2018 GLOBAL PARTNER ABSTRACTS

Medial Femoral Condyle Free Flap for Nasal Reconstruction: A New Technique for Full Thickness Nasal Defects

Presenter: Mario Cherubino, MD. Febopras , plastic surgery, University of Insubria, varese, Italy

The nose is a functionally complex organ that plays a critical role in breathing, olfaction and phonation with a relevant part also in aesthetic self-acceptance. The reconstruction of full-thickness nasal defects necessitates the restoration of all the three nasal layers. Since no ideal donor site can provide all these tissues in a single step, generally several procedures need to be performed; for this reason, secondary, surgical refinements are frequently required to achieve a harmonious nasal contour. However, in some cases, long term stability cannot be granted due to partial graft reabsorption. The medial femoral condyle free flap (MFCf) represents a suitable solution as it allows the simultaneous reconstruction of both the mucosal and skeleton layer. During the same surgical procedure, a forehead flap is performed to cover the external nose layer, thus allowing the reconstruction of the nasal pyramid main frame to take place in a single stage. The MFCf provides a thin cortico-periosteal tissue that can be easily fold in a roof-like shape without hampering its vascular network.

Materials and methods: Since November 2015 seven patients with a full-thickness nasal defect underwent nasal reconstruction using the MFCf and a combined forehead flap. The periosteum of the MFCf was used to replace the internal lining while the cortical bone to restore the scaffold. The bone was stabilized with titanium mini plates and then a forehead flap was harvested for the external layer. Outcomes were assessed through a questionnaire about the patients' postoperative quality of life (Derriford Appearance Scale 24).

Results: All patients were satisfied. No secondary debulking procedures was needed. Follow-up was 7-24 months.

Conclusion: The MFCf associated with a simultaneous forehead flap allows the reduction of the numbers of surgical procedures. The MFCf represents a valid surgical option to successfully manage full thickness nose defects, allowing a reliable contour stability over time.

Bioequivalence and Dose-Response of Adipose Derived Cells in Augmentation of Random Pattern Skin Flap Survival

Presenter: Vincent Khwee-Soon Tay, BSc(Hon), MD, MMED(Surgery) , Plastic, Reconstructive & Aesthetic Surgery, Singapore General Hospital, Singapore, Singapore

Co-Authors: Wing Yue Chan, PhD, Plastic, Reconstructive & Aesthetic Surgery, Singapore General Hospital, Singapore, Singapore; Wei-Qiang Sim, BSc., Plastic, Reconstructive & Aesthetic Surgery, Singapore General Hospital, Singapore, Singapore

Purpose: Adipose derived cells have demonstrated proangiogeneic potential in skin flap survival[1-2]. However, many questions are left unanswered and impede easy translation to clinical practice. No study to-date has compared the relative efficacy of subtypes of adipose derived cells or demonstrated dose-response relationships for optimal dosing. This preclinical study seeks to compare and demonstrate dose-dependent effect of different adipose derived cells in promoting survival of random pattern flap in a rodent dorsal skin flap model, and to investigate the potential differences in mechanism involved in their efficacy.

Methods and materials: Thirty-five adult Sprague-Dawley rats were randomized into one control and six treatment groups. Allogeneic rat adipose-derived stem cells (rADSCs) characterized using differentiation assays and flow cytometric analysis were used in three dosage groups (ie. $0.4x10^6$, $2x10^6$, $10x10^6$cells respectively), and autologous stromal vascular fraction (rSVF) were isolated from the inguinal fat pads and used in another three dosage groups (ie. $0.4x10^6$, $2x10^6$, $10x10^6$cells respectively). A caudally based 3x10cm dorsal skin flap was raised in each animal. Control medium or adipose-derived cells (ie. rADSC or rSVF) were injected sub-dermally into the panniculus carnosus distal to the mid-length of the flaps before inset. Animals were observed to postoperative day 7 before image recording of flap for flap necrosis and harvest of tissue for quantitative polymerase chain reaction (qPCR) analysis and immunohistofluorescence (IHF) analysis.

Results: The rADSC were immunophenotyped to be CD31-, CD34-, CD45-, CD73+, and CD90+ and the cells can be induced into the chondrogenic, osteogenic and adipogenic lineages. Dose-dependent trends of flap necrosis were observed in both rADSC and rSVF. The $2x10^6$cells treatment groups demonstrated optimal efficacy in the dose range (ie. control group 45.3% necrosis versus 29.2% and 26.6% flap necrosis in rADSC and rSVF groups respectively). The $10x10^6$ cells treatment groups were noted to have a possible adverse effect on flap survival (ie. rADSC with 47.4% and rSVF with 47.3% flap necrosis). qPCR and IHF analyses demonstrated upregulation of proangiogeneic, lymphangiogeneic and antiapoptotic factors in treatment groups, and differences between rADSC and rSVF groups.

Conclusion: This study reports the dose-dependent effect of adipose derived cells in promoting random pattern flap survival and more importantly the bioequivalence in efficacy between allogeneic rADSC and autologous rSVF. An optimal dose for promotion of flap survival probably exist with higher doses being counterproductive. The mechanisms of action between rADSC and rSVF in promoting flap survival may differ and requires further investigation to elucidate.

References:

1. Lu F, Mizuno H, Uysal CA, Cai X, Ogawa R, Hyakusoku H. Improved viability of random pattern skin flaps through the use of adipose-derived stem cells. Plast. Reconstr. Surg. 2008; 121: 50-58.
2. Foroglou P, Karathanasis V, Demiri E, Koliakos G, Papadakis M. Role of adipose-derived stromal cells in pedicle skin flap survival in experimental animal models. World J Stem Cells 2016; 8(3): 101-105.

Anatomical Implants in the Subfascial Plane

Presenter: Javier Jesus Jesus Vera Cucchiaro, MD , AESTHETIC CLINIC, Salta, Argentina

Background: In the last ten years, an increasing number of athletic women in whom it is important to preserve the pectoral muscle, are presenting for breast augmentation. This is the prime indication for augmentation in the subfascial plane using anatomical implants. Ideally, this result is less capsular contracture, more natural results and lower rotation index. However, a great degree of surgical precision is necessary. The pectoral fascia provides excellent coverage of the upper pole and also camouflages the implant borders, whether they are round or anatomic, because the fascia obscure the edges of the prosthesis. Anatomical devices with stable forms are superior to those implants with low cohesive filling. They also have low grade of capsular contracture, rippling and rupture leading to very natural results and high degrees of patient satisfaction.

Methods: A retrospective analysis of 9 years of patients who underwent breast augmentation from January 2009 to May 2018 was undertaken 728 patients under surgery, 579 with anatomical implants (80%) and 149 (20%) with round implants. All patient underwent primary bilateral augmentation in the subfascial plane. The implant sizes varied from 220 cc to 620 cc with 320 cc high profile implants most often employed. All patients were operated upon with local anesthesia and intravenous sedation, supplemented with intercostals and pectoral blocks, always administered by a Anesthetist. The surgery was ambulatory.

Results: For primary aesthetic breast augmentation the revision rate was 7.53%, necessitated by Baker grade III-IV 2.07%, infection 0.5%, explantation 0.5%, seroma 0.69%, rotation 2.07%, hematoma 0.5% and scar revision 1.2%. It is important to highlight that there were no cases of breast implant-associated ALCL in our patients, recognizing that Argentina has reported only one case of ALCL. While the appearance that each patient prefers is highly subjective, the anatomical implant is frequently preferred by patients who desire a natural results. As is the case in every augmentation mammoplasty, breast shape and width, the height of the lower pole, ptosis of the breast, skin quality, asymmetries, chest wall anomalies and the amount of the soft tissue coverage needs to be critically considered in each case. It is necessary to perform surgery precisely to decrease the degree of rotation and to use implants with a larger vertical length to limit the horizontal dissection of the pocket.

Conclusions: Patients older than 35 years of age aften prefer anatomical devices for more natural results. For the slim athletic patients who have little coverage of tissue and need to preserve the pectoral muscle, the subfascial plane is an excellent option. These patients have less pain in the post-operative period due to the lack of pectoralis muscle incision, have less a requirement for pain killers with less potential addiction to opioid medication and have less disruption of tissue with high degrees of patient satisfaction.

BIBLIOGRAPHY

1. Graf RM, Bernardes A, Rippel IR, Damasio RC, Auersvald A. Subfascial breast implant: A new procedure. Plast Reconstr Surg. 2003,111:904-908.
2. Mallucci P, Brandfort OA. Design for natural breast augmentation; The ICE principle. Plast Reconstr Surg. 2016;137:1728-1737.

The Importance of the Transverse Facial Artery as Landmark, in the Identification of the Zygomatic Branch of the Facial Nerve

Presenter: Luis Eduardo Bermudez, MD, FACS , Plastic Surgery / Microsurgery, Military Hospital, Hospital San Ignacio, Fundacion Santafe de Bogota, Clinica Rivas, Bogota, Colombia
Co-Author: Jorge Scarpetta, MD, FACS , Plastic Surgery, Clinica Rivas, bogota, Colombia

Since our initial case report in 2004 describing the “masseteric-facial” anastomosis as babysitter, I had concerns going back to an already operated area to perform the second stage (nerve anastomosis between the stump of the cross-face nerve graft and that of a distal Zygomatic branch).
In the next 3 patients we operated on, we performed a retrograde dissection of the facial nerve in the parotid gland in order to perform a more proximal anastomosis (temporal division of facial nerve) with two purposes: To gain orbicularis oculli movement, to leave the soft tissue scarring proximal far from the site where the second anastomosis would be performed. But we obtained unacceptable outcomes due to mass movements.

Our goal today is to bring new axons to facial branches innervating the zygomatic muscles (to restore smiling) and orbicularis oculii of the lower eyelid (to improve lower lid laxity). For the upper lid we use (in case it is needed) a gold weight.

Identifying the facial nerve branches innervating those muscles is easy in the healthy nerve because we can use nerve stimulation, but in the nonfunctional nerve we would need to follow distally the nerves to find out their target muscle, which would create scar tissue increasing the difficulty of the second stage. Minimal dissection is the key when we are planning to perform a second stage.

Performing cross facial nerve grafts from the healthy nerve using nerve stimulation I have learned that there is a close relationship between the transverse facial artery and the branches of the facial nerve to the zygomatic muscles and lower eyelid.

Since 2009 I have standardized the technique, performing a minimal dissection 1 cm ahead the anterior border of the parotid gland using the transverse facial artery as landmark to choose the facial nerve branches that will receive axons from the masseter nerve.

Material and Methods: In this paper we retrospectively review the surgical outcomes using this technique in 35 patients operated from 2009 to 2017. Ten patients (60 years and older) received just the masseter to facial nerve transfer and 25 patients (59 years and younger) masseter to Facial and cross facial nerve grafts.

Results: Strong movement of the oral comissure elevators was obtained in all 35 patients. Improvement in the lower eyelid laxity was found in 28 patients .
14 out of the 25 patients scheduled for a second procedure decided to not undergo that additional procedure.

4 of the 10 patients with just masseter to facial transfer wished to have a second procedure to obtain an involuntary movement (cross facial nerve graft).
Lateral tarsorrhaphy was performed in 28 patients during the first stage.

A graft of palmaris longus as lower eyelid sling was performed in 3 patients.

An upper eyelid gold weight was placed in 10 of the 35 patients.

Conclusion: Consistent good outcomes restoring smiling movement in patients with facial paralysis were achieved using the Masseteric to Zygomatic nerve transfer using the transverse facial artery as landmark to choose the recipient nerve.

