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Sequentially Linked Flaps for Correction of Extensive Post-Burn Deformity and Achieving Dynamic Reconstruction Outcomes

Presenter: Bommie Florence Seo, MD
Co-Authors: Younhwan Kim, Hyung-Sup Shim, MD, PhD

Introduction: Autologous skin grafting has been the popular method for reconstructing post-burn defects. However, this technique has limitations such as high contracture rates, inadequate volume coverage, and limited availability of donor sites.(1) This report aims to describe the principles and advantages of utilizing microsurgically linked perforator flaps for the reconstruction of extensive burn defects and associated post-burn scar contracture in the lower and upper extremities and trunk.

Method: A total of 20 patients who underwent free tissue transfer for primary and secondary burn wound reconstruction at a single institution between 2016 and 2023 were included in the study. All patients received sequentially linked flaps for the correction of post-burn deformities. Postoperative results were evaluated, including flap survival, complications, and the DASH self-report questionnaire for upper extremity reconstruction.

Result: Among the 20 patients, 12 required primary reconstruction, while 8 underwent secondary reconstruction using anastomotic chimeric free tissue transfer. The majority of burn injuries resulted from thermal contact(40%, n=8), followed by flames(25%, n=5), scalds(20%, n=4), electrical contact(10%, n=2), and friction(5%, n=1). The most frequently utilized combinations were the thoracodorsal artery perforator(TDAp) and anterolateral thigh(ALT) flap(11 cases, 55%). Additionally, four cases involved the pedicled TDAp flap in conjunction with the deep inferior epigastric artery perforator(DIEP) flap. The average DASH score for upper extremity burn patients was 10.58.

Conclusion: Three-dimensional tissue coverage achieved through the sequential linkage of two or even three independent free flaps is increasingly utilized in post-burn reconstruction. This approach offers multiple advantages and represents a viable option for burn reconstruction. (2-4)

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STROMAL VASCULAR FRACTION ASSOCIATED WITH ACELLULAR DERMAL MATRIX ON THE HEALING OF SKIN WOUNDS IN RABBITS - COLLAGENIC, ANGIOGENIC AND HEALING POTENTIAL

Presenter: Nicolle Victoria Costa De Andrade, MD
Co-Authors: JOSE CARVALHO, JR, Lydia Ferreira, MD, PhD

Introduction: Skin integrity loss poses a significant challenge to the healthcare system, particularly in cases of scarring, burns, and cutaneous losses. Acellular Dermal Matrix (ADM) stands as an effective option, yet its efficacy may be compromised due to low vascularization (1). Approaches such as combining it with stem cells hold potential for enhancing wound healing (2,3). The Stromal Vascular Fraction (SVF) of adipose tissue could also be a promising addition to ADM, although studies exploring this possibility are lacking.

Objective: For evaluating the effects of SVF combined with ADM on skin wound healing in rabbits.

Methods: This is an experimental, in vitro and in vivo, primary, interventional, analytical, prospective, longitudinal, comparative study conducted at a single center in the Cell Culture and Tissue Engineering Laboratory - Federal University of São Paulo (UNIFESP). The study was approved by the UNIFESP Animal Ethics Committee.
It involved a sample of 24 rabbits, divided into four groups. Three 20 x 20 mm skin wounds were made on the dorsum of the animals, with the only procedure performed in the Control Group. In the ADM group, the wounds were covered with Acellular Dermal Matrix. In the SVF group, 2 x 106 autologous SVF cells were injected at the wound margins, and in the ADM/SVF group, SVF cells were injected, and the wounds were covered with ADM. The wounds were photographed for 21 days, and biopsies were performed at 3, 14, and 21 days to evaluate skin thickness, collagen quantification, and assess blood vessel formation and diameter. All samples were evaluated by an independent and blinded evaluator regarding the groups.

Results: There was no difference in wound healing time between groups.

The ADM/SVF group showed greater dermal and epidermal thickness, higher amounts of collagen types I and III, and a greater number and diameter of blood vessels when compared to the control, ADM, and SVF groups individually.

Discussion: The analysis of results revealed significant differences between groups, with the group receiving both interventions (ADM/SVF) demonstrating better outcomes in terms of skin thickness, collagen density, and vascularization. These findings

underscore the therapeutic potential of SVF in conjunction with ADM in skin regeneration. Further studies to understand the biochemical, genetic, and cellular aspects of SVF may aid in comprehending its molecular-level interaction in skin healing.

Conclusion: SVF associated with ADM increased vascularization, collagen quantity, and skin thickness during skin wound healing in rabbits, without altering wound closure time.

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Surgical Management and Early Recurrence of Extracranial Arteriovenous Malformations: A 15-Year Retrospective Cohort Study in Japan

Presenter: Makoto Shiraishi, MD, PhD
Co-Authors: Mitsunaga Narushima, MD, PhD, Yuta Moriwaki, MD, Chihena Banda, MD, Masakazu Kurita, MD, Mutsumi Okazaki, MD, PhD, Professor

The concise purpose: Treatment of extracranial arteriovenous malformations (AVMs) remains a significant challenge for plastic surgeons. Wide variations in the clinical course and unpredictable recurrence have precluded the establishment of a gold standard treatment regime, and there is limited evidence on the surgical and non-surgical factors associated with recurrence. This study aimed to evaluate the effectiveness of surgical treatment options, in terms of size reduction, symptoms, and early recurrence in patients treated surgically for AVMs.

