



ASRM Scientific Paper Presentations: Breast I

January 17, 2016 – 1:00 PM to 2:30 PM

1:00 PM - 1:05 PM

An Innovative Risk-Reducing Approach to Post-Mastectomy Radiation Delivery Following Autologous Breast Reconstruction

University of California, San Francisco, San Francisco, CA, USA

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Introduction:

There is no consensus among radiation oncologists regarding delivery of post-mastectomy radiation therapy (PMRT) after immediate autologous breast reconstruction, and plastic surgeons rarely participate in this decision-making process. However, radiation-induced changes markedly influence flap outcomes and affect the flap permanently. We present an innovative approach for PMRT delivery, through the use of custom bolus. This technique provides individualized, targeted PMRT to the reconstructed breast to minimize flap-related complications.

Methods:

All patients who underwent mastectomy with immediate autologous reconstruction between 2005 and 2014 at our institution were identified. Radiation was delivered to the reconstructed autologous breast in 29 patients. Post-irradiation complications and reconstruction outcomes were compared for patients treated with custom bolus, standard PMRT, and historical controls.

Results:

Over the past 10 years, 157 patients (226 breasts) underwent immediate autologous tissue breast reconstruction following mastectomy. Of the 29 patients who received PMRT, 10 were treated with custom bolus. The custom bolus uses perforated Aquaplast and a nearly tissue-equivalent wax to form a cast which conforms to the irregular contours of the chest wall, allowing for easy application through the duration of treatment. Pre-irradiation computed tomography was used to optimize dose distribution, evaluate the internal mammary vessels, and target the deeper tissues adjacent to the chest wall (minimizing dose inhomogeneity to the skin). Custom bolus resulted in fewer radiation-induced skin changes and less skin tethering/fibrosis than standard bolus (0% vs

10% and 20% vs 35%, respectively), and less volume loss and contour deformities compared with historical controls (10% vs 22.8% and 10% vs 30.7%, respectively).

Conclusion:

The use of custom bolus tailors radiation delivery to the internal mammary vessels, anastomoses, and skin; uniformly doses the surgical incision; and provides the necessary radiation dose to prevent recurrence, thus not compromising oncologic safety. It is easily fabricated, cost-effective and placement is straightforward and reproducible. Because radiation has negative effects on autologous breast reconstruction and often results in vascular intimal fibrosis and fat necrosis, plastic surgeons should participate in radiation planning. Our custom bolus PMRT technique reduces the incidence of these radiation effects.

1:05 PM - 1:10 PM

Immediate Implant Exchange During Acute Infection in the Setting of Breast Reconstruction

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Introduction: Acute prosthesis infection in the setting of breast reconstruction is traditionally managed with explantation, surgical washout, and delayed reconstruction. However this results in a loss of the soft tissue envelope requiring re-expansion and placing significant psychological and physical burden on patients. In this study, we describe our experience managing breast implant infections with operative washout and immediate implant exchange in breast reconstruction patients.

Methods: An Institutional Review Board-approved retrospective chart review was performed at the University of Michigan on all breast reconstruction patients who underwent surgical management for an infected breast implant by the senior surgeons (DLB and JHK) from January 1, 2010 to April 15, 2015. Patients were included in the study if they were diagnosed with acute infection of the reconstructed breast and taken to the operating room for washout and immediate exchange of either the tissue expander or permanent implant vs explantation. Patient charts were reviewed for demographic information, implant type, whether the implant was immediately replaced at the time of washout, final reconstruction status, and time from washout to final reconstruction (days). Use of intravenous antibiotics, length of admission, additional interventions and culture data were also collected.

Results: A total of 31 breast reconstruction patients with expander / permanent implant infections requiring operative intervention were identified during the study period. In each of these documented infections, the patient underwent removal of the implant. Immediate implant exchange was completed in 15 patients and explantation was completed in 16 patients. Intraoperative cultures were positive in 33% of immediate implant exchange patients vs 69% of explantation patients ($p=0.01$). Patients with immediate implant exchange were recommended to continue postoperative IV antibiotics in 66% of cases vs 19% of cases for explanation ($p=0.02$). At the time of this study 80% of patients undergoing immediate implant exchange had completed reconstruction vs 56% of patients treated with explantation. No

patients required subsequent explantation after immediate implant exchange for refractory infection. Time to final reconstruction was 206 days in immediate implant exchange vs 569 days in explantation (p=0.005).

Conclusions: Here we describe our experience with immediate prosthesis exchange in breast reconstruction patients with infection. Our findings suggest this technique is safe in appropriately selected patients. Furthermore, patients treated with immediate implant exchange have a reduced time to achieve final reconstruction.

1:10 PM - 1:15 PM

Processes of care in breast reconstruction and the long-term impact of a comprehensive breast center

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Background: Increased emphasis has been placed on process outcomes for breast cancer care, including by the U.S. Department of Health and Human Services and World Health Organization. While most other breast cancer-related specialties have defined measures for processes of care and set benchmarks, limited data exists on these measures for breast reconstruction. These processes are likely to be impacted by the increased centralization of breast cancer care into comprehensive breast centers (CBC). Our study objectives were to define measures for processes of care in breast reconstruction, and to determine the long-term impact of a CBC on these measures.

