January 21-27, 2015
ATLANTIS
PARADISE ISLAND, BAHAMAS

2015 ANNUAL MEETINGS
AAHS ASPN ASRM

January 21-24, 2015
American Association for Hand Surgery

January 23-25, 2015
American Society for Peripheral Nerve

January 24-27, 2015
American Society for Reconstructive Microsurgery

Scientific Paper Session: Breast
Tuesday January 27, 2015
7:00am-8:45am

7:00 AM - 7:04 AM
Does Body Mass Index Boost Operative Time in Breast Reconstruction?
Stanford University, Stanford, CA, USA
Joel Bronstein, BSE; Bassam Kadry, MD; Gordon Lee, MD; Stanford University
Purpose:

Obesity is a growing epidemic, which is known to adversely affect surgical outcomes. In addition to increasing complication rates, plastic surgeons anecdotally complain that operative times are longer. The purpose of this study is to determine the correlation of body mass index (BMI), operative times, and surgical complications in patients undergoing microvascular breast reconstructive surgery using abdominal tissue flaps.

Methods:

A retrospective cohort study was conducted to analyze the effect of obesity/BMI on operative times and complication rates after free abdominal flap based breast reconstruction. Patients undergoing bilateral breast reconstruction between January 2008, and April 2014, at a single academic institution were included. Complications were classified as medical (myocardial infarction, deep vein thrombosis, pulmonary embolus, acute kidney injury, respiratory failure, sepsis), donor-site (delayed wound healing, infection, seroma, hernia, abdominal bulging) and recipient-site (partial/total flap loss, fat necrosis, delayed wound healing, infection, mastectomy skin flap necrosis, areolar necrosis). Patients were categorized by BMI into four groups: Group 1 (<30 kg/m^2), Group 2 (30-34 kg/m^2), Group 3 (35-40 kg/m^2), and Group 4 (>40 kg/m^2). Statistical analyses were performed using a one-way ANOVA. Reconstruction timing was controlled for between groups.

Results:

A total of 124 patients met inclusion criteria. Group 4 had significantly longer average operative times than Groups 1, 2 and 3 (842 ± 151 min versus 703 ± 127, 690 ± 134, 733 ± 78, respectively, $p<0.05$). Group 4 had a significantly higher rate of delayed wound healing at the donor site when compared to Groups 1-3 (40% versus 6%, 3%, and 6%, respectively, $p<0.05$). Similarly, Group 4 had a significantly higher infection rate at the recipient site, 20% versus 3% for Group 1 ($p>0.05$).

Conclusions:

Our study shows that a BMI $>40kg/m^2$ is associated with an overall 100 minutes longer operative time when compared to the other three populations. A BMI $>40kg/m^2$ is also associated with increased risk for delayed wound healing and infection; however, these complications can typically be managed non-operatively and as an outpatient with minimal morbidity. While a more technically demanding approach, especially in the obese patient, autologous breast reconstruction with abdominal flaps has been shown to produce an aesthetic breast mound that is arguably superior to implant-based breast reconstructions. Although morbid obesity should not be considered an absolute contraindication to autologous breast reconstruction, plastic surgeons should be aware and prepared for longer operative times in those with a BMI $>40kg/m^2$ and counsel their patients accordingly.

7:04 AM - 7:08 AM
Stabilization of Radiation-Induced Skin Changes after Post-Mastectomy Radiotherapy
University of Michigan, Ann Arbor, MI, USA
Theodore A. Kung, MD; Kelley M. Kidwell, PhD; Judy C. Pang, MD; Reshma Jagsi, MD; Lisa A. Newman, MD; Edwin G. Wilkins, MD; Adeyiza O. Momoh, MD; University of Michigan