The methods and materials used: A retrospective cohort study was conducted to evaluate patients with AVMs following surgical treatment in 2 centers from 2005 to 2020. Post-treatment lesion size and symptoms, and recurrence were assessed with follow-up period more than 6 months. Multiple regression analysis was performed to identify factors associated with recurrence after treatments.
Experience including number of cases and follow-up: Forty-four surgical treatment cases in 31 patients were assessed with a mean follow-up duration period of 67.9 ± 39.5 months. Treatment included total resection in 26 cases (59.1%) and partial resection 18 (40.9%), with free flap coverage used in 19 cases (43.2%). No acute

exacerbation following treatment was observed in our cohort.

Summary of results: Total resection significantly reduced post-treatment lesion size ($p < .001$), symptoms ($p < .001$), and recurrence (20.0%; $p = .03$). The recurrence rate was significantly higher after partial resection (73.7%; $p = .03$). Total resection was identified as an associated factor for significantly reduced AVM recurrence (Odds ratio 0.12; 95% Confidence interval: 0.03, 0.52). However, the use of free flaps did not significantly reduce recurrence, post treatment size or improve AVM symptoms.
Reasonable and understandable conclusion: In this 15-year multicentre retrospective study, we evaluated the factors associated with AVM recurrence and resolution of signs and symptoms following treatment. We focused on assessing the role of surgical resection and free flap coverage following resection and the roles of non-surgical therapies. We found that total resection significantly reduced post-treatment size, symptoms, and recurrence. The recurrence rate was significantly higher after partial resection with no difference between case treated with and without free flap coverage although the reccurent lesions did not infiltrate areas covered by free flaps. This result gives insight on the concept of "regulating flaps" for treating large AVMs proposed by Dompmartin, et al. (Br J Plast Surg. 1998;51:561-3.) Our results collectively suggest that total resection is the optimal choice for treating AVMs but still requires the larger cohort and longer follow-up study in the future.

Surgical management of the hand in Apert Syndrome: a 27-year experience.

Presenter: Rini Vyas Mbchb (U.K. Equivalent To MD)
Co-Authors: Molly Jakeman, Bsc (Hons), Mbchb, MRCS, Maria Kelly, Paul McArthur

Aims: Complex acrosyndactyly in Apert syndrome requires nuanced planning to achieve optimal functional outcomes. This study reviewed the surgical management of hand differences in Apert syndrome over a 27-year period, at a single tertiary-care institution.

Method: A retrospective case series reviewed all children with Apert syndrome managed by our Paediatric Hand Surgery unit between 1997 and 2024. Medical and operative records, clinical photographs and radiographic images were evaluated. The primary aims were to determine the total number, timing and techniques of hand operations. The secondary aim was to establish how many patients achieved five-fingered hands.

Results: 21 patients (12 male, 9 female) were managed by our unit. 24 hands (57.1%) were Upton type 1; 10 (23.8%) were Upton type 2; and 8 (19.0%) were Upton type 3. Three patients died prior to staged hand surgery completion. Timing of hand surgery depended on craniofacial procedures and comorbidities. Median age at first syndactyly operation was 19 months (range: 5 months – 4 years). A five-fingered hand was achieved in 64.7%, including 71.4% of Upton type I and II hands and 33.3% of Upton

type III hands. All planned webspaces were separated by a median age of 4 years 11 months (range: 2 years 11 months – 12 years 1 month), requiring an average of 5.8 operations (SD 1.57). 62 (60.8%) syndactyly releases were performed without skin grafts.

Conclusions: An individualised approach within a multi-disciplinary setting is required for Apert syndrome patients to determine the ideal operative timing, surgical technique and reconstructive goals.

Surgical site infection and patient reported outcomes in surgically treated soft tissue facial injury:A Meta-Analysis

Presenter: Zhen Yu Wong
Co-Authors: Justin Wormald, MD, Maksim Richards, Justin C R Wormald

Background: Soft tissue facial injuries (STFI) constitute a significant portion of craniofacial trauma but the risk of surgical site infection (SSI) and the patient-reported outcomes (PROs) following surgical management of STFI are unknown.
Methods: A PRISMA-compliant search was conducted, and meta-analysis was performed using R. Pooled effects of outcomes were estimated using the DerSimonian and Laird random-effects model/generalised linear mixed model, when feasible.

Result: Out of 8,897 screened studies, 38 were included. 12 studies reported PROMs, while 28 studies reported SSI rates following operative treatment for STFI. The pooled SSI rate (n=28) was 3.30% (95%CI 1.89%-5.71%). Surgical and non-surgical closure didn't differ significantly in SSI rate. PROs focused on scar outcomes, cosmetic outcomes, quality of life, and psychological impact. Subgroup analysis showed lower SSI risk in operative repair for general facial trauma compared to primary repair, and in general facial trauma compared to other aetiologies. The direct pairwise analysis of surgical closure versus tissue adhesive in SSI rate (n=5) was found to have no statistically significant superiority (RR 1.91 (95%CI 0.63-5.82, p=0.585, I2 = 0%). The pooled patient scar assessment scale (PSAS), score at 6-12 months post-intervention (5 studies, n=217) was 16.16 (95%CI 15.34-16.97). Limited evidence was found regarding the effect and superiority of surgical treatment in cosmetic outcomes, quality of life and psychological impact.

Conclusion: Our findings emphasise the limited and unreliable evidence available concerning PROs following operative treatment for STFI. Future studies employing robust methodologies are needed to investigate optimal approaches for managing STFI effectively.