Methods: A 5-year review was performed of patients who underwent mastectomy with or without reconstruction for a newly diagnosed breast cancer between 2010-2014, which spans from 1 year before to 4 years after introduction of our CBC. Access to breast reconstruction was evaluated by examining internal referral rates and immediate reconstruction rates. Quality of breast reconstruction services was assessed by evaluating the timeliness of new patient evaluations, and of coordination of combined ablative and reconstructive surgery.

Results: A total of 4,179 patients were reviewed. The internal referral rate for immediate reconstruction increased from 40.0 to 70.8 percent (p<0.001), and the immediate breast reconstruction rate increased from 36.7 to 65.0 percent (p<0.001), both of which plateaued in the fourth study year. The interval between surgical oncology and plastic surgery consultation decreased (9.2 to 2.5 days, p<0.001), and stabilized in the second study year. The interval between plastic surgery consultation and surgery decreased throughout the course of the entire study (37.6 to 20.8 days, p<0.001), resulting in continued improvements in the interval between surgical oncology consultation and surgery throughout the entire study period (46.8 to 23.3 days, p<0.001). This resulted in a surgery wait time comparable to the target set by the American Society of Clinical Oncology for patients not undergoing reconstruction (≤ 21 days between a decision for surgery and the actual surgery date).

Conclusion: In breast reconstruction, a CBC results in improvements in process outcomes, some of which are realized in the short-term and others in the long-term. The timeliness of treatment of

breast cancer patients who undergo immediate postmastectomy reconstruction can be similar to targets set for patients who undergo mastectomy alone.

1:15 PM - 1:18 PM

Discussion

1:18 PM - 1:23 PM

The “Dual-Plane” DIEP Free Flap: Defining the Effect of Perfusion Enhancement on Clinical Outcomes

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Introduction: With improved perforator flap dissection techniques, DIEP free flaps are routinely elevated on a single dominant perforator from the deep epigastric vascular system. While this provides form-preserving abdominal donor sites, the single perforator may not always perfuse an entire flap adequately, particularly supra-scarpal tissue in the flap periphery. We routinely perform “dual-plane” single perforator DIEP flaps, by rerouting the superficial (SIEA/V) system directly into the superior continuation of the deep (DIEA/P) vascular system pedicle, thus allowing both systems to contribute equally, and enhance flap perfusion significantly (Figure 1). Both systems thus perfuse from a single internal mammary vessel anastomosis on the chest.

Methods: A prospectively-collected database of patients undergoing microvascular abdominally-based free flap breast reconstruction was reviewed for patients who underwent “dual-plane” DIEP flaps. These were matched to a similar cohort of patients undergoing traditional DIEP free flaps over the same time period. Flap-specific morbidity outcomes were assessed, including wound healing complications, fat necrosis rates, and performance in the setting of radiation.

Results: During the two-year study period, there were 23 “dual-plane” microvascular DIEP free flaps performed (15 patients), compared to 35 (23 patients) single-perforator “traditional” DIEP free flaps. Rates of chest delayed healing were similar between the 2 cohorts (2.9% vs. 4.3%, $p = 0.28$). Rates of clinically palpable fat necrosis requiring excision were significantly higher in the traditional flaps compared to the dual-plane flaps (14.3% vs. 0%, $p = 0.03$). Rates of clinically palpable fat necrosis following radiation were significantly higher in the “traditional” flaps (40% vs. 4.3%, $p = 0.02$).

Conclusions: The “dual-plane” DIEP free flap for breast reconstruction is one we routinely perform, as it allows for full preservation of functional abdominal musculature, and offers enhanced flap perfusion by incorporating both the deep and superficial (dominant) vascular systems. This enhanced multi-plane flap perfusion results in lower fat necrosis rates, particularly in the setting of post-reconstruction radiation. This protective effect in the setting of radiation has led us to routinely perform this anatomic variation of the DIEP free flap, particularly when radiation is anticipated.