Improvement of Tracheal Substitute by Tissue-Engineered Tracheal Adventitia: A New Concept for Tracheal Tissue Engineering

Presenter: Li Chen, MD , Chang Gung Memorial Hospital Linkou Branch, Taoyuan, Taiwan
Co-Authors: Cherng-Shyang Chang, PhD , Chang Gung Memorial Hospital Linkou Branch, Taoyuan, Taiwan, Yi-Shiuan Lin, MS , Chang Gung Memorial Hospital Linkou Branch, Taoyuan, Taiwan, Chung-Kan Tsao, MD, Chang Gung Memorial Hospital Linkou Branch, Taoyuan, Taiwan

INTRODUCTION: Trachea resected patients usually suffer from poor prognosis due to difficulties of reconstruction. Allotransplantation for tracheal replacement is limited by donor shortage, rejection, and infection. Tissue engineering could bypass the limitations

above by utilizing autologous cells. Previously, we established an ectopic tissue-engineered vascularized trachea based on a poly(ε-caprolactone) (PCL) scaffold with muscle flap surrounding[1]. The muscle flap protected neo-trachea from degradation; however, the bulky flap may cause dysphagia or limit trachea motion. Thus, we developed a neo-trachea with tissue-engineered tracheal adventitia (TETA) by replacing muscle flap with fibroblast-based adventitia and tested whether the TETA prevents tracheal collapse and advance the chondrogenesis of the construct.

METHODS: The porous PCL scaffold with cylindrical structure was generated by a negative mold. The chondrocytes were seeded onto PCL scaffolds and *in vitro*-cultured in chondrogenic defined medium for four weeks. The construct was surrounded by fibroblast-based tissue-engineered tracheal adventitia, and was cultivated for 1 week. The PCL neo-trachea was implanted subcutaneously in nude mice for four weeks, and the chondrogenesis of construct were evaluated by histological analysis.

RESULTS: The cylindrical structure of TETA-surrounded PCL neo-trachea remained after four-week *in vivo* cultivation. The immunofluorescence staining revealed that the TETA layer stayed intact without invasion from peripheral tissue to the adventitia or the neo-trachea. In comparison to the neo-trachea without adventitia, the chondrocytes density increased in the construct with TETA surrounding. The cartilaginous matrix, including proteoglycans and type II collagen, also showed prominent increasing in the TETA group. The terminal deoxynucleotidyl transferase dUTP nick end labeling (TUNEL) staining showed that the apoptosis of seeded chondrocytes was attenuated in the presence of TETA.

CONCLUSION: We demonstrated that TETA protected the chondrocyte-seeded construct from deformation after *in vivo* cultivation, increased the chondrocytes density and cartilaginous matrix and decreased apoptotic cell death in the construct. Our work provides a novel approach to replace muscle flap and simultaneously accelerate chondrogenesis which can be applied in tracheal tissue engineering for the treatment of tracheal resection patients.

REFERENCES:

Tsao C-K, Ko C-Y, Yang S-R, et al. An ectopic approach for engineering a vascularized tracheal substitute. *Biomaterials.* 2014;35(4):1163-1175.

Automatic Summarization of Burn Knowledge by Systematic Review Articles

Presenter: Charles Chih-Ho Liu, MD, MS , Dept of Plastic Surgery, Cathay General Hospital, Taipei, Taiwan
Co-Authors: Jian-Jr Lee, MD, PhD , Plastic Surgery, Cathay General Hospital, Taipei, Taiwan, Jau-Min Wong, MD, PhD , Institute of Medical Engineering, National Taiwan University, Taipei, Taiwan

Background: In the age of information explosion, the need of artificial intelligent tool for management of huge amount of medical literature rose. We developed an unbiased and robust algorithm for automatic summarization of a knowledge domain simply by the MeSH keywords of Medline literature, and validated the feasibility in all systematic review articles of burn injury.

Materials and Methods: 492 articles were retrieved from PubMed e-Utility search interface, by keywords of "systematic"[sb] and "burns"[Major], which means all the systematic reviews with MeSH term of "burns" as major topic. The top five journals and article numbers were Burns (116), J Burn Care Res (86), Cochrane Database Syst Rev (23), J Burn Care Rehabil (11), and Ann Plast Surg (7), from 1962 to 2017. 94% of the articles are after 2006.

All MeSH terms from the 492 Medline records were analyzed and were clustered by overlapped terms between the articles. Two naive criteria were used for the drawing of final knowlege maps -- 1) the minimum number of intersected terms (min), and 2) the Jaccard Index (J.I.), the number of intersected terms divided by the number of unions of those two articles.

Results: Five and four main knowledge skeletons were calculated without additional domain knowldege, by two criteria set [min. 4 and J.I. of 0.35] and [min. 5 and J.I. of 0.30]. The major skeleton compromised consistently of topics about epidemiology and risk analysis, which occupied about 2/3 of articles. The difference betwen the two graphs, and the small skeletons would be discussed from a surgical perspective, including the clinical practice guideline group, the wound care group, and the wound dressing group.

Conclusion: Automatic summarization of domain knowldeg and problem elucidation by MeSH terms from the free PubMed service is feasible. A large epidemiology knowledge skeleton and small wound skeletons were consistency by different criteria of the cluster analysis.

Acute Necrotizing Esophagitis: Case Reports and Review of Literature

Presenter: Li Ying Liao, MD , Plastic surgery, China Medical University Hospital, Taichung City, Taiwan
Co-Author: Hung-Chi Chen, MD, PhD, FACS , Department of Plastic and Reconstructive Surgery, China Medical University, Taichung, Taiwan

Background: Acute esophageal necrosis (AEN) is also known as black esophagus or acute necrotizing esophagitis. It is a rare esophageal disease with unknown etiology,

raising attention in recent decades. Its diagnosis is made by upper gastrointestinal endoscopy or pathologic study.

Objective: We want to share our experience in treatment and reconstruction of necrotizing esophagitis. The images are described, and the literature is reviewed.

Case Presentation:

Case 1: A 49-year-old man with history of hypertension and diabetes, came to our hospital after suffering from right chest pain with dysphagia for one week. Chest CT performed at emergency service showed rupture of esophageal mucosa with intramural esophageal dissection noted from thoracic inlet level, all the way to esophago-gastric junction, with infective fluid and gas collection in the intramural false lumen. Abscess formation up to 10 x 6 x 4 cm was noted in the right side of mediastinum, consistent with mediastinitis. Firstly, he received thoracoscopic mediastinotomy decortication for infection control then total esophagectomy and cervical esophagostomy. Meanwhile decompressive gastrostomy and feeding jejunostomy were also performed. Pathologic study showed necrotizing inflammation with perforation. Three months later he received reconstruction with gastric pull-up. However, a defect at posterior wall of cervical esophagus developed 1 month later. Thus, the plastic surgeon took over and free jejunum flap for reconstruction of cervical esophagus was performed. Patient has prompt recovery with smooth swallowing and nutrition status.

Case 2: A 17-year-old female was followed for 15 years post esophagus reconstruction due to pharyngitis causing esophagus destruction. She has pharyngitis at 6 months of age which extended to the esophagus causing esophageal necrosis. She received free jejunum flap and pedicle colon flap reconstruction at age 2. Now, after 15 years of flap follow up her esophagography showed smooth swallowing. She has good nutrition status and normal development so far.

Conclusion: We use free jejunum flap for cervical esophagus. It provides good motility for initiation of food passage and can be done safely both in children and adults. The long-term durability of jejunum for esophagus reconstruction is well established. The jejunum mucosa retains its original features with no metaplasia. For the thoracic part of esophagus, either gastric pull-up or pedicled colon flap is a good option.

Key words: Acute necrotizing esophagitis, free jejunum flap, gastric pull-up, pedicled colon flap

Comparison of 3D Nasal Anthropometry Between Beauty Pageant Contestants of Korea and Paraguay: Miss Korea vs. Miss Paraguay

Presenter: Min ji Kim, MD , Plastic and reconstructive surgery, University of Ulsan, College of Medicine, Seoul Asan Medical Center, Seoul, Korea, Republic of (South)

Co-Authors: Miguel A Gaxiola, MD , University of Ulsan, College of Medicine, Seoul Asan Medical Center, Seoul, Korea, Republic of (South), Sung Chan Kim, MD , University of Ulsan, College of Medicine, Seoul Asan Medical Center, Seoul, Korea, Republic of (South); Woo Shik Jeong, MD , Plastic Surgery, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea, Republic of (South); Kyung S Koh, MD, PhD , University of Ulsan, College of Medicine, Seoul Asan Medical Center, Seoul, Korea, Republic of (South); Jong woo Choi, MD, PhD , University of Ulsan, College of Medicine, Seoul Asan Medical Center, Seoul, Korea, Republic of (South)

Background: Beauty is one of the main ultimate goals in plastic surgery. There have been various efforts to find optimal aesthetic evaluation in order to reproduce cosmetically attractive results.[1,2] Among various factors that can affect beauty standards, interethnic variability in facial dimensions is an aspect of plastic surgery that has been studied consistently. [3] It is time to focus on ensuring measurements obtained by objective methods have not been tackled yet with such a consistency. In this study, we investigated measurable characteristics of nasal shape and dimensions exist between beauty pageant contestants of Korea and Paraguay focused on 3D nasal anthropometry.

Methods: Sets of 3D photographies were obtained from two groups of women: participants at two widely recognized beauty contests, 43 pageants from Miss Korea(Group Ⅰ) and 22 pageants from Miss Paraguay(Group Ⅱ). Twenty-seven soft tissue landmarks were marked on each face image; of these, six soft tissue landmarks are of interest for nasal analysis; nasal height, nasal width, nasofrontal angle, nasofacial angle, nasomental angle and nasolabial angle. Then we calculated some measurement using 3D images; nasal height/width proportion and nasal index, nasal proportions in relation to total facial height or width.

Results: Group Ⅰ had a higher nasal height (mean difference 2.41mm) and greater proportion of nasal height to width (mean difference 0.06), however, nasal width can be considered equivalent between both groups. Both Nasofrontal angle (mean difference 4.11°) and nasomental angle (mean difference 4.66°) resulted greater in Group Ⅰ. With respect to nasolabial angle, it showed a mean difference of 3.06° being greater in the Korean subset with no statistical significance ($p = 0.098$). All these differences were statistically significant.

Conclusions: We demonstrate a difference of nasal dimension and proportion from two sets of beautiful women that is necessary take into account a patient's racial and ethnic background. There are meaningful analysis based on these prototypical individuals who represent a subpopulation raising a need for a more ample view of transcultural aesthetics. Having in mind the concept of solid intercultural differences in the judgement of beauty, or at least some proofs pointing that the perception of beauty is influenced at some degree by geographic, ethnic, cultural, and demographic factors. Even though people have their own standard for beautiful face, we may not allow treat some possible biological influence and cross-cultural patterns with disdain.

References:

1. Kim S-C, Kim HB, Jeong WS, et al. Comparison of Facial Proportions Between Beauty Pageant Contestants and Ordinary Young Women of Korean Ethnicity: A Three-Dimensional Photogrammetric Analysis. *Aesthetic plastic surgery.* 2018;42(3):748-758.
2. Rhee SC, An S-J, Hwang R. Contemporary Koreans' Perceptions of Facial Beauty. *Archives of plastic surgery.* 2017;44(5):390.
3. Fang F, Chung KC. Reply: A Systematic Review of Interethnic Variability in Facial Dimensions. *Plastic and Reconstructive Surgery.* 2012;129(1):165e-166e.