Systematic Mapping Review of Applications of Extracorporeal Shockwave Therapy (ESWT) in Hand Surgical Conditions

Presenter: Zhen Yu Wong
Co-Authors: Ryan Faderani, Oluwatobi Adegboye, Muholan Kanapathy, Afshin Mosahebi

Aim: This systematic mapping review aims to systematically identify, elucidate, and categorise existing evidence regarding the utilisation of shockwave therapy in hand surgical conditions.

Methods: Adhering to the PRISMA guideline, we conducted a thorough search to identify studies investigating the application of shockwave therapy in hand surgery conditions. Data extraction followed predetermined eligibility criteria, and evaluated outcomes were systematically classified into four dimensions: clinical assessment, Patient-Reported Outcome Measures (PROMs), neurophysiological tests, and a miscellaneous category.

Results: A total of 43 studies were incorporated, comprising 9 case series, 1 cohort study, and 33 randomised controlled trials (RCTs). Most investigations focused on Carpal Tunnel Syndrome, with other conditions, including Trigger Finger, Dupuytren's disease, post-CTRS pillar pain, Hypertrophic hand scar, Kienbock's Disease, de Quervain tenosynovitis, Osteoarthritis, and Scaphoid wrist nonunions, also examined. Spanning from 2011 to 2023, a discernible upward trend in studies was noted, with Iran and Turkey collectively contributing to nearly half of the included studies. Most investigations reported short-term benefits in clinical and PROMs outcomes, with complications being infrequent and of mild nature. The delivery protocol for shockwaves exhibited heterogeneity in terms of intensity and frequency. Observations on shockwave intensity and frequency's dose dependency for clinical efficacy, reported in some studies, remain inconclusive. A majority of RCTs exhibit a high/moderate risk of bias. Limited evidence supports the beneficial impact of shockwave therapy in the other hand surgical conditions.

Conclusion: Standardisation of shockwave therapy frequency and intensity is imperative. The administration of shockwave therapy reveals a dose-dependent effect devoid of major complications, with noteworthy short-term efficacy, primarily serving as an adjunct. While the literature is robust for CTS, meticulously designed RCTs are indispensable for comprehending the efficacy in other hand surgical conditions.

THE HAND AND WRIST: ANTIMICROBIALS AND INFECTION (HAWAII) TRIAL

Presenter:: Justin Wormald, MD
Co-Authors: Wormald JCR, Rodrigues JN, Bheekharry R, Riley N, Tucker S, Furniss D, Dunlop R, Jones R, Appelbe D, Herbert K, Prieto-Alhambra D, Cook JA, and Costa ML, on behalf of the HAWAII Collaborative

A feasibility study of antimicrobial sutures in hand trauma surgery

Background: Hand trauma, comprising injuries to both the hand and wrist, affects over five million people per year in the NHS, and results in around 250,000 operations per year. SSI following hand trauma surgery results in significant morbidity. Triclosan-coated sutures may reduce SSI in major abdominal surgery but have never been tested in hand trauma surgery. Feasibility needs to be ascertained before a definitive trial can be delivered in hand trauma surgery.

Methods: A multi-centre, feasibility RCT involving adults undergoing surgery for hand trauma to evaluate feasibility for a definitive trial. Secondary objectives were incidence of SSI in both groups, hand function measured with PROMs, HRQoL and change in employment. Treatment was allocated using a Randomisation was performed on a 1:1 basis, stratified by age of the patient and whether the injury was open or closed, using a secure, centralized, online randomisation service. Participants were blinded to allocation.

Results: 116 participants were recruited and randomised: (60 intervention, 56 control). Of 227 screened, most were eligible (89.5%), and most who were approached agreed to be included in the study (84.7%). Retention was low: 57.5% at 30 days, 52% at 90 days and 45.1% at six months. Incidence of SSI was 20% in both groups. Hand function deteriorated after injury but recovered to near pre-injury levels during the study period.

Conclusions: A definitive RCT of antimicrobial sutures in hand trauma surgery is feasible, if retention is improved. Retention strategies, including monetary incentives, efficient PROMs, real world data linkage, should be employed.

The Immediate Postoperative Result Made by Large Saline Volume May Reduce Complaints in Thread Lift Patients – The Primacy Effect

Presenter: Ara Kim, MD

Introduction: Thread lift, one of common facial rejuvenation procedures, is prone to patient complaints because of its no-release nature. This is especially true when volume filler is not combined with the absorbable threads. Despite the importance of volume replacement, some patients reject filler for financial reason and later complain the suboptimal results. The author determined if the primacy effect, the phenomenon that an individual's thought is strongly affected by the first impression, can reduce the rate of frustrating complaints associated with thread lift.

Method: All consecutive patients who underwent absorbable thread lift were reviewed from a prospectively maintained data base in one institution from January 2023 to December of 2023. The immediate postoperative result of thread lift was optimized by

infusing lidocaine-containing saline to deep medial fat compartment (1), nasojugal, nasolabial, and marionette region. Patients were immediately reassured with a physician that their creases were dramatically corrected. The revisit rate with patient complaints was compared between two groups who had the immediate saline inflation and reassurance during thread lift and who did not.

Result: Of 214 thread lift patients, 181 patients underwent traditional methods and 33 patients underwent the immediate saline inflation and reassurance. The revisit rate for complaint was significantly lower in the immediately inflated-reassured group (6.1 percent, 2 patients versus 23.2 percent, 42 patients, $p = 0.03$). The number of adjunct procedures including filler and high intensity focused ultrasound was comparable for both groups.