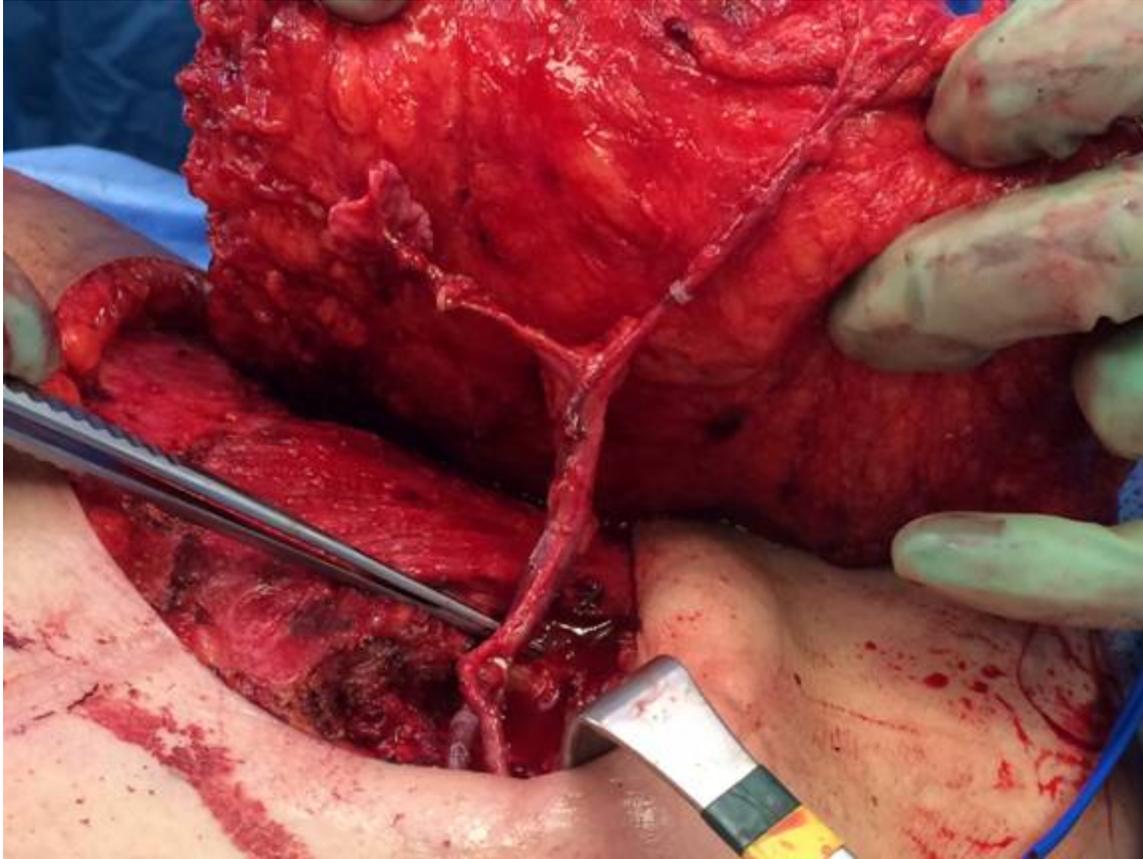


Figure 1. Example of rerouting the superficial (SIEA/V) system directly into the superior continuation of the deep (DIEA/P) vascular system pedicle.

1:23 PM - 1:28 PM

100 consecutive Profunda Artery Perforator flaps in breast reconstruction – our early experience

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Introduction:Free and local flaps based on the profunda artery perforators were first used for reconstruction of pressure sores, burn contractures and extremity wounds. Recently a revised profunda artery perforator (PAP) flap was introduced for breast reconstruction. But despite increasing reports of the use of the PAP flap, it remains a rarely used option. We present our early experience with the first 100 PAP flaps used for breast reconstruction at our institution.

Methods:We conducted a retrospective review of all patients of the senior authors who underwent breast reconstruction with PAP flaps prior to July 2015. Patient demographics, perioperative data, and postoperative complications were recorded and analyzed.

Results:101 consecutive PAP flaps were used to reconstruct 98 breasts. In 24 breasts, a PAP flap was used in conjunction with another flap—with a DIEP flap (20), SGAP flap (1), or as stacked

PAP flaps (3). Mean flap size was 390g (range 235 – 695g) and mean patient BMI was 24.5 (range 18.2 – 34.6). Total flap failure rate was 2.0%. There was one case of clinically apparent fat necrosis. There were no other major flap complications. Donor site complications included cellulitis (2 thighs, 2.0%), and minor wound dehiscence (6 thighs, 5.9%). All donor site complications healed satisfactorily by secondary intention without any additional procedures.

Conclusion: The PAP flap is a safe and reliable option for breast reconstruction. Flap size is adequate for breast reconstruction in appropriately selected patients. Furthermore, it can be combined with other flaps when additional volume or skin requirements are present. Flap and donor site complications are comparable to other free tissue breast reconstruction options.

1:28 PM - 1:33 PM

Lateral thigh perforator (LTP) flap for autologous breast reconstruction

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Text:

Introduction

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

Material and methods

thirty four consecutive LTP flaps were performed for breast reconstruction in 25 patients. 13 LTP were immediate reconstruction en 21 delayed reconstructions. Patients demographics, flaps characteristics, operative technique and time, length of hospital stay and outcomes were registered.

Results

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

Conclusion

The LTP flap is the second choice after the DIEP flap in our institution for autologous breast reconstruction: it can be dissected in supine position simultaneously with the mastectomy en/or dissection of the mammary vessels, it has a long pedicle with a good caliber, the scar at the donor site can be often hidden under the underwear even improving sometimes the shape of the patients.

1:33 PM - 1:36 PM

Discussion

1:36 PM - 1:41 PM

Morbidity Associated with Autologous Breast Reconstruction Before and After Exposure to Radiotherapy: Retrospective Single-Center Study

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Introduction: The indications for postoperative radiotherapy following mastectomy are expanding. However, the full impact of radiotherapy on breast reconstructions is not yet completely understood. The current literature on this subject is controversial. The purpose of this study was to evaluate the long-term effects of radiation therapy on breast reconstruction.

Methods: All patients who underwent autologous breast reconstruction at the University Hospitals Leuven between August 1997 and October 2013 (n=1553) were evaluated retrospectively. 20 patients with immediate reconstruction (IR) and post mastectomy radiation therapy (PMRT) were matched with 40 patients with PMRT and delayed reconstruction (DR), according to age and BMI. Early and late complications were compared between both groups after a follow-up of a minimum of 3 years. Also, the need for corrective procedures on the reconstructed and contralateral breast was evaluated. Data were collected using patients' medical records.