Necrox-5 Ameliorates Inflammation by Skewing Macrophages to the M2 Phenotype

Presenter: Kyung Chan (KC) Ahn, MD , Plastic and Reconstructive Surgery, Seoul National University Bundang Hospital, Seongnam-si, Gyeonggi-do, Korea, Republic of (South)
Co-Authors: Chan-Yeong Heo, MD , Department of Plastic & Reconstructive Surgery, Seoul National University Bundang Hospital, Seongnam, Korea, Republic of (South), Bassem Elfeky, MD , Plastic & Reconstructive Surgery, Seoul National University Bundang Hospital, Seongnam-si, Korea, Republic of (South)

Capsular contracture around implants is the most common local complication after silicone breast implants, and there are currently no successful preventive treatments. Mounting evidence suggests that macrophage polarization plays a crucial role in the progression of the fibrotic capsule formation. This study aimed to evaluate the role of NecroX-5, a powerful anti-inflammatory agent, on the functional plasticity of macrophages and the possible underlying mechanism using RAW264.7 cells, a murine macrophage cell line. The change in cell morphology was examined by scanning electron microscopy. The expression of CD206, arginase (Arg)-1, inducible nitric oxide synthase (iNOS), and phosphor-signal transducer and activator of transcription (pSTAT) 6 were examined by western blotting. The production of inflammatory cytokines was detected by enzyme-linked immunosorbent assays, and statistical comparisons were made. The results showed that treatment of RAW264.7 cells with NecroX-5 caused an elongated shape in comparison to non-treated cells. The expression levels of macrophage mannose receptor CD206 and Arg-1, specific markers of M2 cells, were significantly upregulated by NecroX-5 treatment, while those of iNOS (M1 macrophages) was decreased. In addition, NecroX-5 significantly reduced the secretion of inflammatory cytokines, while IL-4 and IL-13 secretion in the supernatant was significantly enhanced. Significantly reduced pSTAT6 expression was also observed in NocroX-5-treated cells. These data suggested that NecroX-5 might dampen the

capsular contracture and fibrosis by switching the M1 phenotype to the M2 phenotype due to pSTAT6 induction.

Key Words: Capsular contracture; Macrophages; iNOS; Arg-1; NecroX-5

Bone Regeneration after Midline Distraction Osteogenesis of the Forehead for Metopic Craniosynostosis

Presenter: Soo Jung Kim, MD , Department of Plastic and Reconstructive Surgery, Yonsei University College of Medicine, Seoul, Korea, Republic of (South)
Co-authors: Kihwan Han, MD, PhD , Department of Plastic and Reconstructive Surgery, Keimyung University Dongsan Medical Center, Daegu, Korea, Republic of (South), Yong Oock Kim, MD, PhD , Department of Plastic and Reconstructive Surgery, Yonsei University College of Medicine, Seoul, Korea, Republic of (South)

Background: Surgical treatment of metopic craniosynostosis has primarily been used to expand the anterior cranial vault, and several trials are assessing the possibility of increasing the width of the frontal bone.[1-3] We investigated the efficacy of midline distraction osteogenesis and assessed the extent of distraction required for an optimal cosmetic result.

Methods: We performed 10-year follow-up to assess 13 patients treated surgically for nonsyndromic metopic craniosynostosis. A vertical frontal craniotomy was performed along the midline of the forehead with the application of a distractor to achieve optimal distraction osteogenesis for adequate lateral advancement. Using computed tomography (CT), we evaluated the degree of bone regeneration and also growth-related changes in forehead contour.

Results: Patients were divided into 4 groups. Group 1: the dura was detached from the inner table of the frontal bone and the extent of distraction was >15 mm, group 2: the dura was attached to the frontal bone and the extent of distraction was >15 mm, group 3: the dura was attached to the frontal bone and the extent of distraction was ≤15 mm and V-shaped, and group 4: the dura was attached to the frontal bone and the extent of distraction was ≤15 mm using passive distraction osteogenesis with distraction performed at another site of the skull. CT in group 1 patients showed inadequate bone regeneration at the distraction site causing depression of the forehead, although an adequate width of forehead expansion was achieved. Thus, additional cosmetic surgery (dermofat graft) was needed to manage the contour deformity. CT in group 2 patients showed a small-sized focal bony defect secondary to deficient bone formation; however, this defect was grossly unnoticeable, and no additional surgery was necessary. CT in group 3 and 4 patients showed a completely filled bony defect with a satisfactory forehead contour without the need for additional procedures. Although only a few

patients were examined and results were statistically insignificant, our findings are clinically significant to indicate the optimal extent of operation.

Conclusion: Expansion of the forehead width using distraction osteogenesis in patients with metopic craniosynostosis is a feasible procedure. Better results are observed in terms of bone regeneration and external contour when the dura is not detached from the frontal bone and the extent of distraction is ≤15 mm. Additional cosmetic procedures are warranted if the bony defect persists with a contour deformity.

References:

1. Selber J, Reid RR, Gershman B, et al. Evolution of operative techniques for the treatment of single-suture metopic synostosis. Ann Plast Surg. 2007;59:6–13.
2. Hormozi AK, Shahverdiani R, Mohammadi HR, Zali A, Mofrad HR. Surgical treatment of metopic synostosis. J Craniofac Surg. 2011;22:261–265.
3. Kelleher MO, Murray DJ, McGillivary A, Kamel MH, Allcutt D, Earley MJ. Non-syndromic trigonocephaly: Surgical decision making and long-term cosmetic results. Childs Nerv Syst. 2007;23:1285–1289.

Minimal-Scar Ear Reconstruction Using Endoscopic Temporalis Harvest and Thin Split-Thickness Scalp Skin Graft with Allodermis

Presenter: Jaiho Chung, MD, PhD , Profile Plastic Surgery Center, Seoul, Korea, Republic of (South)

Purpose: Ear reconstruction procedures involve both functional and aesthetic considerations. Especially, auriculoplasty requires a symmetric ear shape free of any deformities and with minimal scarring in the donor. Medpor ear reconstructions have been performed as options of atypical microtia, burned ear, bilateral microtia, etc., as rib-cartilage ear reconstruction. A key merit of the Medpor framework is that they do not cause any chest scars or deformities, which makes the operation viable for preschool children. Furthermore, endoscopic-assisted superficial temporalis fascia flap harvest requires no scalp incision. An allodermis graft with thin scalp skin can be used for the temporalis flap coverage instead of the conventional use of full-thickness skin from the lower abdomen, groin, or opposite retroauricular area. The goal of concealing scars and avoiding body deformities pose new challenges for ear reconstruction.

Materials and Methods: 142 patients underwent Medpor auricular reconstruction with endoscopic-assisted tempoparietal fascial flaps harvested using the scalp as thin split-thickness skin graft with allodermis, simultaneously from January of 2014 to December of 2017. 22 patients had undergone meatoplasty before ear reconstruction. 9 cases were bilateral microtias, 46 were atypical type microtias, and 96 were typical type microtias.

Results: No flap complications occurred except 6 traumatic Medpor exposures which could be corrected by using the deep temporal fascia flap, including partial temporalis muscle and skin graft. 3 cases involved Medpor removal due to Pseudomonas infections. Bipolar dissections of the temporal scalp flap undersurface caused 2 temporal burn alopecias. 2 cases showed skin graft donor alopecia due to mechanical problems with the equipment. After substitution of the dermatome, no further alopecia occurred.

Conclusions: Ear reconstruction by both endoscope-assisted temporoparietal fascia harvest without a superior access port and thin split-thickness (0.3–0.4 mm) scalp skin graft with allodermis can minimize scalp scarring and alopecia in addition to causing no body scars.

References:

1. John AL, Lucash RE, IM DD, Lewin SA. Pre and post-operative psychological functioning in younger and older children with microtia. *J Plast Reconstr Aesthetic Surg* 2015 Apr,68(4):492-7
2. Ray E, Wu T, Nazarion Mobin SS, Reinisch J, Urata MM. Review of Options for Burned Ear Reconstruction. *J Craniofac Surg* 2010 Jul, 21(4): 1165-9
3. Park C, Lew DH, Yoo WM. An analysis of 123 temporoparietal fascial flaps: Anatomic and clinical considerations in total auricular reconstruction. *J Plast Reconstr Surg* 1999 104: 1295-1301
4. Helling ER, Okoro, Kim G, Wang P. Endoscopic-Assisted Temporoparietal Fascia Harvest for Auricular Reconstruction. *J Plast Reconstr Surg* 2008 121(5): 1598-1605
5. Goldsztein H, Ort S, Robertson JB, Reinisch J. Scalp as Split Thickness Skin Graft Donor Site for Congenital Atresia Repair. Laryngoscope 2013(123): 496-498

The Comparison of Two Surgical Techniques for Effective Utilization of Lateral Intercostal Artery Perforator Flap in Immediately Partial Breast Reconstruction: Propeller Methos VS Turnover Method, a Single-Center Retrospective Study in Asia.

Presenter: Jae Bong Kim, MD, PhD. , Plastic and Reconstructive Surgery, Kyungpook National University Hospital, Daegu, Korea, Republic of (South)
Co-Authors: Gyu Sik Jung, MD , Plastic and Reconstructive Surgery, Kyungpook National University Hospital, Daegu, Korea, Republic of (South), Dong Kyu Kim, MD , Department of Plastic and Reconstructive Surgery, Kyungpook National University Hospital, Daegu, Korea, Republic of (South), DONG Hun CHOI, MD , Department of Plastic and Reconstructive Surgery, Kyungpook National University Hospital, Daegu, Korea, Republic of (South), Jung Dug Yang, MD, PhD , Plastic and Reconstructive Surgery, Kyungpook National University, Daegu, Korea, Republic of (South)

Background: Immediate partial breast reconstruction (IPBS) after breast-conserving surgery (BCS) has become a new paradigm in treating breast cancer.[1,2]Among the volume replacement techniques used for small to moderate-sized breasts, the perforator flap method has many advantages. Specially, breast reconstruction using the LICAP flap provided excellent cosmetic results in lateral defects where a variety of surgical methods, such as the LD flap, perforator flap, and regional flap could be used. We report usefulness of lateral intercostal artery perforator (LICAP) flap by utilizing two surgical technique and anatomic studies by using 3D-CT.

Methods: This study included 40 patients taken IPBS using LICAP flap after BCS from 2011 to 2016 at our hospital. We used 3D-CT in LICAP anatomical studies, analyzing the distribution probability of the dominant perforator and relationship with surrounding tissues. We conducted comparative analyses of the propeller method and the turnover method of LICAP flap. Patient satisfaction surveys were conducted 6 months following breast reconstruction by using our institution's Breast satisfactory survey by combining patient and three plastic surgeons.

Results: In anatomic studies of LICAP, the most dominant perforator utilizing for LICAP flaps among patients in this study were the 6thLICAP, utilized in 43.6% of cases, followed by the 7thLICAP, utilized in 39.1% of cases, and their mean distances from the latissimus dorsi and the axillary folds were determined and reported. With respect to complications, a total of 3 cases required additional treatment for fat necrosis(propeller method - 2 cases, turnover method - 1 case), and venous congestionwas found in only 2 cases that used thepropeller method. Cosmetic satisfaction was ≥90% for both techniques, indicating results that were rated as either excellent or good. reported by patients and surgeons.

Conclusion: Until now, the LICAP flap has not been widely used compared to other surgical techniques, due to limitations of flap ranges of movement and the difficulty of the surgical method.[3] But, although this study also has difficulty in representing LICAP in all cases because there is a limitation using 40 patients in single medical institution, we believe that our study results can broaden the application of partial breast reconstruction using the LICAP flap after BCS, with anatomic studies using 3D-CT, and using one of our two described surgical techniques through this study. When performing LICAP flap-based breast reconstruction, 3D-CT was useful for selection of dominant perforator in the patient before surgery and perforator dissection during surgery. And, by choosing the most appropriate of the two techniques according to the patient's situation, more satisfactory results and fewer complications can be obtained.As in this study, if 3D-CT is used to obtain perforator information sufficiently before surgery, and if the surgical methods described here are selected for the case, it is likely that the LICAP flap will become more widely used, thereby providing patients the excellent cosmetic results.