Conclusion: Thread lift is not without complaints in patients with high expectation, but the immediately good first impression with volume trick and reassurance may reduce the chance of patient revisit. Contrary to traditional surgeries which pursuit good long-term result, minimally invasive plastic surgeries can aim for the good immediate result.

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The Potential Therapeutic Effect of PRP for the Diabetic Foot: Neglected Deep Plantar Abscess Case Report

Presenter: Stefania Riza MD
Co-Authors: Ruxandra Sinescu, MD, PhD, Patricia Alina Cepi, ANDREI POROSNICU

Background: Normal wound healing is a complex and well-organized process which involves cell migration, cell proliferation and extracellular matrix deposition. However, chronic illnesses such as diabetes can lead to the dysregulation of cellular and molecular signals during this process.

Methods: This paper presents a case report on the use of Platelet-Rich Plasma (PRP) in the treatment of diabetic foot. The goal is to deliver growth factors into the wound in order to promote the healing process.

Results: PRP, being a simple procedure, it can be done as a outpatient procedure and in diabetic patients may have a role in limb sparing surgery.

Conclusion: The present paper underscores the ongoing research on the potential therapeutic effects of PRP in managing diabetic foot complications. Our experience suggests positive outcomes and accelerated wound healing with PRP, while taking into

consideration that the effectiveness may vary based on factors such as patient history, wound type, and PRP application protocols.

The resident-run operating room in a tertiary referral center in Argentina and a proposal for a new classification of complications in minor surgery

Presenter: José Viñas, MD
Co-Authors: Breyner Garcia Rodriguez, MD, Horacio Mayer, MD, FACS

Background: At our Plastic Surgery Department an operating room for minor surgery in charge of residents has been established in order to increase their surgical autonomy as surgeons. On the other hand, minor surgery lacks a standardized classification of postoperative complications based on criteria relevant to plastic surgery. We developed a new classification of surgical complications based on the severity of the intervention required for treatment, the setting in which the patient is treated and the medical costs of treatment. The aim of this study is to evaluate the safety of procedures performed independently by residents and to apply this new classification of complications to minor surgery.

Methods: We retrospectively evaluated 375 patients who were operated at the minor surgery operating room by residents with a follow-up of at least 1 month. The overall complication rate was calculated and the classification system proposed by the authors was applied to assess the severity of complications. Grade A includes complications that are treated in the outpatient setting. Grade B includes those that require the patient to return to the operating room or be hospitalized. Grade C corresponds to life-threatening complications requiring intensive care. Finally, grade D corresponds to the death of the patient. Finally, the Clavien-Dindo classification, which was compared with the latter.

Results: The mean age was 49.9 years and 65.3% were female. The most prevalent diagnoses were cysts (88, 22.2%), lipomas (72, 18.1%), malignant skin lesions (61, 15.4%), dysplastic nevi (56, 14.1%), pathologic scars (24, 6.0%). Among the most frequently performed procedures were simple resection and closure (311, 78.5%), flap reconstruction (39, 9.8%) and earlobe plasty (27, 6.8%). When applying our classification of complications, we recorded a total of 59 complications in 55 (14.6%) patients. Fifty-six (94.9%) complications were mild and managed on an outpatient basis. Thirteen (22.0%) of these complications did not require any additional intervention beyond those expected for the type of surgery (grade A1). On the other hand, thirty-six (61.0%) complications of the same degree of severity required some type of additional behavior or follow-up in the outpatient setting and were classified as A2. Among the latter, the most frequent complication was small wound dehiscence (7, 1.8%), followed by superficial surgical site infection (6, 1.6%), seroma (5, 1.3%), extruding sutures (5, 1.3%), epidermolysis (3, 0.8%) and hematoma (2, 0.5%), all of which required at least

one additional visit to the office for treatment and/or follow-up. Only three (0.8%) patients required reoperation under local anesthesia, with wound dehiscence being the most frequent cause (2, 66.6%). On the other hand, we recorded 20 (33.9%) more complications than using the Dindo-Clavien classification.

Conclusions: The minor surgery operating room under the care of residents is a safe strategy for patients that allows for increased autonomy in procedures. The new classification of complications proposed by the authors makes it possible to record complications that escape the Clavien-Dindo classification and to classify them according to criteria useful to plastic surgeons. This study should be considered as a proof of concept to evaluate its applicability and further studies with a larger cohort of patients should be performed in order to get validation.

Key words: plastic surgery residency; minor surgery; complications; Clavien-Dindo.

The Tool to Reduce Opiate Use - the DIEP Flap ERAS Protocol

Presenter: Ofuchi Egbuji
Co-Authors: Mona Saad, MBBS, Bsc, Pgcert, Med, ED, Shikha Gupta, MD, Anais Rosich-Medina, Dhalia Masud, MD

Aims: A retrospective audit of the deep inferior epigastric perforator (DIEP) flap enhanced recovery after surgery (ERAS) protocol 6 months after implementation (post-ERAS group) and 5 months after opiate reducing interventions.

Method: Avoidance of patient-controlled analgesia (PCA) was emphasised at the local governance meeting in May 2021 and subsequent pre-operative briefings.
The post-ERAS group (n=30, June - December 2020), were then compared with the intervention group (n=39; October 2021 - March 2022). The audit standards were obtained from the Oncoplastic Reconstruction Guidelines and the local ERAS protocol. Data was collected from paper and electronic notes.