Results: The rate of fat necrosis and contracture was significantly higher in the group with IR and PMRT than in the group with the DR. In 12 out of 20 patients (60%) in the IR group, contracture and fibrosis occurred in the reconstructed breast, which is significantly higher than the 2.5% fibrosis rate in the delayed group. The same amount of patients (60%) developed fat necrosis in the IR group, as opposed to the 12.5% fat necrosis rate in the DR group. There were two revisions in the delayed group, both due to venous occlusion. Both revisions were successful and no flap failure was seen in either group. The rate of early complications did not differ significantly between the two groups. Regarding the corrective procedures to the reconstructed breast or symmetrizing operations in the contralateral breast, there were no significant differences between both groups.

Conclusion: Because of the potential adverse effects of radiation therapy on breast reconstruction we recommend to delay reconstruction in patients who require PMRT where possible. The inability to predict which patients will have a poor outcome and the chance of delay of adjuvant therapy reinforce our belief that reconstruction should be postponed unless there is an explicit patient demand.

1:41 PM - 1:46 PM

Postoperative Quality of Life And Anxiety Level Following Unilateral Versus Bilateral Breast Reconstruction in Patients with Unilateral Breast Cancer

Memorial Sloan Kettering Cancer Institute, New York, NY, USA

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BACKGROUND: The choice to undergo contralateral prophylactic mastectomy (CPM), in the absence of increased risk for contralateral breast cancer, involves a number of tradeoffs to be

considered by the patient. On one hand is the possibility of greater morbidity following bilateral mastectomy with reconstruction, but on the other is the potential benefit of improved symmetry for prosthetic reconstructions as well as anxiety reduction following CPM. The aim of this study is to measure patient reported outcomes (PRO) including anxiety, in patients undergoing unilateral or bilateral breast reconstruction for unilateral breast cancer. The first hypothesis is that bilateral implant reconstructions result in greater satisfaction relative to similar unilateral reconstructions. The second hypothesis is that patients choosing CPM have greater anxiety. **METHODS:** Women undergoing mastectomy and breast reconstruction for unilateral breast cancer, were recruited as part of the Mastectomy Reconstruction Outcomes Consortium Study. Demographic and clinical data were collected prospectively at 10 major medical centers in the North America. Preoperative and one year PROs were measured by the BREAST-Q, PROMIS 29 Anxiety Section, and Generalized Anxiety Disorder. Mean PRO scores at baseline and 1-year were compared between bilateral and unilateral reconstructions. Multivariable regression models were run with the predictor of interest being laterality, controlling for baseline PRO score, clinical, and reconstructive variables. **RESULTS:** Data were available for 1144 women who underwent unilateral (45.5%) or bilateral (54.5%) mastectomy with reconstruction for unilateral cancer. Baseline Breast-Q scores for patients undergoing unilateral or bilateral mastectomy with reconstruction were similar. However, baseline anxiety was greater in women who chose bilateral compared to unilateral implant reconstructions (p

1:46 PM - 1:51 PM

The donor site morbidity associated with DCIA perforator flaps: a functional and aesthetic perspective

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Purpose: The anterior abdominal wall is the donor site of choice in autologous tissue breast reconstruction. When the anterior abdominal wall is not sufficient or has previously been harvested, secondary options are chosen. Secondary donor sites frequently result in suboptimal donor defects. The lateral abdominal wall (flanks) can often provide adequate tissue. We previously presented the DCIA perforator flap technique and with this study report on the functional and aesthetic outcomes of the donor site.

Methods: This study is a retrospective series of 20 DCIA perforator flaps performed in 12 patients by a single surgeon. All flap and donor site complications were recorded. Patients completed validated questionnaires assessing post-operative pain, functioning and satisfaction with their donor sites. Clinical exams were performed to document donor site symmetry, complications and reconstructive quality.

Results: Mean age of patients was 51.9 years with an average BMI of 22.9 kg/m². Of the 20 flaps, 14 were in combination with DIEP or SIEA flaps to increase the volume available for reconstruction. 6 of 20 flaps were used due to the unavailability of anterior abdominal tissue (previous TRAM, DIEP or SIEA reconstructions or a prior abdominoplasty). 1 week and 3 month postoperative pain scores were 2.62 +/- 1.141 and 1.33 +/- 1.94 respectively (scale of 0-10). Anterior abdominal pulling and tightness was reported to a greater degree than lateral abdominal pulling and tightness in all patients, despite clinically tighter closure of the flanks.

Pain did not significantly interfere with social, work or home responsibilities. There were no cases of flank asymmetry or lateral abdominal wall hernias. One patient had a mild flank bulge. Of the 20 donor sites, 4 had minor wound breakdown treated with dressing changes. There were 2 patients who had significant enough wound breakdown to require re-closure. All patients were able to accomplish their ADL's with minimal to no difficulty and were able to return to work. Almost all patients were satisfied with the appearance and symmetry of their donor site and overall abdominal contour.

Conclusions: The DCIA perforator flap can transfer flank tissue by itself or in combination with the DIEP or SIEA flap efficiently, with limited complications and morbidity of the donor site and high aesthetic and functional satisfaction. Our study delineated two good indications for use of the DCIA perforator flap: (1) thin women - either alone or in combination with anterior abdominal tissue; (2) women with unavailable anterior abdominal wall tissue.