Wedge Graft: Derotational Septo-Columellar Graft

Presenter: Phillip Hyung Woo Yim, MD , Plastic Surgery, Forever Medical Group, Seoul, Korea, Republic of (South)
Co-Authors: Jinyoung Kim, MD , Plastic Surgery, Forever Medical Group, Seoul, Korea, Republic of (South), Myungjoon Lee, MD , Plastic Surgery, Forever Medical Group, Seoul, Korea, Republic of (South),
Haejin Jung, MD , Plastic Surgery, Forever Medical Group, Seoul, Korea, Republic of (South)

Purpose: Tip surgery remains the most difficult part of rhinoplasty in Asians because of the weak lower lateral cartilage characteristics and thick skin. Septal extension graft with septal cartilage or rib cartilage is the most widely used technique to lengthen the cartilagenous tip structure.[1] But in many cases, nasal tip rigidity caused by fixed graft and a small amount of septal cartilage harvest are the major drawbacks of septal extension graft.[2] Columellar strut graft is another good option of controlling tip position,[3] but it cannot provide enough projection and lengthening of the tip structure due to the tendency of a counter-clockwise rotation.[4] To avoid these shortcomings, after fixating columellar strut graft, the author inserted a piece of wedge-shaped ear cartilage graft (wedge graft) between septum and columellar to obtain a less stiff nasal tip with sufficient nasal tip elongation.

Methods and materials: To obtain proper lengthening and projection of the nasal tip, the lower lateral cartilages were released from caudal border of the upper lateral cartilages. The columellar strut, harvested from the ear cartilage, was fixed between the medial crus. A piece of remnant ear cartilage was trimmed into a wedge shape and inserted between the alar cartilages and caudal septum to add the projection and play a role of cushion buffer avoiding a counter-clock wise rotation.

Results: From April 2014 to March 2018, wedge graft was performed in 113 patients via the open nasal approach. The duration of follow-up ranged from 1 month to 3 years, with an average of 8.2 months. Excellent results were achieved in 96(85%) patients. 17(15%) patients had unsatisfactory results requiring a revision surgery because of overcorrection, or undercorrection of tip rotation, and poor tip projection.
Conclusions: Wedge graft is a simple, effective ancillary procedure for short nose correction and prevention with less post-operative nasal tip rigidity and derotation.

References

1. Seyhan, A., Ozden, S., Ozaslan, U., Sir, E. A simplified use of septal extension graft to control nasal tip location. *Aesthetic plastic surgery* 2007;31:506-511; discussion 512-503.
2. Suh, Y. C., Jeong, W. S., Choi, J. W. Septum-Based Nasal Tip Plasty: A Comparative Study between Septal Extension Graft and Double-Layered Conchal Cartilage Extension Graft. *Plastic and reconstructive surgery* 2018;141:49-56.

3. Rohrich, R. J., Kurkjian, T. J., Hoxworth, R. E., Stephan, P. J., Mojallal, A. The effect of the columellar strut graft on nasal tip position in primary rhinoplasty. *Plastic and reconstructive surgery* 2012;130:926-932.
4. Paik, M.H., Chu, L.S. Correction of short nose deformity using a septal extension graft combined with a derotation graft. *Archives of plastic surgery 2014;41:12-18.*

Microsurgical Replantation of Facial Composite Tissue

Presenter: Kwang Seog Kim, MD, PhD , Plastic and Reconstructive Surgery, Chonnam National University Medical School, Gwangju, Korea, Republic of (South)

Background: Although microsurgical replantation is an established procedure for treating avulsion or amputation of unique head parts including scalp,[1] eyelid, nose,[2] ear,[3] lip[4] and tongue,[5] there is currently no report of microsurgical replantation of substitutable facial tissues in the literature. In this report, the author presents a patient with avulsed facial composite tissue who was treated by replantation.

Methods: A 56-year-old man presented with avulsion of the left frontotemporal composite soft tissue after a traffic accident. The injury resulted in a defect measuring 6 x 8 cm and a few minor wounds on the left orbitofrontal area. The avulsed tissue was attached to the lateral orbital area by a narrow skin bridge with a width of about 0.3 cm. This connection, however, did not provide any blood flow to the avulsed tissue. Intraoperative exploration of the avulsed tissue revealed some available vessels in the wound margin, which were anastomosed in end-to-end manner to the corresponding vessels using 10-0 nylon sutures.

Results: The replanted composite tissue survived completely. The result 32 months after the operation was excellent both in aesthetic and functional terms.

Conclusions: The present case shows that microsurgical replantation of small composite tissues of the face is feasible. The author suggests that the indication spectrum for microsurgical replantation should be expanded beyond current clinical practice.

REFERENCES:

1. Miller GD, Anstee EJ, Snell JA. Successful replantation of an avulsed scalp by microvascular anastomoses. Plast Reconstr Surg. 1976;58(2):133-136.
2. Tajima S, Ueda K, Tanaka, Y. Successful replantation of a bitten-off nose by microvascular anastomosis. Microsurgery. 1989;10(1):5-7.
3. Kim KS, Kim ES, Hwang JH, Lee SY. Microsurgical replantation of a partial helix of the ear. Microsurgery. 2009;29(7):548-551.
4. Höltje WJ. Successful replantation of an amputated upper lip. Plast Reconstr Surg. 1983;73(4):664-670.

5. Buntic RF, Buncke HJ. Successful replantation of an amputated tongue. Plast Reconstr Surg. 1998;101(6):1604-1607.

The Island TRAM Flap: Modification of the Pedicled TRAM for Better Aesthetic and More Reliable Outcome

Presenter: Jung Soo Yoon, MD , Department of Plastic and Reconstructive Surgery, Hanyang University, Seoul, Korea, Republic of (South)
Co-Authors: Hee Chang Ahn, MD, PhD , Hanyang University Hospital, Seoul, Korea, Republic of (South), Jeongseok Oh, MD , Hanyang University, Seoul, Korea, Republic of (South)
Jung Woo Chang, MD, PhD , Plastic and reconstructive surgery, Hanyang University Guri Hospital, Gyeonggi-do, Korea, Republic of (South)

Purpose: The pedicled transverse rectus abdominis musculocutaneous (TRAM) flap, first described by Haratrampf in 1982, is a classic flap used for breast reconstruction.[1] It is still an effective and widely used method but has several well-documented limitations such as weak vascularity, donor-site morbidity, and natural inframammary fold disruption.[2-3] We represent the island TRAM flap to overcome these problems and obtain a better and more reliable outcome in breast reconstruction.

Methods and Materials: A retrospective chart review of patients who underwent breast reconstruction with an ipsilateral island TRAM flap was performed. In island TRAM flap, upper dissection of rectus muscle is performed at the level between the xiphoid process and costal margin. Then we resect the upper ipsilateral rectus muscle transversely surrounding the origin of superior epigastric vessels, preserving approximately 1cm of muscle strip including the vascular pedicle. After flap turnover, the inframammary fold was repaired perfectly except the small portion where the pedicle was placed. Regarding donor site closure, rectus fascia repair in the epigastric region is done meticulously to prevent exposure of sharp costal margin and epigastric dead space obliteration. Remnant lower rectus muscle was sutured to the posterior rectus sheath just above the arcuate line to reinforce the lower abdomen. Patient demographics and complications were reviewed. The aesthetic outcome, with focus on IMF, was evaluated postoperatively by photo evaluation.

Results: From January 2013 to November 2017, a total of 88 patients underwent the island TRAM flap. Etiology of the defect was breast cancer with mastectomy in 86 cases, and paraffinoma in 2 cases. 77 patients underwent unilateral reconstruction, 11 patients underwent bilateral reconstruction. Follow-up period ranged from 8 months to 53 months with a mean of 16 months. Regarding flap site complication, only minor fat necrosis occurred in 8 cases. No partial or total flap necrosis was observed. Mild inframammary bulging was observed in 5 cases, due to the loosening of the IMF suture. Only 2 patients underwent secondary operation to correct the inframammary bulging under local anesthesia. Aesthetic evaluation of the inframammary fold was performed in

55 cases, and 53 cases recieved good scores in overall aspects of continuity, definition, and symmetry.

Conclusion: Although island TRAM flaps can be technically challenging because careful dissection and pedicle identification is needed, it can provide more reliable vascularity and better aesthetic results especially regarding natural IMF without increased risk of other complications.

References:

1. Hartrampf CR, Scheflan M, Black PW. Breast reconstruction with a transverse abdominal island flap. Plast Reconstr Surg. 1982;69:216–225.
2. Buck DW 2nd, Fine NA. The pedicled transverse rectus abdominis myocutaneous flap: indications, techniques, and outcomes. Plast Reconstr Surg. 2009 Oct;124(4):1047-54.
3. Kim EK, Eom JS, Ahn SH, Son BH, Lee TJ. Evolution of the pedicled TRAM flap: a prospective study of 500 consecutive cases by a single surgeon in Asian patients. Ann Plast Surg. 2009 Oct;63(4):378-82.

Correction of Severe Sunken Upper Eyelids By Preseptal Dissection and Autologous Fat Graft during Subbrow Blepharoplasty

Presenter: Jungseok Yoo, MD , Plastic Surgery, Gangnam K-Beauty Plastic Surgery Clinic, Seoul, Korea, Republic of (South)
Co-Author: Youngwan Jin, MD, PhD , Plastic Surgery, Gangnam K-Beauty Plastic Surgery Clinic, Seoul, Korea, Republic of (South)

Purpose: Various methods have been reported to correct sunken upper eyelids during eyelid surgery for dermatochalasis. However, previous surgical methods can be limited in severe sunken upper eyelids. We introduce more effective method to correct sunken upper eyelids by subbrow blepharoplasty approach.

Methods: From January 2015 to December 2017, 78 patients underwent subbrow blepharoplasty with sunken upper eyelids correction. Autologous fat was harvested from inner thigh or submentum. After removal of the excess skin and strip excision of the orbicularis oculi muscle, the procedure involved exposing retro-orbicularis oculi fat, dissecting along the plane between orbicularis oculi muscle and orbital septum up to the designed double fold line. Slit incision was done on orbital septum at the level of supra-orbital sulcus, and then micro fat graft was placed at the posterior of orbital septum and spreading at the dissected layer between orbital septum and orbicularis oculi muscle. After skin closure, non-incision double fold procedure were done with or without ptosis correction.

Results: After 6 months of follow up, a total of 74(0.95%) were satisfied with the result. The average amount of the fat graft was 1.1cc for each upper eyelid. Only 3 patients with the asymmetric double fold eyelids underwent reoperation. The absorption rate of fat graft was relatively lower than closed fat injection procedure. None of the patients showed complications such as irregular eyelid surface, eyelids opening limitation and multiple folds.

Conclusion: Our method using autologous fat graft after preseptal dissection during subbrow blepharoplasty is simple and could be effective for the correction of severe sunken upper eyelids and blepharoptosis.

References:

1. Jung JM, Choi WS, Jo MS. Correction of the Sunken Upper Eyelid Depending on the Dermatochalasis or Blepharoptosis Using the Autologous Fat Grafting. Arch Aesthetic Plast Surg. 2014;20(3):148-154.
2. Park SK, Kim BG, Shin YH. Correction of Superior Sulcus Deformity With Orbital Fat Anatomic Repositioning and Fat Graft Applied to Retro-Orbicularis Oculi Fat for Asian Eyelids. Aesth Plast Surg. 2011;35:162–170.
3. Chen CC, Sheng NC, Chien LH. Correction of Sunken Upper-Eyelid Deformity in Young Asians by Minimally-Invasive Double-Eyelid Procedure and Simultaneous Orbital Fat Pad Repositioning: A One-Year Follow-up Study of 250Cases. Aesthetic Surgery Journal. 2015;35(4)359–366.

Efficacy of Kinesio – Tape in the Early Postoperative Period

Presenter: Phillip Hyung Woo Yim, MD , Plastic Surgery, Forever Medical Group, Seoul, Korea, Republic of (South)
Co-Author: Jinyoung Kim, MD, Plastic Surgery, Forever Medical Group, Seoul, Korea, Republic of (South)

Purpose: Kinesio taping (KT) is used worldwide to prevent and treat musculoskeletal injuries. [1] The aim of the present study was to investigate whether the application of elastic therapeutic tape (Kinesio Tape [KT]) prevents or decreases bruises, swelling, and pain after aesthetic surgery, thus improves patients' postoperative morbidity.