Results: The unplanned readmission rate was 0% in the post-ERAS group and in the first 3 months of the intervention group. The unplanned return to theatre rate decreased by 6.6% in the second 3 months in the post-ERAS group and decreased further to 5.1% (p 0.64) in the intervention group. The mean length of stay was similar (2.9 days post-ERAS group, 3.5 days post-intervention group).
The mean total oral morphine use in milligrams was lower in the intervention group (74 v 91, p 0.39). Within the first 0-12 hours less equivalent oral morphine was utilised (20 v 45). PCA was used in fewer patients (15.4% v 19.2%). 30.8% had no opiates after 24 hours in the intervention group (35.4% had no opiates after 24 hours in the post-ERAS group).

Conclusion: The ERAS protocol, departmental teaching and discussing PCA use in

pre-operative briefs has helped our unit reduce opiate use and unplanned return to theatre.

The use of OASIS Extracellular matrix in complex reconstruction of the lower leg after massive avulsion

Presenter: Davor Jurisic, PROF., M.D., Ph.D., FEBOPRAS
Co-Authors: Sara Gudelj, Dea Sabo, Ivan Sebaher

Purpose: OASIS Extracellular Matrix (ECM) is a medical product that can be used for management of complicated wounds, including third-degree burns, many kind of ulcers (chronic vascular, diabetic, venous), and several other wound conditions where mechanical protection of underlaying tissue is needed. It's made from porcine small intestinal submucosa, providing a natural scaffold for cellular migration and wound healing. This matrix supports the formation of granulation tissue and is involved in angiogenesis, which are critical steps in the wound healing process (1).

Methods and materials: In the course of this case report, patient data were used from the Department of plastic and reconstructive surgery, University Hospital Center Rijeka, Croatia. A 30-year-old male, a motorcyclist, with a previous history of type I Diabetes Mellitus, sustained multiple traumatic injuries including a compound fracture of the tibia and fibula with extensive soft tissue damage, an avulsion fracture of the medial malleolus, and a traumatic open wound on the forearm with arterial involvement. After being treated by the traumatologist, the patient was transferred to the Plastic and reconstructive surgery department for further reconstructive treatment of residual defect. For the purpose of optimal treatment, reevaluation of the therapy for diabetes as well as hyperbaric oxygen therapy was conducted. Five days after admission, a necrectomy was preformed resulting in exposure of anterior border of the tibia that was deperiosted in whole exposed area. In purpose to close the defect, this procedure was followed by a reconstruction using an acellular dermal matrix. To complement the functional structure, a skin graft harvested from the left thigh, ensuring a comprehensive approach to wound closure. Postoperatively, the wounds were treated with a vacuum-assisted closure (VAC) system to encourage granulation tissue formation and to promote graft acceptance and wound healing.

Summary: Successful limb salvage was achieved with no postoperative complications, such as infection or rejection of grafts. The patient's wounds exhibited minimal granulation tissue, and there were no signs of chronic non-healing ulcers at the time of discharge. Finally, the patient underwent a tailored physiotherapy program early to maintain joint mobility and muscle strength.

Conclusions: Oasis ECM played a crucial role in promoting wound healing by providing a biocompatible scaffold that supports cell infiltration, tissue regeneration and ultimately, wound closure (2). The continued use and study of OASIS and similar

products are likely to yield new insights into wound management, potentially revolutionizing the approach to treating complex wounds and enhancing the body's natural healing processes with aesthetically pleasant result superior to the ones achieved with free flaps. This aligns with the broader trend in healthcare towards more personalized and advanced treatment options, emphasizing the role of such technologies in shaping the future of medical care, saving costs and time.

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The use of superficial temporal vessels as free flap recipients in head and neck reconstruction. Systematic review, cadaver dissection and clinical experience.

Presenter: Belén Andresen Lorca

Background: Superficial temporal (ST) vessels have classically been source of doubts and fears regarding their reliability as recipient vessels in head and neck (H&N) reconstruction1. The last years, though, have seen a notable increase in their use for this purpose, with growing evidence suggesting they are as safe as any other recipient vessel in the region.

Materials and methods: We conducted two systematic reviews, one on their surgical outcomes as free flap recipients and the other on their anatomic characteristics, both following PRISMA2020 guidelines. These were complemented with 15 cadaver dissections and a 40-patient case-series, contrasting our evidence with the published literature. Data analysis was performed using SPSS.

Results: ST vessels are as reliable as other recipient vessels in the H&N region, with mean flap survival rates of 97.84% (overall reported rates of free flap survival in H&N reconstruction ranging from 95 to 98%)2. According to literature, one can expect an arterial diameter of 1'98 ± 0'30 mm at the level of the zygoma and 2'32 ± 0'24 mm at the vessel's origin, translating a percentual increase of 5'7 - 8'6% for every 1 mm of proximal dissection3,4. Our cadaver study and clinical experience support this evidence.

Conclusions: The superficial temporal vessels are safe and reliable as free flap

recipients in H&N reconstruction, showing a flap survival rate equivalent to the one reported in the literature for any other recipient vessel. Both the published literature and our cadaver study demonstrate they have a suitable anatomy to serve as recipient vessels.

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Thinking outside the box and inside the affected area: Combined local flaps for auricular reconstruction after partial amputation.

Presenter: Patricia Jimenez
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Reconstruction of the auricle is a challenging problem. Here we describe a case of auricular reconstruction following partial ear amputation, including the helix and antihelix up to the concha. The patient requested a reconstructive option using only tissue from around the affected ear.

MATERIALS AND METHODS: To meet her request, we decided to combine three previously published local flaps, a combination that, to our knowledge, had not been described before:

-Posterior conchal chondrocutaneous flap, designed as an inferiorly based transposition flap of the same width as the defect, to support and cover the new antihelix posteriorly (1).
-Preauricular dermocutaneous flap, inferiorly based, to provide skin coverage to the anterior surface of the new antihelix, tunnelled through the earlobe to reach the defect (2).
-Post-auricular bipedicled interpolated tubular flap, designed to reconstruct the helix (3).