1:51 PM - 1:54 PM

Discussion

1:54 PM - 1:59 PM

Quantification of Breast Sensibility following Postmastectomy Reconstruction: A Comparison of Prosthetic and Autologous Techniques

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Background: Breast reconstruction following mastectomy has been shown to have a positive effect on the psychological and emotional well being of women with breast cancer. To date, the focus of post mastectomy reconstruction has been on the restoration of breast form. Little attention has been given to the recovery of important sensory components in the reconstructed breast. The aims of this study were i) to compare the recovered sensibilities (touch, pressure, vibration, temperature and pain) between patients who had either mastectomy alone, tissue expander/implant based reconstruction or autologous reconstruction ii) to identify factors that may negatively impact reinnervation following breast reconstruction.

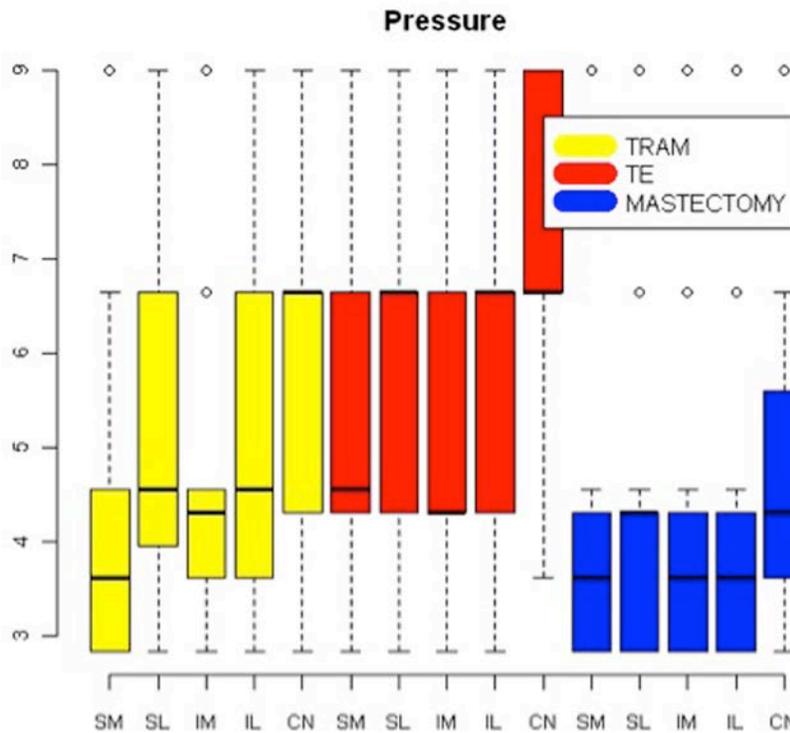
Methods: Consecutive patients who had either mastectomy alone, mastectomy with TE/implant based reconstruction, or mastectomy and autologous reconstruction at a tertiary cancer center were prospectively enrolled in the study. Sensory examination was performed at least 1 year post completion of surgery. Each reconstructed breast was divided into four quadrants [superomedial (SM), superolateral (SL), inferomedial (IM), inferolateral (IL)] and one central (CN) area (diameter 4 cm). Sensations were noted for each quadrant. Role of confounding variables e.g. sentinel lymph node biopsy, axillary lymph node dissection and adjuvant therapies, was evaluated using regression analysis.

Results: Total sample size was 150 patients (Autologous = 51, TE/Implant = 50, Mastectomy alone = 49). Mean duration from initial surgery to sensory exam was 3.8 years. Type of surgery was a significant predictor for return of all sensory functions ($p < 0.05$). Patients who underwent

mastectomy alone were the least likely to have return of objective sensation ($p < 0.05$). BMI and history of radiotherapy were significant negative predictors for return of pressure and vibration sensations ($p < 0.05$). History of ALND and receipt of chemotherapy played no significant role in return of sensations. The highest proportion of patients felt all types of sensations in the superomedial quadrant.

Conclusion: Return of breast sensations following breast reconstruction is different depending on type of breast surgery performed. The superomedial quadrant is the most common location for return of sensations following breast reconstruction. This objective data will aid plastic surgeons in providing accurate information to patients contemplating on type of breast surgery to choose. Reliable information about postoperative return of sensation will also help in managing patients' preoperative expectations and in turn improving their postoperative satisfaction.

Figure 1: Box plot of lightest probe that evokes the perception of pressure by surgery type and breast quadrant. Lower values represent better return of function.



1:59 PM - 2:04 PM

Laparoscopic DIEP Flap Pedicle Harvest Minimizes Fascial Incisions

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Background: The DIEP flap has proven to offer an improved donor site over the free TRAM and MS-free TRAM. However, there remains room for improvement. Reductions in pain with

improved postoperative mobility and decreased risk of the rare bulge/hernia are possible. Many of the achievable gains can be produced with a reduction in the extent of fascial and muscular incisions. Research in similar procedures has shown improvements with application of laparoscopic techniques. With the addition of laparoscopic dissection to DIEP harvest it is possible to reduce the length of fascial incisions while extending pedicle length and improving donor site morbidity.

Methods: The authors performed a retrospective analysis of all laparoscopic DIEP cases over the past year. Cases were completed with a laparoscopic assisted approach to DIEP flap harvest. After perforator exposure, flaps were raised with a balloon dissected laparoscopic preperitoneal harvest of the DIEP flap pedicle. The pedicles were then delivered through limited fascial incisions. Number and location of perforators were recorded. Pedicle and fascial incision lengths were measured.