Materials and Methods: To address the research purpose, the investigators designed and implemented an open-label, monocentric, parallel-group, and randomized clinical trial. KT was applied directly after surgery and maintained for 10 days postoperatively. Sham therapy was administered to the contralateral side. Patient surveys and physician ratings were obtained based on photographic evaluation of bruises, swelling, and pain. Three physicians submitted ratings, and these ratings were assessed for interobserver reliability. Additional ex vivo model to evaluate the bruise healing effect of KT in 12

Sprague-Dawley male rats was developed. After bruise induction, histological sections from tissue specimens of paravertebral full-thickness skin were stained by hematoxylin and eosin, and evaluated during the first five days after surgery.

Results: The study included 231 patients (187 females and 34 males; mean age, 39.5 yrs). Application of KT after surgery had a statistically significant influence on tissue reaction and swelling, decreasing the incidence of swelling and turgidity by more than 50% during the first 2 days after surgery. Although KT had no significant influence on pain control, patients in the KT group perceived significantly lower morbidity. In bruise-induced rat model, histological evaluation revealed that the microcirculation of injured subcutaneous tissue was accelerated from the first day after KT application.

Conclusion: The present results showed that KT after surgery is a simple, less traumatic, and effective approach for managing postoperative bruise, swelling, and pain that are free from systemic adverse reactions, thus enables early return to normal daily life.

Reference:

1. Thelen, M. D., Dauber, J. A., Stoneman, P. D. The clinical efficacy of kinesio tape for shoulder pain: a randomized, double-blinded, clinical trial. *The Journal of orthopaedic and sports physical therapy* 2008;38:389-395.

Various Approaches Including Novel Nano/Microtechniques to Reduce Silicone Implant-Induced Contracture with Adverse Immune Responses

Presenter: Shin Hyuk Kang, M.D., Department of Plastic and Reconstructive Surgery, Chung-Ang University Graudate School, Seoul, Korea, Republic of (South)
Co-Authors: Byeong Ho Lee, M.D. , General medicine, Hwaseong City Public Health Center, Gyeonggi-do, Korea, Republic of (South); Joon Hyung Park, M.D., General medicine, Yangpyeong-gun public health care center, Yangdong health center branch, Gyeonggi-do, Korea, Republic of (South); Hansoo Park, PhD , School of Integrative Engineering, Chung-Ang University, Seoul, Republic of Korea, Seoul, Korea, Republic of (South), Woo Seob Kim, MD, PhD , Department of Plastic and Reconstructive Surgery, Chung-Ang University Hospital, Seoul, Korea, Republic of (South)

To date, a wide variety of studies has investigated the reduction of capsular contracture caused by silicone implants. However, complications caused by silicone implants remain unresolved. Researchers are attempting to reduce these complications. Studies focusing on developing implant surfaces similar to human tissues are of particular importance. A physiological ECM-like surface reduces inflammatory foreign body reactions and modulates the immune response. The plastic and reconstructive surgery fields have significantly benefited from nano/microtechnology in cosmetic

dermatological applications, wound healing, implant and prosthesis development, tissue engineering and regenerative medicine, and drug delivery materials. In particular, the development of materials has evolved due to nano/microtechnology that enables the analysis of material surface topography. Recently, a novel implant technology utilizing various nano-/micro-engineering techniques has emerged. Development of implants using these new technologies would allow increasingly natural interactions between the implants and surrounding tissues, which would reduce the peri-implant inflammatory response in the clinic and the induction of chronic inflammation in cells and tissues. Although no clinical long-term follow-up results on these implants have been reported, novel implant surfaces with improved interactions with surrounding tissues may reduce the risk of capsular contracture and should improve the results in anaplastic large cell lymphoma. In the field of plastic and reconstructive surgery, the nano/microtechnology that develops more advanced biocompatible implant will continue to grow and expand, and continued research is needed on new biomaterials that mimic human tissues.

The present article provides an overview of the currently available techniques, including systemic drugs, topical application, autologous tissue, acellular dermal matrix, surface type and novel nano/microtechniques, to reduce silicone implant-induced contracture and associated foreign body responses.
The novel approaches of nano/microtechnology being applied in breast implant develpoment such as nano/microtopographies induce favorable biointegration and enhance biocompatibility. Surface modification with nano/microtopographies integrated controlled-release antimicrobial or anti-inflammatory agents potentially could reduce capsular contracture. Nanoscale architecture could alter the body’s immune response to the breast implant or minimize biofilm formation and affect the subsequent degree of capsular contracture. This can lead to the development of permanently implantable materials with immunologically inactive nano-engineered surface. Furthermore, in the near future, nano/microelectromechanical devices and breast cancer cell specific proteins integrated with novel implants could be used to detect cancer cells, cancer recurrence and treat pathologic cells.

Is the Licox PtO2 System Reliable for Free Flap Monitoring? Comparison between Two Cohorts of Patients

Presenter: Chiara Stocco, MD, Plastic and Reconstructive Surgery Unit, Department of Medical, Surgical and Health Sciences, University of Trieste, Italy, Trieste, Italy,
Co-Authors: Vittorio Ramella, MD , Plastic and Reconstructive Surgery Unit,, Department of Medical, Surgical and Health Sciences, University of Trieste, Italy, Trieste, Italy, Giovanni Papa, MD, PhD , Plastic and Reconstructive Surgery Unit, Department of Medical, Surgical and Health Sciences,University of Trieste, Italy, Trieste, Italy, Federico Cesare Novati, MD , Plastic and Reconstructive Surgery Unit, Department of Medical, Surgical and Health Sciences, University of Trieste, Italy, Trieste, Italy,

Sara Leuzzi, MD , Plastic and Reconstructive Surgery Unit, Department of Medical, Surgical and Health Sciences, University of Trieste, Italy, Trieste, Italy, ,Zoran Marij Arnez, MD, PhD , Plastic and Reconstructive Surgery Unit, Department of Medical, Surgical and Health Sciences, University of Trieste, Italy, Trieste, Italy

Background: Flap failures can derive from arterial or venous occlusion due to thrombosis, external compression, vessel kinking, or hematoma, etc. Any delay between the detection of flap compromise and surgical re-exploration significantly decreases the free flap salvage rate. Free Flap monitoring is crucial for early recognition of vascular complications. Licox® PtO2 is a minimally invasive monitoring system for continuous measurement of tissue oxygen tension in all types of free tissue transfers. Our study compares two consecutive series of patients undergoing microsurgical reconstruction monitored with standard clinical bedside surveillance and with the Licox® PtO2 system regarding flap loss and flap salvage, sensitivity, and specificity.

Methods: We performed a prospective study of all patients undergoing microsurgical reconstructions between 2016 and 2017. Group 1 included 43 patients that underwent standard clinical bedside postoperative flap monitoring while group 2 included 44 consecutive patients also monitored with Licox® PtO2 system.

Flap complications such as return to theatre for vascular compromise, partial and total flap loss and flap salvage rate were analyzed. We performed the re-exploration of the flap in group 2, when the PtO2 values continuously dropped for at least 50% of their original value in 30 minutes or reached levels lower than ten mmHg while in group 1, clinical signs of arterial/venous compromise had to be present.

Differences in categorical data were analyzed using Chi-square test or Fisher's exact test when appropriate. Differences were considered significant if P-value was <0.05. Statistical analyses were carried out using software R (the R Foundation for Statistical Computing; Version 3.3.2, 2016).

Results: Between 2016 and 2017, we performed 87 microsurgical flaps. We monitored 43 free flaps with clinical assessment (group 1) and 44 with the Licox® PtO2 system (group 2). We used different types of free flaps for breast, head and neck, lower limb and genital reconstruction (DIEP, mSAP, ALT, fibular flap, LD, TFL, RFFF, UFFF).

We noticed no significant difference between the two groups regarding the rate of vascular complications (p=0.31) return to the theatre (p=0.31), flap salvage (p=0.9), total and partial flap loss (p=0.49 and 0.36 respectively). We recorded a total of 10 vascular complications: 6 in group 1 and 3 in group 2.

When analyzing the Licox® PtO2 system monitoring group, we documented six false-positive results (13.6%) and 0 false negatives with an accuracy of 0.86, a sensibility of 1.00 and a specificity of 0.85 (with positive and negative predictive value of 0.33 and 1.00 respectively).

Conclusions: Licox® PtO2 system detects early postoperative circulation problems in all types of free microvascular flaps, including buried and bone ones. The high sensitivity of this method gives a promising safety profile when the values remain stable without any alarm signal. Its lower specificity (high percentage of false-positive results) requires additional clinical monitoring; this could be related to the lack of precise guidelines regarding the probe insertion (the distance from the perforator etc.). To date, in our experience, it can be used as a useful supplement to clinical bedside observation of free flaps because of its low specificity.

Hidradenitis Suppurativa Surgical Treatment: Our 20 Years Experience

Presenter: Gabriella Cassotta, MD , Plastic Surgery, IDI of Rome, Rome, Italy
Co-Authors: Rosaria Laporta, MD PhD , Plastic Surgery, IDI of Rome, Rome, Italy, Mauro Barone, MD , Plastic Surgery, Campus Bio Medico of Rome, Rome, Italy, Paolo Persichetti, MD PhD , Plastic Surgery, Campus Bio Medico of Rome, Rome, Italy, Alessio Caggiati, MD PhD , Plastic Surgery, IDI of Rome, Rome, Italy

Introduction: Hidradenitis suppurativa surgical treatment is referred to patients who cannot be assisted by medical, local e nutritional therapy. Plastic and reconstructive surgical procedures aim to limit, in an aesthetic/reconstructive point of view, scars and their visibility even in case of minimum demolition, according to the mean young age of the patients.

Materials and Methods: Inclusion criteria: all patients affected by diagnosed Hidradenitis suppurativa not controlled by pharmacological therapy, patients with age > 14 years old, patient who signed informed consent, patients treated at our department. We applied the BODY-Q sexual function post-operative module and satisfaction with outcome post-operative module. The sample was studied about age, BMI, comorbidity, bariatric surgical procedures, follow up, type of surgical procedure, complications and secondary procedures.

Experience: In the last 20 years, we treated 195 patients, with mean age of 32 years old, with mean follow up of 2 years. Surgical treatment was considered in case of: nodular and/or abscessual singular recurrent form, nodular confluent abscessual form, sub-total or total aesthetic units extended form, extended genital form. Treatment of a singular lesion consisted of a demolitive excision extended to the inflammatory region next to the primary site of the pathology. Fistulography using methylene blue sometimes could be performed to obtain a complete removing of the fistula. Scars usually should follow minor tension lines of the body or could be done into cutaneous natural sulcus or plica to optimize aesthetic results. Multiple confluent nodular lesions must be removed by extended demolitive surgery followed by reconstructive strategy using local or loco-regional cutaneous flaps. Loco-regional cutaneous flaps sometimes were preferred by

the reconstructive surgeon, even if they cause poor aesthetic results, because they are adjacent to the lesions and less involved in an inflammatory process which could cause recurrence. Nodular confluent abscessual form, which involves sub-total or total aesthetic units, is treated by removing all the interested area (axilla and groin); it is necessary to consider a reconstructive strategy in this case harvesting loco-regional cutaneous flaps which allows a huge transposition of healthy tissue limiting the scars into natural sulcus. Extended nodular/abscessual genital form usually showed local infections which causes emotional and sexual discomfort; immediate reconstruction is preferred in order to use technique based on
harvesting pedicled or perforator island flaps. It is possible to obtain excellent aesthetic and functional results using, for selected patients, common aesthetic procedure as abdominoplasty, thigh lift or mammaplasty. In case of severe extended anatomic region involved by hidradenitis suppurativa, for example the gluteal region, it is possible to follow a flowchart: total excision of the lesion or the involved region, therapy ex- vacuum (VAC Therapy), healing by secondary intention and/or by using skin grafts in a selected cases similar to the treatment of II and III degree burned patients.