The procedures were performed in three stages, under local anaesthesia and on an outpatient basis.

RESULTS: Auricular reconstruction using the described technique allowed adequate restoration of anatomical structures.

CONCLUSIONS: When the defect is extensive, most auricular reconstruction techniques require the use of rib cartilage grafts, approaching the reconstruction as a total ear defect. However, techniques have been described to avoid the morbidity associated with the use of costal cartilage graft by combining multiple flaps. Most of them use chondrocutaneous flaps as described by Antia and Buch (4) and modifications of them, such as the one described by Yotsuyanagi et al (1). Based on this concept, we decided to add as well the tubular bipedicled flap to improve the helix reconstruction, and we preferred the preauricular skin flap for its greater versatility. The need for three surgical steps could be considered a disadvantage in comparison with other techniques, but we believe that it is fully justified by the quality of the helix reconstruction obtained. Other techniques using advancement flaps can hardly produce enough tissue to reconstruct a well-defined helix, which is a fundamental aesthetic feature. The main advantages of the combination of the three techniques described above are the possibility of performing it under local anaesthesia, the fact that it does not require the use of donor areas other than the affected ear, and its reliability. We believe that the need for three operations is justified by the superior aesthetic results that can be achieved.

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To combine or not to combine? NPWT and silver nanoparticle dressings on lower limb skin grafts

Presenter: Abdalah Abu-Baker
Co-Authors: Daniela Ion, Daniela Elena Gheoca Mutu, MD, PhD, Adelaida Avino, MD, Laura Raducu, MD, PhD, Cristian Radu Jecan, MD, PhD, FEBOPRAS

Introduction: One useful tool in a plastic surgeon's toolkit is skin grafting. A number of dressing methods were created to promote graft integration. Negative pressure wound therapy improves graft survival by aspirating secretions, stimulating neoangiogenesis, and creating an anti-inflammatory environment. Additionally beneficial to epithelialization, silver nanoparticle dressings have an antibacterial impact and provide a humid environment. Thus, the use of silver nanoparticles in conjunction with negative pressure wound therapy (NPWT) requires further research.

Materials and methods: Between January 2020 and January 2024, 92 patients admitted to the Plastic Surgery Department of "Prof. Dr. Agrippa Ionescu" Emergency Clinical Hospital were included in a comparative prospective study, which aimed to evaluate the effects of silver nanoparticle sheets versus the combination of silver nanoparticle dressings and negative pressure wound therapy. The patients were randomly distributed into the two study groups. A number of variables were tracked, including graft-related information such graft integration, size, and defect origin, as well as patient comorbidities. After surgery, dressings were changed and the graft condition was assessed seven, ten, and fourteen days later. Furthermore, baseline levels of C-reactive protein (CRP) were assessed prior to surgery as well as at 7-, 10-, and 14-day threshold.

Results: The research showed that using NPWT in conjunction with AgNPs improved the integration of skin grafts at all evaluation points. Considerable differences in graft integration were also noted in relation to graft size, grafted defect origin, and presence of diabetes or cardiovascular disease. Furthermore, patients treated with NPWT in addition to silver dressings had a statistically significant improvement in C-reactive protein levels 10 days after surgery, which is consistent with the near full integration of skin grafts at this evaluation threshold.

Conclusion: Postoperative development of split-skin grafts is influenced by multiple factors. In order to additionally improve graft integration, postoperative dressings focus on correcting local variables with the intention of obtaining a healing-prone medium. Our study showed that the novel use of silver nanoparticle sheet in conjunction with NPWT-assisted dressings produced better benefits for graft integration and a reduction in systemic inflammation.

Vascular Variation of Temporoparietal fascia in Microtia Associated with Hemifacial Microsomia

Presenter: Hojin Park MD

In microtia associated with hemifacial microsomia (HFM), ear reconstruction poses challenges owing to anatomical and vascular variations. A comprehensive understanding of the vascular anatomy is essential to safely elevate the temporoparietal fascia (TPF) flap and provide framework coverage. This study analyzed vascular variations in microtia associated with HFM.

A retrospective analysis was conducted on 47 patients with microtia and HFM, who underwent computed tomography angiography between November 2011 and May 2022. The vascular course and branching, supplying the TPF were analyzed. Craniometric measurements were conducted to determine the horizontal distance from the porion and fronto-zygomatic suture (F–Z suture) to the vessels.

On the affected side, the TPF were primarily supplied by either the superficial temporal artery (STA) or postauricular artery-originated STA (Po-STA). The Po-STA (n=29) was more prevalent than STA (n=18), and it mostly exhibited a single frontal branch (n=20). Craniometric analysis revealed that the Po-STA was closer to the porion, ear vestige, and F–Z suture than the STA on the non-affected side. Furthermore, a significant correlation was observed between the severity of mandibular hypoplasia and presence of Po-STA variation (Cramer's V=0.498, p=0.005).

Microtia associated with HFM exhibits vascular variations in the TPF, particularly a unique Po-STA variation. The Po-STA is prone to injury during ear reconstruction because of its proximity to the external auditory canal and ear vestige. Surgeons should be cautious of these anatomical variations for safer ear reconstruction procedures and utilize preoperative imaging for meticulous planning.