Results: We attempted to harvest 42 flaps in 23 patients. 34/42 (81%) flaps in 20 patients were harvested successfully with the laparoscopic approach. 8/42 (19%) flaps in 5 patients had to be harvested by traditional methods after failure of laparoscopic techniques (2 patients had one flap raised laparoscopic and the other traditionally.) The most common reason for inability to complete laparoscopic harvest (6/8) was inadvertent intraperitoneal dissection and loss of preperitoneal space. Difficulty in flap harvest correlated closely with previous intraabdominal surgery performed through a Pfannenstiel or lower midline incision. Operative time averaged 453 minutes, pedicle length averaged 11.0cm and fascial incision length averaged 2.8cm. Hospital stay averaged 3.2 nights and patients were noted subjectively to have less pain and a quicker recovery.

Discussion: The DIEP flap offers distinct donor site advantages over other abdominal based flaps that include variable amounts of muscle. By minimizing fascial incisional length and muscular division it is possible to further reduce any residual morbidity and improve patient recovery. Preperitoneal laparoscopic dissection of the DIEP pedicle is demonstrated to be technically feasible with minimal morbidity. Additional experience will delineate optimal port placement and dissection techniques and further define specific reductions in morbidity compared with traditional harvest.

2:04 PM - 2:09 PM

Reducing Postoperative Donor Site Morbidity following DIEP Flap Breast Reconstruction with Monofilament Poly-4-Hydroxybutyrate Bioabsorbable Onlay Mesh

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Purpose: Deep inferior epigastric perforator (DIEP) flap breast reconstruction offers reduced donor site morbidity when compared to non-muscle sparing techniques. However, abdominal bulges still occur postoperatively. Bioabsorbable meshes can reinforce the abdominal wall while reducing risk of mesh infection as found with permanent synthetic mesh. The purpose of this

study was to evaluate the use of a bioabsorbable onlay mesh on reducing postoperative abdominal bulge following DIEP reconstruction.

Methods: All patients undergoing DIEP flap breast reconstructions from January 2010 to January 2014 at a single tertiary medical center were reviewed. Patients were divided into two groups for comparison based on whether a bioabsorbable onlay mesh (Phasix™ [Monofilament Poly-4-Hydroxybutyrate], Bard Inc., Warwick, RI) was utilized for reinforcement of the anterior rectus fascia. Rates of postoperative abdominal bulge were compared between the groups utilizing standard statistical methods.

Results: In the study period, 319 patients underwent 513 DIEP reconstructions, 160 (50.2%) utilized bioabsorbable onlay mesh and 159 (49.8%) did not (no-mesh). The average follow-up was 13.7±10.3 months. There was no difference in age (49±9.3yrs), current tobacco use, diabetes, or mean BMI (29.4±4.4) between the mesh and no-mesh groups ($p>0.05$); however, there was a higher proportion of obese patients (BMI>30) in the mesh group (45.0% vs. 33.3%; $p<0.05$). Abdominal bulge rate following DIEP with mesh was lower than the non-mesh group (0 vs. 5.0%; $p<0.01$). In the entire sample, 194 (60.8%) underwent bilateral DIEP and 125 (39.2%) underwent unilateral. In unilateral DIEP patients, the bulge rate was similar between mesh and non-mesh groups (0 vs. 3.5%; $p>0.05$); however in bilateral DIEP patients, the bulge rate was lower in the mesh compared to non-mesh group (0 vs. 6.8%; $p<0.01$).

Conclusion: Although DIEP flap breast reconstruction can reduce rates of postoperative abdominal donor site morbidity by preserving anterior rectus muscle and fascia, it is still subject to abdominal bulge. This study demonstrates that reinforcement of the anterior rectus with a bioabsorbable onlay mesh may reduce the risk of postoperative bulge rate in patients undergoing DIEP reconstruction. Furthermore, those undergoing bilateral DIEP reconstruction are at higher risk of abdominal wall bulge and gain additional benefit from onlay mesh reinforcement.

2:09 PM - 2:12 PM

Discussion

2:12 PM - 2:17 PM

Late Sensory Morbidity in Tissue Expander/Implant Reconstruction With and Without the Use of Acellular Dermal Matrices: A Multicenter, Blinded, Randomized Controlled Trial

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Background: The incidence of chronic post-mastectomy pain syndrome has been reported as high as 50%. It remains unclear how immediate post-mastectomy reconstruction with a tissue expander impacts on the development of this neuropathic pain, yet some have hypothesized that the elevation of serratus anterior fascia and subsequent disruption of lateral intercostal nerves may further exacerbate this syndrome. Use of an acellular dermal matrix (ADM) to create the

inferolateral expander pocket obviates the need for elevation of fascia and may minimize disruption of these nerves. The aim of this study was to evaluate the long-term effect of ADM on patient reported pain and sensory morbidity.

Methods: A multicenter, blinded, randomized controlled trial was conducted at two tertiary care centers in the US. Eligible patients were randomized to one of the two treatment arms: i) ADM-assisted, tissue expander (TE)/implant reconstruction; or ii) submuscular TE/implant placement. Patient reported pain was assessed using the Visual Analogue Scale (VAS) and the BREAST-Q Physical Well-being: Chest and Upper Body Scale. Sensory morbidity was assessed using the Breast Sensation Assessment Scale. Overall patient satisfaction was evaluated using the BREAST-Q: Reconstruction Module. All evaluations were performed at 6 and 12 months following completion of breast reconstruction.