Results: From BODY-Q questionnaire the group of patient with severe hidradenitis suppurativa had the highest level of post-operative satisfaction.

Conclusions: Considering age, sex, functional and relational discomfort and aesthetic outcomes according to the stage of disease, it is possible to get the best surgical strategy.

Timing and Outcome Comparison in Lower Limb Open Fractures: The Patient Perspective and Impact on Hospital Management

Presenter: Chiara Stocco, MD , Plastic and Reconstructive Surgery Unit, Department of Medical, Surgical and Health Sciences, University of Trieste, Italy, Trieste, Italy
Co-Authors: Silvia Galici, MD , Plastic and Reconstructive Surgery Unit, Department of Medical, Surgical and Health Sciences, University of Trieste, Italy, Trieste, Italy, Vittorio Ramella, MD , Plastic and Reconstructive Surgery Unit, Department of Medical, Surgical and Health Sciences, University of Trieste, Italy, Trieste, Italy, Giovanni Papa, MD, PhD , Plastic and Reconstructive Surgery Unit, Department of Medical, Surgical and Health Sciences,University of Trieste, Italy, Trieste, Italy, Sara Leuzzi, MD , Plastic and Reconstructive Surgery Unit, Department of Medical, Surgical and Health Sciences, University of Trieste, Italy, Trieste, Italy, Zoran Marij Arnez, MD, PhD , Plastic and Reconstructive Surgery Unit, Department of Medical, Surgical and Health Sciences, University of Trieste, Italy, Trieste, Italy

INTRODUCTION: The treatment of Lower Limb Open Fractures (LLOF) represents a critical challenge, as their management is related to a high incidence of complications. The aim of the study was to compare two groups that underwent LLOF reconstruction: one treated in the acute phase and one in the sub-acute period. The primary outcomes compared flap and limb complications, time to bone union, time to full weight bearing, number of secondary procedures, while the secondary outcome assessed the quality of life.

MATERIALS AND METHODS: A single-center retrospective study at the Plastic and Reconstructive Surgery Department of Trieste, from January 2008 to May 2017 was conducted; all patients suffering from LLOF that needed a debridement, bone fixation and reconstruction with a free flap were included. Two groups were identified: group 1 (within seven days from injury) and group 2 (beyond seven days). The compared outcomes were free-flap survival, complication rate, number of secondary procedures, time to bony union and time until full-weight bearing [tab1-2]. In addition, one year after surgery all patients were given the Lower Extremity Functional Scale (LEFS) and the 36- Item Short Form Survey (SF-36) for evaluation of the post-trauma/post-surgery.

RESULTS: 25 consecutive patients from January 2007 and May 2017 were analyzed. The mean follow-up was 3 years. There were 4 GAIIIC, 15 GA IIIB, 6 GA IIIA injuries and 11 type 2, 5 type 1, 4 type 3 and 2 type 4 degloving injuries. In Group 1, 12 open fractures were reconstructed by a free-flap transfer while 13 patients had free-flap coverage in group 2. Free flap success rate was 100%. We recorded 41.7% complications in group 1 and 15.4% in group 2 with no statistically significant difference (p=0,20). In group 1, 3/12 patients (25%) needed a secondary surgical procedure while 3/13 (23%) in group 2 with no statistically significant difference (p=0,9). The mean flap dimensions were 187cm2 in group 1, vs 89 cm2 in group 2. In the LEFS score a statistically significant difference was found group 1 LEFS=56.0, group 2 LEFS=74.5, (p=0,02). The results of the SF-36 showed that patients were more satisfied with their functional results in the Group 2 score= 0.98 vs. group 1 score=0.70 (p=0,007). The physical limitations were more frequently present in group 1 (score=0.63) vs. group 2 (score=1.00) (p=0,01).

CONCLUSIONS: Despite the advantages of early reconstruction are related to the concept of coverage before bacterial proliferation, modern advancements in wound management with negative pressure therapy have reassessed the concept of urgency in treatment of LLOF, as it allows a sterile sealing of the soft tissue defect after debridement, it enhances the granulation tissue formation and can lead to a coverage with a flap of smaller dimension; it gives the surgeon the possibility of a better hospital management with the dedicated surgical team in a dedicated Operating Room during the working hours. Moreover, the LEFS and SF-36 questionnaires showed an increased satisfaction regarding functional results, suggesting that a better consciousness of what is happening might influence the patients' perspective and recovery.

Comparative Study Using Different Techniques in Treatment of Severe Gynecomastia after Massive Weight Loss: Analysis of Long-Term Outcomes with Italian Version of Body-Q

Presenter: Mauro Barone, MD , Plastic Surgery, Campus BioMedico University of Rome, Rome, Italy
Co-Authors: Annalisa Cogliandro, MD, PhD , Campus BioMedico University of Rome, Rome, Italy, Rosa Salzillo, MD , Plastic, Reconstructive and Aesthetic Surgery Department, Campus Bio-Medico University of Rome, Rome, Italy,
Marco Morelli Coppola, MD , Plastic, Reconstructive and Aesthetic Department, Campus Bio-Medico University of Rome, Rome, Italy, Silvia Ciarrocchi, MD , Plastic, Reconstructive and Aesthetic Department, Campus Bio-Medico University of Rome, Rome, Italy, Beniamino Brunetti, MD PhD , Plastic, Reconstructive and Aesthetic Surgery Department, Campus Bio-Medico University of Rome, Rome, Italy. Stefania Tenna, MD PhD , Plastic, Reconstructive and Aesthetic Department, Campus Bio-Medico University of Rome, Rome, Italy, Paolo Persichetti, MD PhD , Plastic, Reconstructive and Aesthetic Surgery Department, Campus Bio-Medico University of Rome, Rome, Italy

Introduction: The aims of this study are: 1) analysis of long-term outcomes of correction of severe gynecomastia with different technique; 2) Apply the italian version of BODY-Q; 3) Present the role of intercostal perforator flap (ICAP) after massive weight loss for correction of severe gynecomastia.

Materials and Methods: The study population consisted of men who had undergone correction of severe gynecomastia. Between January 2008 and March 2018, we performed surgical correction of bilateral severe gynecomastia in 80 men (160 breasts) following massive weight loss. Patients answered the Italian version of BODY-Q post-operative satisfaction chest module. We administered the questionnaire electronically almost 1 year after surgery for each procedure. Patients were divided into three groups: 1) Adenomammectomy with circumareolar scar, 2) Adenomammectomy with inframammary fold scar, 3) Adenomammectomy with inframammary fold scar using ICAP flaps.

All patients had experienced substantial weight loss (> 30 kg) and presented with bilateral severe tissue ptosis of the breast, follow up almost of 2 years,had a good understanding of the Italian language, and signed consent were included in the study. We excluded all patients with weight loss less than 30 kg, patients with unstable weight, heavy smokers, drug-addicted patients, and those without severe gynecomastia or breast severe ptosis. The sample was studied about age, BMI, comorbidity, bariatric surgical procedures, follow up, type of surgical procedure, complications and secondary procedures.

Results: We performed 487 severe gynecomastia correction from 2008 to 2018; 80 patients adhered to the inclusion criteria and formed our study group. This cross-

sectional study compared three cohorts in which 52 with circumareolar scar, 18 with inframammary fold scar, 10 with inframammary fold scar using ICAP flaps. Secondary procedures in group one were 16, in group two were 2, in group three was 1. We compared the secondary procedures of group 1 with the other groups and we obtained a significance difference with a P=0,04. The average time between the surgical procedure and completing the questionnaires was 12 months. The mean patient age was 36.5 years, and the average body mass index was 27.5 kg/m^2 at the time of surgical correction of gynecomastia. In all patients, severe breast ptosis was associated with significant skin laxity in the upper abdominal wall. Sleeve gastrectomy had been performed in 32 patients, biliopancreatic diversion in 16 patients, and gastric bypass in 32 patients. The average weight loss was 48 kg. From the BODY-Q analysis, the group of patients undergoing Adenomammectomy with inframammary fold scar using ICAP flaps has achieved significantly better results regarding the satisfaction with chest, psychosocial function, satisfaction with outcome and better body image.

Conclusions: This is the first study which used BODY-Q to analyze the correction of severe gynecomastia following massive weight loss with long-term results. The use of this patient-reported outcome measure underlined that the intercostal artery perforator flap, used in the correction of severe gynecomastia following massive weight loss, is a safe and effective technique with good outcomes and high patient satisfaction.

Medial Femoral Condyle Free Flap in Head and Neck Reconstruction

Presenter: Elena Lucattelli, MD , Plastic, Reconstructive and Microsurgery, University of Florence, Prato, Italy

Introduction: Free flaps are considered the best reconstructive technique for bony defects in the head and neck. For larger defects (> 5 cm) the most popular free flaps are fibula, scapula and iliac crest. For smaller defects (<3-4 cm) non-vascularized bone graft are a good reconstructive option, if the vascularization of the recipient site is not compromised. Our goal was to demonstrate how the MFC (Medial Femoral Condyle) free flap is a valid reconstructive technique for small defects, when the recipient site was compromised by previous surgical procedures, infection and/or radiotherapy.

Material and Methods: Between October 2012 and June 2017, 12 patients underwent reconstruction of defects of the head and neck with microvascular MFC. The recipient sites were the mandible (4), the maxillary bone (3), the palate (1), the nasal septum (3) and the skull bone (1). Cortico-periosteal and cortico-spongious free flaps were harvested, with an average size of 6,8 cm^2.

Results: At one-year follow-up, the functional and aesthetic results were assessed as good or very good. In all cases it was possible to faithfully fill the cervical-facial defect. We had only two complications: flap necrosis in one patient and a donor site persistent hypesthesia in another case.

Conclusions: In our experience, the MCF free flap demonstrated high versatility with a low donor site morbidity. We can assert that MFC flap is a new and refined technique for reconstructing small defects in poorly vascularized transplant recipient sites in the head and neck district.

Complex Scalp and Skull Reconstruction: A Reconstructive Algorithm

Presenter: Giovanni Zabbia, MD , Plastic and Reconstructive Surgery, University of Palermo, Palermo, Italy
Co-Authors: Francesca Toia, MD , Plastic and Reconstructive Surgery, University of Palermo, Palermo, Italy, Roberto Pirrello, MD , Plastic and Reconstructive Surgery, University of Palermo, palermo, Italy, Matteo Rossi, MD , Plastic and Reconstructive Surgery, University of Palermo, palermo, Italy, Luciano Mangiameli, MD , Plastic and Reconstructive Surgery, University of Palermo, palermo, Italy, Adriana Cordova, US , Plastic and Reconstructive Surgeryvia, University of Palermo, palermo, Italy

INTRODUCTION: We present a case series and a reconstructive algorithm for complex scalp and skull reconstruction.

MATERIALS: We retrospectively evaluated patients operated between 2010 and 2017 for large defects of the scalp or combined skull defects (skin + bone ± dura mater). Data on defect etiology, size and location, type of reconstruction, early and long-term complications and functional and aesthetic outcomes were extrapolated. A reconstructive algorithm was elaborated based on study results.

RESULTS: Most of the 24 cases were oncological (59%). A bone defect was present in 68% and a dura mater defect in 14% of cases. All patients underwent microsurgical reconstruction. Muscle free flaps were used in all but one case. Vascular grafts were rarely needed (1/24). Complications included 1 flap failure and 2 post-operative infections (conservately solved).