Versatility of free fibula in distal radius and carpal replacement

Presenter: Johannes Tobias Thiel
Co-Authors: Adrien Daigeler, Jonas Kolbenschlag, MD, Henrik Lauer

Introduction: Resections of bone tumors or trauma in the region of the radius and / or carpus may require complex osseous reconstruction to preserve the upper extremity. Illustrated by three case studies, we discuss our treatment algorithm with regard to osseous reconstruction in the interval from the distal radius to the metacarpus and the possible advantages and disadvantages of each technique.

Material and methods: For many years, resection of the distal radius and fusion of the scaphoid, lunate and radius by microvascular fibula transfer (RFSL fusion) was successful e.g. for recurrent giant cell tumors of the distal radius. The disadvantage of this technique is a significant movement restriction. One option for a joint reconstruction is fibula transplantation including the head of the fibula creating a neo-radiocarpal joint and reconstruction of the extrinsic ligaments and the distal radioulnar joint. In case the entire carpus needs to be replaced, reconstruction using a triangular, microvascular

fibula is an option in order to fuse both the metacarpal bases and the distal radius.

Results: The reconstruction of the distal radius by RFSL fusion is a standardized concept for bridging long-distance defects of the distal radius. However, only a maximum range of motion in the radiocarpal joint of 30° (extension/flexion) can be expected. By replacement of the distal radius with a free fibular head, postoperative ROM of the wrist reaches 90° (extension/flexion). Iatrogenic peroneal lesion resulting a (mostly) temporary drop foot should be mentioned. In the case of complete loss of the carpus, the triangular free fibula with fusion of the radius and the MHK bases 2-5 offers a stable configuration with limited supination and pronation.

Conclusion: In the case of large bony defects of the radius and carpus, reconstruction with free fibular head transplant should be considered in young patients with sufficient preoperative wrist function. The advantage is a significantly better postoperative wrist function compared to an RFSL fusion, which is, however, a valuable alternative with lower donor site risk. If the entire carpus and distal radius needs to be replaced, the authors believe that bony fusion using a triangular free fibula is worth being considered.

Video-assisted prepectoral breast reconstruction following mastectomy

Presenter: Adelaida Avino MD
Co-Authors: Daniela Elena Gheoca Mutu, MD, PhD, Laura Raducu, MD, PhD, Cristian Radu Jecan, MD, PhD, FEBOPRAS

Introduction: Breast cancer is currently impacting millions of women globally, with nearly 2 million cases diagnosed annually. It is recognized as a complex disease with surgery being a crucial step in its treatment. However, mastectomy significantly affects quality of life, posing a considerable challenge for women. Breast reconstruction, whether performed immediately or at a later stage, offers the potential for improved outcomes, particularly benefiting younger women and enhancing their quality of life. The quest to reduce incision size and improve aesthetic outcomes has prompted breast surgeons to adopt endoscopic techniques in breast cancer surgery. This study aimed to evaluate the outcomes of video-assisted prepectoral breast reconstruction for 3 patients.

Method and Results: A retrospective analysis was conducted on 3 patients who underwent video-assisted prepectoral breast reconstruction following mastectomy in 2023. Patient demographics, surgical characteristics, complications, and aesthetic outcomes were evaluated. Using this technique, we have successfully reduced the operating time for a traditional mastectomy and breast reconstruction from 220 minutes to just 150 minutes. There was no major postoperative complication. One patient had experienced partial skin ischemia. The patients reported satisfaction with their aesthetic outcomes.

Conclusions: Video-assisted prepectoral breast reconstruction following mastectomy demonstrates favorable outcomes in terms of reduced operation time, postoperative pain and satisfactory aesthetic results in our patients. So, it is an improvement in patient outcomes while minimizing invasiveness in breast cancer surgery. Further studies with larger sample sizes and longer follow-up periods are warranted to validate these findings and refine surgical techniques.

Virginal Breast Hypertrophy: a case report and revision of current literature

Presenter: Alicia Gonzalez
Co-Author: Pablo Benito Duque, MD

Virginal breast hypertrophy (VBH) is a rare and benign condition that usually presents in adolescents as a rapid and exaggerated growth of the mammary gland in a unilateral or bilateral fashion.

Although its etiology remains unknown, histopathological and biochemical findings point towards an increased sensitivity of the estrogen receptors located in the breast tissue to normal blood levels of estrogen.

In this poster, we present the case of an 11-year-old girl, premenarcheal, with no relevant past medical history, who consulted for erythema and painless asymmetrical growth in both breasts during the previous 10 days.

Despite treatment with NSAIDs and oral antibiotic therapy, symptoms worsened during the next weeks. Blood tests, including a complete hormonal study, showed no alterations; and ultrasound imaging was normal. A breast tissue biopsy was then performed, obtaining a result of "epithelial and angiomatous hyperplasia of breast stroma".

Given these outcomes, virginal breast hypertrophy was accepted as a diagnosis of exclusion.

The patient underwent bilateral reduction mammaplasty in an effort to avoid mastectomy and achieve better results in terms of aesthetics. During immediate post-op, she presented unilateral hematoma and secondary partial nipple-areola complex necrosis.

Two months post-op, and after menarche, she presented with unilateral left side recurrence. A bilateral nipple-sparing mastectomy was then performed.

One year after mastectomy, the patient remains free of recurrence, and she is ready to start with her implant-based breast reconstruction with tissue expanders.