PURPOSE: Delayed autologous breast reconstruction is commonly recommended in patients requiring post-mastectomy radiation. However, the optimum length of time between radiotherapy and reconstruction has not been determined. This study examines gross and histologic changes in the breast skin of patients who have undergone post-mastectomy radiation to help determine when radiation-induced skin changes begin to stabilize.
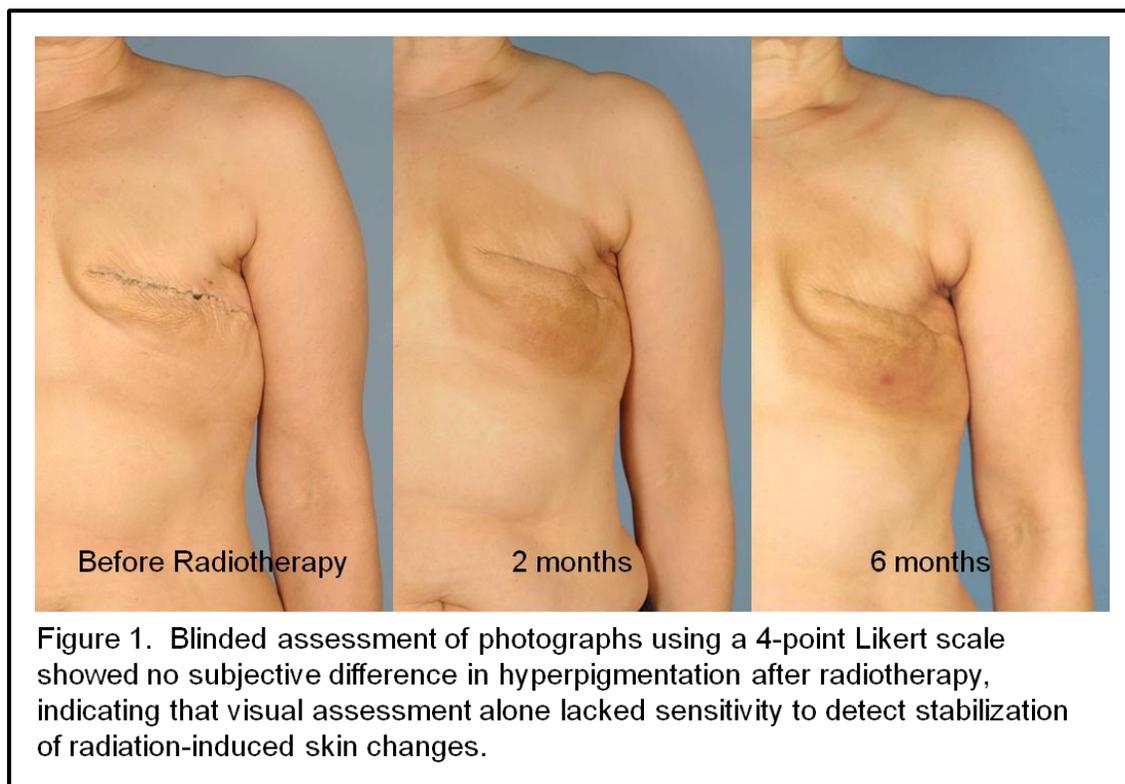
METHODS: A prospective study was conducted on 8 female patients with invasive breast cancer who required mastectomy followed by radiotherapy to the chest wall and regional lymph nodes. At the time of mastectomy and at 2, 4, 6, 8, and 12 month time points after completion of radiotherapy, a single 3 mm punch biopsy was taken from the irradiated mastectomy skin of each patient. Serial standardized photographs were taken before and after radiotherapy to evaluate the degree of hyperpigmentation. Photographs were graded by two blinded plastic surgeons using a validated 4-point Likert scale. Skin biopsies were processed for histologic assessment of inflammation, elastin organization, and vascularity.

RESULTS: Grading of patient photographs revealed an increase in hyperpigmentation after radiotherapy compared to baseline without a significant difference in appearance between post-radiation time points (Figure 1). Smad3 immunostaining demonstrated a trend towards an increase in inflammation throughout the study period. Elastin content within samples was

evaluated through Van Gieson staining and revealed a progressive increase in fiber disorganization, thickening, and clumping which peaked at 4 months (Figure 2). Vascularity was appraised by performing vessel counts per high powered field within the breast skin dermis. At 4 months after radiotherapy, the average number of vessels was lower and this trend was stable over the duration of the study.

CONCLUSIONS: Post-mastectomy radiation results in variable changes in the breast skin. Visual examination alone is not a sensitive measure to determine when stabilization of radiation-induced change has occurred. Histologic examination of the skin reveals dermal changes in inflammation, elastin organization, and vascularity and suggests that stabilization may begin at approximately 4 months after radiotherapy. Further studies will seek to correlate these histologic findings to clinical outcomes of delayed autologous breast reconstruction after post-mastectomy radiotherapy.