Results: Seventy patients were randomized into the AlloDerm group (n=36) or standard group (n=34). There was no difference in patient age, breast cancer stage, mean mastectomy weight, or the proportion of patients receiving chemotherapy between the two groups. There was also no difference in baseline preoperative visual analog scale scores (p=0.33) and BREAST-Q Physical Well-being scores (p=0.88) between groups. There was no significant difference in patient reported pain on the VAS at 6 and 12 months (p=0.20 and 0.84 respectively). Mean BREAST-Q Physical Well-being scores were similar between the two groups at 6 and 12 months (p=0.48 and 0.42 respectively). There was no difference in sensory morbidity between the two groups. Patient reported, satisfaction with breasts, outcome, psychosocial and sexual well-being scores on the BREAST-Q were similar between the two groups at 6 and 12 months.

Conclusion: The results of this study suggest that the use of ADM in immediate, TE/implant reconstruction does not affect long-term, patient-reported pain as compared to the TE/implant reconstruction using a traditional, sub-muscular technique. This high level evidence provides useful information for reconstructive surgeons as well as patients to consider while discussing ADM-assisted breast reconstruction.

2:17 PM - 2:22 PM

Influence of race, insurance status, and geographic access to plastic surgeons on immediate breast reconstruction rates

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Background: Recent evidence suggests that as the number of plastic surgeons in a health service area increases, women with breast cancer treated in those areas are more likely to have breast reconstruction. However, the relationship between more plastic surgeons and higher breast reconstruction rates does not appear to benefit all women equally. We conducted this study to evaluate the relationship between rates of immediate breast reconstruction among racial and payer subgroups in the setting of a changing plastic surgeon workforce.

Methods: Using state level inpatient and ambulatory surgery data from California, Florida, and New York, we identified discharges for women ≥ 18 years of age that underwent mastectomy for breast cancer. This data was aggregated to the health service area-level and supplemented with plastic surgeon workforce data (plastic surgeons per 100,000 population) available via the Area Health Resource File. Hierarchical generalized linear models were then used to risk standardized breast reconstruction rates for 8 race-payer subgroups across health service areas: White, Black, Hispanic, or Asian, Pacific Islander, or Native American (APINA) and payer (private or public). Volume weighted correlation coefficients were calculated to quantify the relationship between health service area plastic surgeon workforce and breast reconstruction rates.

Results: The final cohort included 65,246 women who underwent mastectomy for cancer across 67 health service areas in 3 states. The plastic surgeon density per 100,000 population was directly related to the risk standardized breast reconstruction rate (correlation coefficient=0.69, p value <0.001). For example, in areas with <1.0 plastic surgeons/100,000, the breast reconstruction rate was only 23% vs. 60% in areas with >3.0 plastic surgeons/100,000. While all subgroups saw at least a modest increase in breast reconstruction rates, White women with private insurance realized the largest absolute increase (46%), while Black and APINA women with public insurance saw the smallest increase (6%). Despite higher plastic surgeon density and private insurance, racial disparities persisted.

Conclusion: Although rates of IBR are steadily increasing nationally, the likelihood of women undergoing IBR is significantly impacted by the propensity of plastic surgeons in the area that they undergo mastectomy and further impacted according to the form of insurance they possess. Of heightened concern is that even within privately insured patients, Black, Hispanic, and APINA patients have significantly lower rates of breast reconstruction compared to Whites. Identifying these inequalities suggest the need for heightened dedication to local, regional and national initiatives to help mitigate these glaring health care disparities.

FIGURE 1. BREAST RECONSTRUCTION RATES FOR WOMEN WITH PUBLIC INSURANCE AS PLASTIC SURGEON DENSITY INCREASES, STRATIFIED BY RACE