For the purpose of this case, a revision of the literature about virginal breast hypertrophy was performed. Of a total of 86 publications evaluated, 55 of them were "Case report" articles; a total of 75 cases were reviewed, and only 64 of them satisfied inclusion criteria. 65% of the cases were treated with reduction mammaplasty, while 27% of the cases underwent mastectomy. The remaining 8% followed medical treatment. Among surgical cases, 61.5% (24) of reduction cases presented recurrence, as opposed to 20% (3) of mastectomy cases. Medical treatment, Tamoxifen in particular, could be considered as a first step, although doses and duration remain unclear and side effects should be taken into account. Articles agree surgery should be performed as soon as possible. The optimal surgical technique choice is controversial: while reduction mammaplasty allows better cosmetic outcomes, mastectomy offers a lower recurrence rate.

Wound dressing 'fat bag' for wounds: method for conditioning aspirated fat in wounds

Presenter: Gustavo Moreira Costa de Souza MD
Co-Authors: Haylla Haramoto, Felipe Romano Gonçalves Carvalho, Conrado Reis Costa

Introduction: Wound treatment has always been a major challenge in medical practice, probably being one of the oldest areas of Medicine. Wounds with significant tissue loss, severe burns, polytrauma, and infections can lead to acute and chronic wounds that are difficult to treat.

Objective: To describe the method developed for grafting aspirated fat into complex wounds, sometimes with exposure of noble tissues, in association with negative pressure wound therapy.

Method: A moderate amount (about 100cc) of fat is collected with a 4mm diameter aspiration cannula ('macrofat'). The aspirated fat undergoes simple decantation for 30 minutes to separate the liquid phase and oily phase. After debriding devitalized tissues from the wound, a moist gauze sheet with petrolatum is sutured with a simple linear suture on the skin adjacent to the wound . Next, through a counter-opening, by incision away from the wound margins, in natura fat grafting is performed with 1.8mm or 2.0mm cannulas around the wound margins ('lipofilling') and over the ulcerated area of the wound to fill the dead space between the wound and the previously sutured petrolatum gauze. The sutured gauze is filled until a distension volume is reached, at the limit of fat extravasation through the simple linear sutures.

Discussion: Wound treatment with fat grafting in a vaselined gauze bag allowed the use of a moderate amount of fat in the wound, with little waste and good graft stability. Due to fat containment, it also allows ease of changing secondary dressings and the association with negative pressure wound therapy (NPWT), with good adaptation and very favorable and promising results. It also allows the fat to remain on the wound bed with stability for an extended period (up to 15 days or more).

Results: The described technique demonstrated good conditioning and wound coverage, aiding in its resolution. Fat grafting in a 'fat bag dressing' showed low morbidity in patients.

Conclusion: A method of fat grafting on wounds with the aid of fixed petrolatum gauze ('fat bag') has been described.

Y-shaped muscular wrapping technique to avoid re-infection of a replaced aortic graft: Latissimus dorsi muscle flap with a distally based serratus anterior extension

Presenter: Itaru Tsuge, MD
Co-Authors: Naoki Morimoto, MD, Susumu Saito, Hiroki Yamanaka, Michiharu Sakamoto, MD, Naoki Morimoto

Purpose: Replacing an infected prosthetic thoracic aorta graft carries a high risk of reinfection. Pedicled omental wrapping is the first choice for covering the newly implanted graft; however, if there is a history of omental flap use or other abdominal surgeries, another method is necessary. We previously reported two clinical cases successfully treated with a new breakthrough surgical method for salvaging aortic graft infection using a Y-shaped muscle flap containing the latissimus dorsi (LD) muscle flap with a reverse serratus anterior (SA) muscle flap. An additional cadaveric study proved the regular existence of the distal attachment area and an appropriate way of safely elevating this combined muscle flap. We present a new case in which the Y-shaped muscular wrapping technique was applied for the establishment of this method.

Methods: Three clinical cases of infected aortic grafts were salvaged using a Y-shaped muscular wrapping technique for complete muscular coverage of the aortic arch and descending aorta. Six human cadavers were used in an additional cadaveric study, which was performed using the Thiel embalming technique to retain flexibility. The cadavers were donated for research and education purposes, with the donors formally agreeing to the use of their bodies by signing the donation form. The study was approved by the Kyoto University Medical Ethics Committee (approval number: R1785). We checked for the existence of a distal attachment area between the LD and the SA. The combined muscle flaps were elevated proximally while identifying the thoracodorsal artery, including the LD and SA branches. After the SA branch was ligated and cut, the SA muscle was manually peeled from the LD muscle, leaving only the distal tight attachment area.

Results: All six cadavers showed a distal tight attachment area from the seventh rib to the ninth rib. Finding the layer to enter the back of the SA muscle was easy when we elevated the flap from the posterior-to-anterior direction by cutting the thoracolumbar fascia to enter the layer between the LD muscle and the rib periosteum. After cutting off the SA muscle insertion at the scapula and origin on multiple ribs, the combined LD and SA muscle flaps were elevated while preserving the distal attachment area. In the new

clinical case, an intraoperative indocyanine green test demonstrated distal arterial flow from the LD muscle to the entire area of the reverse SA muscle.

Conclusions: The cadaveric study and clinical cases established the reliability of the new Y-shaped muscle wrapping technique. The key was the advancement of the pivot point of the SA muscle using the distal continuity between the LD and SA. We learned how to perform a stable procedure to elevate this new muscle flap. A typical LD flap elevation starting from the anterior edge of the LD muscle in the posterior direction was not suitable. However, the posterior-to-anterior approach made the combined muscle flap easier while maintaining the distal attachment area between the LD and SA. We believe that this is a breakthrough surgical method for salvaging life-threatening aortic graft infections.