Muscle-sparing harvesting technique and post-operative muscle atrophy allowed for a good aesthetic result and adequate flap thickness, also for the frontal region. The average follow-up was 27 months.

The following reconstructive algorithm is suggested:

- SKIN: Muscle-sparing vastus lateralis flap as first choice

    - BONE:
        - No bone reconstruction for defect with larger diameter < 3-4 cm
        - no reconstruction/autologous bone graft for defect with larger diameter 4-10 cm for forehead/occipital region.
        - synthetic implant for larger diameter > 10 cm.

    - If infection, bone reconstruction delayed 3-6 months.
- DURA MATER:
    - suture approximation if possible.
    - syntetic patch or fibrin glue (non-irradiated patients)
    - vascularized fascia (irradiated patients)

CONCLUSION: Complex scalp and skull defect generally require microsurgical reconstruction. Muscle flaps guarantee a reliable coverage for primary or delayed bone reconstruction, and a good aesthetic outcome. The vastus lateralis flap is often indicated due to its large size, long pedicle, and functional and aesthetic outcomes. Bone reconstruction is indicated in selected cases, as muscle flaps allow valid protection of deep structure.

Impact of Implant Surface on the Development of Bacterial Biofilm on Mammary Implants: Results of an i*n Vitro* Analysis.

Presenter: Alberto Bolletta, MD , Department of Plastic and Reconstructive Surgery, University of Sassari, Sassari, Italy
Co-Authors: Giulia Ganau, PhD , Microbiology and Immunology Unit, University of Sassari, Sassari, Italy, Luca Fiorot, MD , Department of Plastic and Reconstructive Surgery, University of Sassari, Sassari, Italy, Gian Vittorio Campus, MD, Professor , Department of Plastic and Reconstructive Surgery, University of Sassari, Sassari, Italy, Antonio Bulla, MD, PhD , Department of Plastic and Reconstructive Surgery, University of Sassari, Sassari, Italy

Background: Capsular contracture is an important complication after breast surgery involving implants. The etiology of capsular contracture is multifactorial and remains unclear. Recent evidence suggests that bacterial biofilm on the implant surface may be a determinant factor in developing capsular contracture. On the other side, texturization of the surface of implants has been a major improvement in reducing capsular contracture. In this scenario, the authors decided to investigate, in vitro, the relationship between biofilm formation and surfaces of the implants by analyzing the rate of bacterial growth and adhesion to different implant surfaces.

Methods: Multiple 1.5 cm2 samples of four differently surfaced implants (smooth, micro-textured and two macro-textured implants from different manufacturers) were inoculated with 6 different human strains of Staphylococcus epidermidis isolated on infected breast implants explanted in our Plastic Surgery Unit. The bacterial cultures were grown at 37 °C in TSB culture media. The samples underwent both quantitative bacterial analysis (O.D. 600nm) and imaging using scanning electron microscopy. Paired Student’s T-test was used to calculate whether the number of bacteria attached among the different implant surfaces were statistically significant. A two-tailed p value of < 0.05 was considered significant.

Results: Our analysis showed that the difference in number of bacteria attached to the macro-textured samples compared with micro-textured was statistically significant ($p < 0.05$). On the other hand, the difference between micro-textured and smooth implants was not statistically significant ($p > 0.05$). These findings were confirmed by imaging analysis. Scanning electron microscopy showed denser biofilm on the surface of macro-textured implants compared with micro-textured and smooth implants. In addition, there was a difference among the different bacteria strains analyzed. One strain demonstrated high capability of forming biofilm both on macro-textured, micro-textured and smooth implants with no significant difference between the different surfaces.

Conclusions: These results suggest that macro-textured implants may be more prone to host biofilm forming bacteria in comparison with micro-textured and smooth implants. From our findings micro-textured implants behave similarly to smooth implants. The limit of our study is that it was conducted only in vitro. Moreover, we found that certain strains manifested high capability of adherence on every surface analyzed. Further in vivo studies are necessary to clarify the clinical implication of our experimental results, both in preventing implant infection and capsular contracture.

Negative-Pressure Wound Therapy in the Prevention and Management of Complications from Prosthetic Breast Reconstruction: A Systematic Review

Presenter: Hsu-Tang Cheng, MD , Plastic and Reconstructive Surgery, Asia University Hospital, Taichung City,, Taiwan
Co-Author: Tony Chieh-Ting Huang, MD, MSc , Plastic Surgery, Mayo Clinic, Rochester, MN

Aim: To analyze the outcomes from the use of negative-pressure wound therapy (NPWT) in the prevention and management of complications from prosthetic breast reconstruction.

Method: A systematic review of literature was conducted by using PubMed-MEDLINE for key words: negative pressure wound therapy, breast reconstruction, and prosthesis

Results / Discussion: Eight studies with a total of 72 patients undergoing prosthetic breast reconstruction with breast implants or tissue expanders were included. In preventing breast wound complications, there is one case control study using Incisional NPWT (-125 mmHg) after immediate expander-based breast reconstruction for 3 days. The overall mastectomy flap necrosis rate was lower (8.9% vs 23.5%) compared to the conventional dressing group. Another case series also demonstrated good outcome with 24/25 (96%) breasts achieved healing. In the management of nipple-areolar

complex (NAC) venous congestion, one case report demonstrated 85% rescue of NAC after using NPWT (- 75 mmHg) for a total of 12 days. In the management of peri-prosthetic infections, two case series used NPWT with instillation. It accelerated the treatment of the infections and maintained the breast cavity for future reconstruction. Conventional NPWT also showed good salvage outcome in three case reports.

Conclusion: NPTW in prosthetic breast reconstruction may be a promising management showing beneficial results with low risk of complications. However, low methodologic quality of included studies limits recommendations for NPWT as the standard of practice. Additional high-quality trials are warranted to corroborate the findings of this systematic review.

A Paper-Supported Aptasensor Based on Upconversion Luminescence Resonance Energy Transfer for the Accessible Determination of Exosomes

Presenter: Xiaosong Chen, MD, PHD , Plastic Surgery, Fujian Medical University Unin Hospital, Fuzhou, China

Exosomes, as potential cancer diagnostic markers have received close attention in recent years. However, there is still a lack of simple and convenient methods to detect and quantitate exosomes. Herein, we used a simple paper supported aptasensor based on luminescence resonance energy transfer (LRET) from up conversion nanoparticles (UCNPs) to gold nanorods (Au NRs) for the accessible determination of exosomes. When exosomes are present, the two sections of the aptamer can combine with the CD63 protein on the surface of exosomes and form a conjugation to close the distance between UCNPs and Au NRs, which initiates the LRET and promotes luminescence quenching. These variations can be monitored by the homemade image system, and the green channel intensities of obtained colored images were extracted with photoshop software to quantify the luminescence. As a result, the quenching of the luminescence of the UCNPs is linearly correlated to the concentration of the exosomes (in the range of 1.0 °¡ 104 ~ 1.0 °¡ 108 particles/μL), enabling the detection and quantification of the exosomes. Such approach can reach a low detection limit of exosomes (1.1 °¡ 103 particles/μL) and effectively reduce the background signal by using UCNPs as a luminescent material. This study provides an efficient and practical approach to the detection of exosomes, which should lead to point-of-care testing in clinical applications.

Poldimethylsiloxane(PDMS) Surface Modification with Itaconic Acid for Developing Biocompatible Hydrophilic Materials

Presenter: Shin Hyuk Kang, M.D. , Department of Plastic and Reconstructive Surgery, Chung-Ang University Graudate School, Seoul, Korea, Republic of (South)
Co-Authors: Myoung Je Song, M.D. , General medicine, Anseong-si public health care center, Gyeonggi-do, Korea, Republic of (South), Chan Yeong Heo, M.D., Ph.D. , Plastic and Reconstructive Surgery, Seoul National University Bundang Hospital, Seongnam-Si, Korea, Republic of (South), Hansoo Park, PhD , School of Integrative Engineering, Chung-Ang University, Seoul, Republic of Korea, Seoul, Korea, Republic of (South)

Silicone has been used widely in medicine for the last 70 years, with the first implant placed in humans in 1946 for duct repair during biliary surgery. However, silicone implants have been associated with a number of risks and complications, which has significantly limited their application. The PDMS surface is the possibility of bacterial attachment, leading to the formation of biofilms such as capsular contracture (CC) – an excessive foreign body reaction that forms a tight and hard fibrous capsule around the silicone implant, which is experienced by up to 50 percent of patients after breast augmentation and reconstruction. Furthermore, anaplastic large cell lymphoma (ALCL) is a very rare breast implant-associated T-cell lymphoma that is CD30+ and anaplastic lymphoma kinase (ALK) negative. This disease is now widely recognized and there is an increased public awareness of the association between breast implants and the development of ALCL, a rare form of non-Hodgkin's lymphoma after warnings were released from the U.S. Food and Drug Administration on January 26, 2011. Therefore, the development of novel silicone implants with anti-inflammatory, anti-fibrosis and anti-protein functionality products is necessary to prevent adverse immune response on silicone implants. The present study provides an overview of the currently available techniques, including novel nano/microtechniques, to reduce silicone implant-induced contracture and associated foreign body responses. In addition to this, we present the novel method for improving its anti-inflammatory, anti-fibrosis and anti-protein functionality. We conjugated the PDMS surface with itaconic acid (IA), and IA conjugated gelatin polymer (IA-GTpoly) via a chemical method. The PDMS surfaces conjugated with IA and IA-GTpoly via a chemical method better-prevented protein adsorption than the bare PDMS. IA and IA-GTpoly conjugated PDMS surfaces did not show cytotoxicity. The IA (150 mmol)-conjugated PDMS and IA-GTpoly (0.25 & 0.50 wt%)-conjugated PDMS surfaces showed lower inflammation than the bare PDMS. The in vivo capsule thickness of IA (150 mmol)-conjugated PDMS and IA-GTpoly (0.25 & 50 wt%)-conjugated PDMS surfaces showed significantly lower than the bare PDMS. More importantly, after 8 weeks, the lowest capsule thickness was explicitly found for IA-GTpoly (0.50 wt%)-conjugated PDMS surface. The collagen density of IA (50 & 150 mmol)-conjugated PDMS and IA-GTpoly (0.25 & 50 wt%)-conjugated PDMS surfaces showed significantly lower than the bare PDMS. Importantly, after 8 weeks, the less collagen density found for IA-GTpoly (0.50 wt%)-conjugated PDMS surface. In the case of myofibroblast, a significant decrease was observed in the IA (150 mmol)-conjugated PDMS and IA-GTpoly (0.50 wt%)-conjugated PDMS surfaces compared to the bare

PDMS. Notably, only a small amount of myofibroblast was observed in IA (150 mmol)-conjugated PDMS and IA-GTpoly (0.50 wt%) PDMS surfaces at 8 weeks. The hydrophilic polymer materials conjugations used on these silicone implants demonstrate significant potential for preventing capsular contracture and developing biocompatible hydrophilic materials for various biomedical applications.

Microsurgical Approach for Early Excision of Neurofibroma in the Head and Neck Areas

Presenter: Cho-Han Bicon Wu, MD , Department of Plastic and Reconstructive Surgery, China Medical University, Taichung, Taiwan
Co-Author: Hung-Chi Chen, MD, PhD, FACS , Department of Plastic and Reconstructive Surgery, China Medical University, Taichung, Taiwan

BACKGROUND: Neurofibroma has a variety of manifestations. The major complications are deformities with overgrowth of bone and malignant changes. Repetitive surgeries are necessary for recurrent neurofrbromas in head and neck area. In the past, facial nerve palsy was often observed after surgery. Because of the development of reconstructive microsurgery, anesthesiology, pediatrics and pediatric ICU care, early surgical intervention has been advocated to minimize the progressive development of facial deformities and to preserve facial nerve function.