Before Radiotherapy   2 months   6 months

Figure 1. Blinded assessment of photographs using a 4-point Likert scale showed no subjective difference in hyperpigmentation after radiotherapy, indicating that visual assessment alone lacked sensitivity to detect stabilization of radiation-induced skin changes.
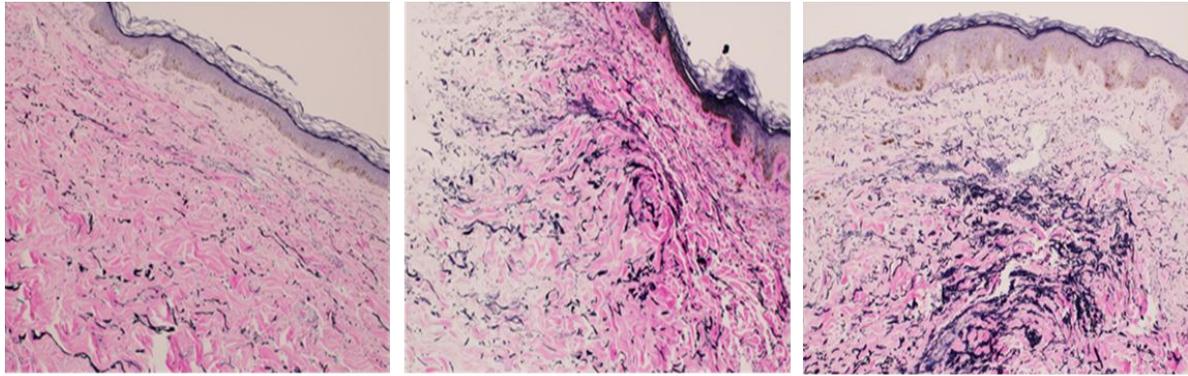
Figure 2. Van Gieson staining at the time of mastectomy (left) showing relatively uniform distribution of elastin fibers within the superficial dermis. Elastin fibers at 2 months (middle) and 8 months (right) after radiotherapy demonstrate progressive disorganization, thickening, and fiber clumping (original magnification, x 10).

7:08 AM - 7:12 AM
A Propensity-Matched Analysis of the Influence of Breast Reconstruction on Subsequent Development of Lymphedema
University of Pennsylvania Health System, Philadelphia, PA, USA
Marten N. Basta, BA; John P. Fischer, MD; Joshua Fosnot, MD; Liza C. Wu, MD; Joseph M. Serletti, MD; Stephen J. Kovach, MD; Julia C. Tchou, MD, PhD; Yun Li, BS; Suhail K. Kanchwala, MD; Perelman School of Medicine at the University of Pennyslvania

Background

Lymphedema is a well-established complication of operative breast cancer treatment, particularly after axillary lymphadenectomy. Lymphedema predisposes patients to infectious complications, is physically debilitating, and significantly diminishes quality of life. Recent literature demonstrates breast reconstruction is associated with a lower incidence of lymphedema and prolonged time to its development. However, due to significant limitations in prior studies, the influence of reconstruction remains highly debated. This study aims to compare the incidence of lymphedema after axillary dissection in a propensity-matched cohort of patients with and without immediate breast reconstruction.

Methods

A review of patients with breast cancer undergoing axillary lymphadenectomy from 1/1/2000-6/1/2013 was conducted. Patients with delayed reconstruction were excluded. Baseline demographics, comorbidities, and neoadjuvant/adjuvant chemotherapy or radiation were collected. Operative characteristics included mastectomy laterality, reconstructive modality, pathologic stage, and number of axillary nodes removed. The primary outcome, post-operative lymphedema, was defined by ICD-9 diagnosis. Univariate analysis of demographic and operative characteristics was performed to identify baseline differences in patients undergoing

reconstruction versus those who did not. Subsequently, each cohort was propensity-matched on the basis of age, obesity (BMI≥30 kg/m^2), unilateral/bilateral mastectomy, cardiovascular disease, and hypertension. Among the matched cohorts, factors significantly associated with lymphedema in bivariate analysis were entered into a multivariate regression to identify independent predictors of lymphedema.

Results

Of 4,647 patients diagnosed with breast cancer, axillary lymphadenectomy was performed in 2,296 patients. Overall, 928 patients had no breast reconstruction, 979 had immediate autologous reconstruction, and 389 immediate implant-based reconstruction. Propensity-score matching yielded 234 patients without reconstruction and 234 undergoing reconstruction. Among the matched cohorts, only chronic kidney and pulmonary disease remained more common in patients without reconstruction.

The incidence of lymphedema among matched cohorts was 26.1%, and average time to diagnosis was 27.7±23.6 months postoperatively. Obesity, hypertension, bilateral mastectomy, presence of two or more comorbidities, preoperative chemotherapy, radiation, and post-operative radiation significantly increased risk of lymphedema. Multivariate adjusted regression demonstrated that only obesity (OR=2.42, p<0.0001) and post-operative radiation (OR=3.14, p<0.0001) were predictive of lymphedema, although bilateral mastectomy approached significance (OR=1.84, p=0.074). Reconstruction was associated with a slightly lower incidence of lymphedema (OR=0.95, p=0.83).