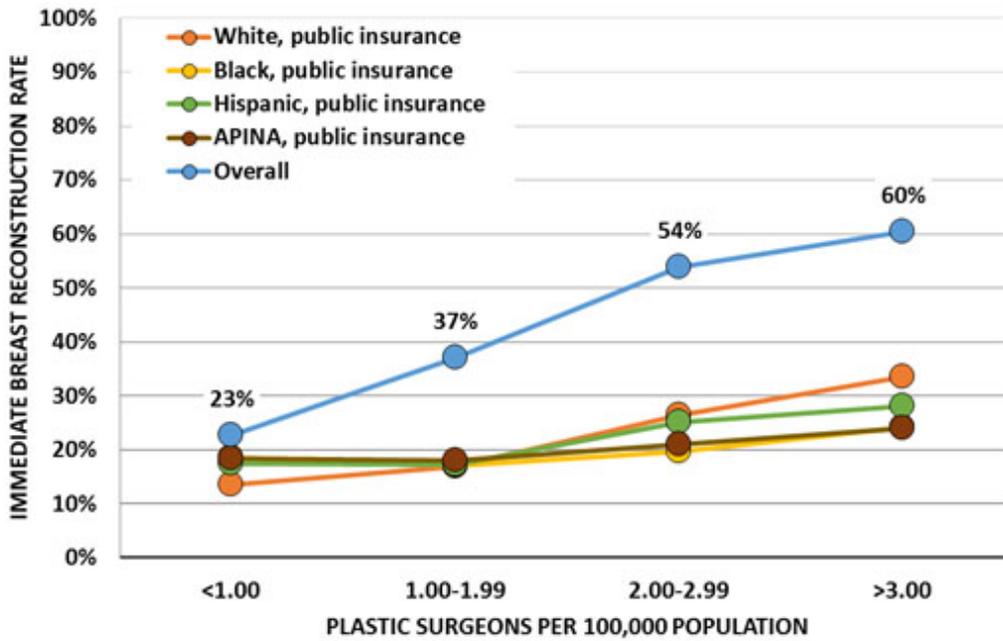
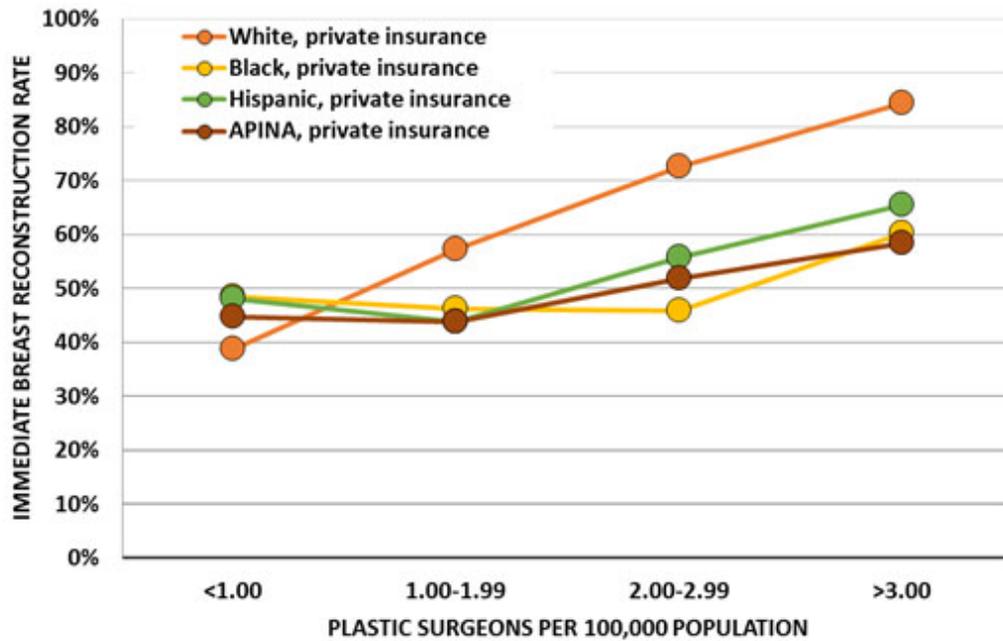


FIGURE 2. BREAST RECONSTRUCTION RATES FOR WOMEN WITH PRIVATE INSURANCE AS PLASTIC SURGEON DENSITY INCREASES, STRATIFIED BY RACE



2:22 PM - 2:27 PM

Composite Bi-pedicled Abdominal Free Flaps in Unilateral Autologous Breast

Reconstruction: Who Are the Ideal Patients?

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Background: Using a hemi-abdominal flap for unilateral breast reconstruction in some patients may not be ideal. In these patients, we studied the necessity and indications of using the entire lower abdomen (both hemi-abdominal flaps) in a bi-pedicled non-split composite fashion.

Methods: Forty consecutive bi-pedicled abdominal composite free flaps for unilateral breast reconstruction were performed. Patient demographics, type and weights of flaps, number of anastomoses, length and type of pedicles, and flap related complications were recorded. Using a simplified unique algorithm that we developed, the bi-pedicled flaps were anastomosed to split IMA/V or an intraflap anastomosis was performed and anastomosed to the IMA/V.

Results: Forty patients underwent composite DIEP and/or SIEA flaps (80 total flaps). Average flap weight was 1,095 +/- 488 grams (average age 59 yrs and average BMI 26.7 +/- 3.9). Twenty patients (50%) had flaps > 1,000 grams (average 1,461 grams, range 1052-2400 grams), and 30 (75%) patients had flaps > 750 grams. Thirty one patients had delayed reconstruction and 9 were immediate. Nineteen patients had intra-flap anastomosis over the abdomen and carried as single large composite flap to cranial IMA/V; 21 patients had independent bi-pedicle flaps anastomosed to cranial and caudal split IMA/V. There were 29 DIEP-DIEP flaps, 9 DIEP-SIEA flaps, and 2 SIEA-SIEA flaps. Flaps were not split in midline, but carried as a composite hemi-abdominal flap with anastomosis to the IMA/V. There were no flap losses.

Conclusion: Composite bi-pedicle hemi-abdominal flaps for unilateral breast reconstruction are feasible with low complication rates but are technically challenging, especially in flaps >1,000 grams. To maximize aesthetic outcomes, use of these highly complex double pedicle abdominal flaps can achieve ideal results in 3 categories of patients who lack enough hemi-abdomen volume: 1). Large contralateral breast, 2). Radiation deficits, 3). Extensive post-mastectomy defects. The radiated patient is particularly suited for such flaps due to 3 aspects required to achieve an excellent outcome: Ptosis, volume, and need for additional healthy skin. Unique technical considerations such as composite flap inset and handling, use of a simplified algorithm, and selection of anastomosis and pedicles will be presented to make these flaps consistently successful.

2:27 PM - 2:30 PM

Discussion