PATIENTS AND METHODS: A retrospective study was done for a total of 9 patients with neurofibromatosis type I in head and neck area. The age to start surgical intervention was from 2 months to 67 years. The mean follow-up time was 38 months (2months to 8 years). Serial pictures, image study and facial expressions were record.

RESULTS: (1) For facial contour, early and multiple surgical interventions could avoid severe asymmetry as well as distortion of mandible which are difficult to correct, in contrast to the patients operated late. (2) For the facial nerve function, maximal tumor excision and identification of facial nerve with microscope can reduce tumor-compression injury and result in better facial expression.

CONCLUSION: Close observation and early operation for neurofibroma will be the tendency of treatment in the future. If necessary, repetitive operation can be done with guidance of suture marked around the facial nerve branch.

Non Visualised Sentinel Lymph Nodes on Lymphoscintigraphy: Why Size Matters

Presenter: Shane Carr, MD , Plastic Surgery, Galway University Hospital, Galway, Ireland

Introduction: Failure of sentinel lymph node visualisation on lymphoscintigraphy for melanoma has been reported to occur at rates of 1-3% [1,2]. A variety of reasons for failure of uptake have been implicated [3], including but not limited to technical error.

Aim: To measure compliance with existing nuclear medicine guidelines and to identify the rate of and factors relating to non visualisation of sentinel lymph nodes on lymphoscintigraphy.

Methods: A retrospective review of the 12 months preceding the audit start date was carried out to determine the initial rate of non-visualisation of sentinel lymph nodes on lymphoscintigraphy. A prospective single institution closed loop audit was carried out over a 6-month period. Identification of factors that may be contributing to non-visiualisation of sentinal lymph nodes was undertaken. Interventions for improvement in practice were instituted after the first 3 months of audit. The impact of implemented interventions was then audited over the following 3-month period.

Results: 12/59 patients (20%) undergoing sentinel lymph node biopsy had failure of visualisation on lymphoscintigraphy during the retrospective study period. 1/11 (9%) of patients had failure of sentinel lymph node visualization during the initial audit period, improved to 0/11 following several improvement interventions. Factors relating to failure of uptake were identified, including radiocolloid particle size.

Conclusion: This closed loop audit significantly improved the success rate of sentinel lymph node success at our institution in line with current standards. The physical and pharmaceutical properties of radiocolloids impact on successful visualisation of SLN on lymphoscintography. Radiocolloid particle size is relevant for appropriate timing of lymphoscintigraphy following injection. These results have implications for a proposed national multi-centre audit of sentinel lymph node biopsy for melanoma in Ireland.

References:

1. Nonvisualized sentinel lymph nodes on lymphoscintigraphy in melanoma: predictive factors and surgical outcomes. Schuitevoerder, Grinlington, Stevens et al. Nuclear Medicine Communications: 2017; 38(5): 383-387
2. Sentinel node biopsy status is strongly predictive of survival in cutaneous melanoma: Extended follow-up of Oxford patients from 1998 to 2014. Thomson D, Rughani MG, Kuo R, Cassell OSC. Journal of Plastic, Reconstructive & Aesthetic Surgery 2017; 70:1397e1403
3. False Negative Sentinel Lymph Node Biopsies in Melanoma May Result From Deficiencies in Nuclear Medicine, Surgery, or Pathology. Kalim, Scolyer, Li et al. Ann Surg 2008;247: 1003–1010

Risk Factors for Postoperative Hematomas in the Patients Undergoing Head and Neck Cancer Reconstruction

Presenter: Kuan Ying Wang, MD , Plastic Surgery, Kaohsiung Veterans General Hospital, Kaohsiung, Taiwan
Co-Author: Wen-Chung Liu, MD, PhD , Plastic Surgery, Kaohsiung Veterans General Hospital, Kaohsiung/ National Yang-Ming University, Taipei, Taiwan, Kaohsiung, Taiwan

Background: Head and neck cancer reconstruction is complicated and requires a lot of time and effort for plastic surgeons to complete the surgery. Although this technique has improved over the past 20 years, free flap failures still occur. Postoperative hematoma is one of the most common complications and may compromise the perfusion of pedicles and perforators. In this study, we reviewed our patients to analyze the risk factors associated with postoperative hematomas.

Material and Methods: This study involved a retrospective chart review at a single institution from 2014 to 2016. We identified the patients undergoing free flap reconstructions for head and neck cancer. Patients with postoperative hematoma requiring surgical intervention were included in this study.

Result: We enlisted 289 patients undergoing head and neck reconstructions. Eighteen patients (6.2%) had postoperative hematomas of which twelve hematomas occurred within the first 3 days and nine in the first 24 hours after the reconstruction surgery. Comorbidities or postoperative blood pressures were not related to hematoma formation. There was a trend for blood pressure fluctuation to increase hematoma formation.

Conclusion: Our study revealed that blood pressure fluctuation tends to increase the risk for postoperative hematomas. We suggest that fluctuations in blood pressre should be controlled.

Transoral Robotic Surgery (TORS) for Head and Neck Squamous Cell Carcinoma: Healing by Secondary Intention, Local Flap or Free Flap?

Presenter: Rossella Sgarzani, PhD , Burn Unit, Maurizio Bufalini Hospital, Ausl Romagna, Cesena, Italy
Co-Authors: Filippo Montevecchi, MD , ENT Dpt, Morgagni Pierantoni Hospital, Ausl Romagna, Forl, Italy, Giuseppe Meccariello, MD , ENT Dpt, Morgagni Pierantoni Hospital, Ausl Romagna, Forl, Italy, Claudio Vicini, PhD , Ausl Romagna, Forl, Italy, Davide Melandri, MD , Burn Unit, Maurizio Bufalini Hospital, Ausl Romagna, Cesena, Italy

Head and neck squamous cell carcinoma (SCC) can be treated with similar oncologic outcomes either with primary chemoradiation therapy (CRT) or transoral robotic surgery (TORS) with or without adjuvant CRT(1). However, TORS offers several functional advantages. In locoregionally advanced patients TORS must be combined with flap reconstruction to restore function. From 2008 to December 2017, 514 TORS procedures were performed in our institution: 159 were tumor resections and 64 of them were SCC.

Aim of the study is to assess post-operative complications, pain and functional outcome at 6 months after TORS for head and neck SCC, in reconstructed and non-reconstructed patients.

We retrospectively evaluated sixty-four patients with SCC treated with TORS between January 2008 and December 2017. Site of the SCC, TNM staging, reconstructive method, time to wound healing, complications and 6 months functional outcomes have been evaluated.

The primary tumor was classified as cT1(22/64; 34.3%), cT2(25/64; 39%), cT3(8/64; 12.5%) and cTx(9/64; 14%). The primary tumor arose in the base of the tongue in 28 patients (43.7%), tonsils in 28 patients (43.7%), soft palate in 2 (3.1%), posterior pharyngeal wall in 3(4.6%) and supraglottis in 3 (4.6%). Fifty-four resections healed by secondary intention, 4 patients were reconstructed with a local flap (one facial artery myo-mucosal flap FAMM, one buccal aetery myo-mucosal flap, one temporalis myofascial flap TMF and one infrahyoid flap) and 6 underwent a reconstruction with a free antero lateral thigh flap ALT. Flap reconstruction was performed in selected patients with exposure of internal carotid artery, soft palate resection or oropharyngeal sphincter resection(2). Free flaps were carefully tailored according to Caliceti's “standard template"(3) method before their inset and robotic arms were used to inset the flap in 5 patients. No flap loss was encountered, whilst two flap dehiscence (1 FAMM and 1 ALT) that needed a surgical revision and a TMF partial necrosis were recorded. Eight patients had post-operative bleeding from primary tumor resection field, oral bleeding had a mean of 6.2 days in secondary healing wounds. Mean time to complete wound healing was 21.3 days in secondary healing wounds and 14.5 in flap reconstructed patients. At a 6 months follow up the patients recovered oral feeding and comprehensive locution, only one patient (pT3N2b of BOT invading tonsil and soft palate with ALT reconstruction) experienced a post-operative severe dysphagia and needed a permanent tracheostomy tube and percutaneous endoscopic gastrostomy PEG feeding.

Finally, in selected patients TORS improves the long term quality of life,compared to non surgical treatments with the same oncologic outcomes. Flap reconstruction allows

to extend the benefits of TORS to locally advanced cancer patients.

REFERENCES:

1.Ward MC, Koyfman SA. Transoral robotic surgery: The radiation oncologist's perspective. Oral Oncol 2016;60:96–102.
2. Hatten KM, Brody RM, Weinstein GS,et al. Defining the role of free flaps for transoral robotic surgery. Ann Plast Surg. 2018 Jan;80(1):45-49.
3. Caliceti U, Piccin O, Sgarzani R et al. Surgical strategies based on standard templates for microsurgical reconstruction of oral cavity and oropharynx soft tissue: a 20 years' experience. Microsurgery. 2013 Feb;33(2):90-104.

Immediate Single Stage Breast Reconstruction. A Single Centre Retrospective Analysis.

Presenter: Luca Maione, MD , 1Department of Medical Biotechnology and Translational Medicine BIOMETRA-Plastic Surgery Unit, Humanitas Research Hospital, Rozzano, Milano, Italy
Co-Authors: Valeriano Vinci, MD , Department of Medical Biotechnology and Translational Medicine BIOMETRA-Plastic Surgery Unit,, Humanitas Research Hospital, Rozzano, Milano, Italy, Andrea Vittorio Emanuele Lisa, MD , Department of Medical Biotechnology and Translational Medicine BIOMETRA-Plastic Surgery Unit,, Humanitas Research Hospital, Rozzano, Milano, Italy, Silvia Giannasi, MD , Department of Medical Biotechnology and Translational Medicine BIOMETRA-Plastic Surgery Unit,, Humanitas Research Hospital, Rozzano, Milano, Italy, Valeria Bandi, MD , Department of Medical Biotechnology and Translational Medicine BIOMETRA-Plastic Surgery Unit,, Humanitas Research Hospital, Rozzano, Milano, Italy, Alessandra Veronesi, MD , Department of Medical Biotechnology and Translational Medicine BIOMETRA-Plastic Surgery Unit,, Humanitas Research Hospital, Rozzano, Milano, Italy, Marco Klinger,
Prof , 1Department of Medical Biotechnology and Translational Medicine BIOMETRA, Humanitas Research Hospital, Rozzano, Italy

Background: The increasing number of skin and nipple sparing mastectomies made DTI breast reconstruction an excellent alternative to traditional two-stage surgery. The advantage of this technique is the possibility to obtain, at the time of mastectomy, a definitive result which eliminates the need for expansion with a low complication rate. The benefit for a vulnerable patient undergoing mastectomy for breast cancer treatment or prophylaxis is both practical and psychological: the result is an increased quality of life that is the final purpose of every breast reconstruction approach. The aim of this study is to analyse critically our experience, comparing our results with similar studies in literature, looking for an unceasing improvement.

Methods: The retrospective review includes all patients undergoing immediate implant reconstruction. Patients' charts were reviewed for patient and surgical aspects, and the occurrence of any complication.

Results: Between April 2013 and December 2017, DTI reconstruction was performed in 216 sequential patients on a total of 251 breasts, *at Humanitas Research Hospital*. The number increased from 22 in 2013 to 62 in 2017. The average age and BMI were 46,95 years and 21,09 kg/ m^2. The average implant size was 245,11 cc, and 5,53% of reconstruction used ADM. Total complications included seroma (8,76%), hematomas (1,38%), skin necrosis (11,52%), infections (5,53) and capsular contracture III-IV (7,37%). Implant removal occurred in 3,68%. BMI emerged as a protective factor (p 0,02) for overall complication, whereas the BMI average value was very low. Infection rate increased with age (p 0,04).

Conclusion: The study confirms the safety of the DTI reconstruction and the low complication rate that relies strictly on appropriate patient selection and intraoperative valuation of skin envelope in the postmastectomy setting.