Conclusions

The overall incidence of lymphedema after axillary dissection was 26.1%. Propensity-matched comparison showed that breast reconstruction, regardless of modality, does not significantly alter the development of lymphedema, while post-operative radiation and obesity greatly increase lymphedema risk. These evidence-based findings may enhance pre-operative guidance and better inform patient selection in order to mitigate lymphedema-related complications.
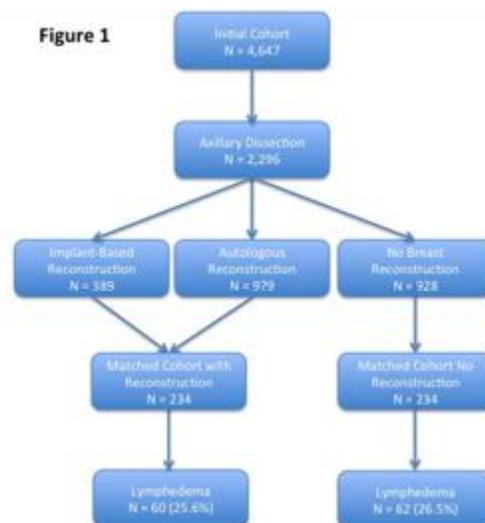

Figure 1

Figure 2: Factors Significantly Associated with Development of Lymphedema, Unadjusted Odds Ratios And Multivariate Regression Adjusted Odds Ratios

Factor	Unadjusted OR (95% CI)	Incidence – No Lymphedema (N = 346)	Incidence – Lymphedema (N = 122)	Unadjusted P Value	Adjusted OR (95% CI)	Adjusted P Value
Obesity (BMI>30)	2.70 (1.77 – 4.12)	18.6%	38.2%	<0.0001	2.42 (1.52 – 3.85)	<0.0001
Post-Op Radiation	3.76 (2.36 – 5.97)	19.8%	48.1%	<0.0001	3.14 (1.90 – 5.19)	<0.0001
Hypertension	1.93 (1.27 – 2.93)	20.2%	32.9%	0.002	1.32 (0.83 – 2.11)	0.243
Preop Chemotherapy	2.92 (1.67 – 5.10)	23.0%	46.7%	<0.0001	1.55 (0.78 – 3.08)	0.206
Preop Radiation	2.82 (1.58 – 5.04)	23.4%	46.3%	<0.0001	1.65 (0.82 – 3.32)	0.160
Two + Comorbidities	1.80 (1.10 – 2.95)	23.7%	36.0%	0.018	1.17 (0.67 – 2.08)	0.589
Bilateral Mastectomy	1.89 (1.02 – 3.50)	17.1%	28.0%	0.041	1.84 (0.94 – 3.60)	0.074

7:12 AM - 7:18 AM
Discussion

7:18 AM - 7:22 AM
First Report and Case Series of the Perforator Dcia FLAP for Breast Reconstruction
University of Manitoba, Winnipeg, MB, Canada
Edward Wayne Buchel, MD; Thomas E.J. Hayakawa, MD, FRCSC; University of Manitoba
1.Purpose

The deep circumflex iliac artery (DCIA) flap was first described in 1979 by Taylor. As the main supply of the groin flap and free osteocuteaneous flap, its donor site morbidity and difficult harvest limited its use. Hartrampth described the "Rubens" flap in 1998 as a myocutaneous flap. In 2007 Morris described the anatomic basis of the DCIA perforator flap, as a potential way to lengthen the pedicle for the osteocutaneous flaps.. Recently we introduced the perforator DCIA flap for autologous breast reconstruction. The purpose is to document a harvest technique, ICG perfusion results, indications, and outcomes of the perforator DCIA flap.

2. Method

The study is a retrospective review of our first 20 consecutive perforator DCIA flaps in breast reconstruction. The flap was used either as the sole method of reconstruction, or in combination with a DIEP flap as part of a 2 flap to one breast method of reconstruction. Indications were either absence of DIEP perforators, or insufficient tissue requiring the recruitment of the adjacent DCIA perforatorsome

3. Results

Thirty consecutive DCIA flaps were reviewed. Patient's ages average BMI, smoking history, and medical comorbidities were recorded. 90 % percentage were bilateral reconstructions. Four patients had prior harvest of the abdominal tissue, while 14 did not have enough anterior abdominal tissue for the required reconstruction. Average pedicle length measured 6 cm with 1.5 and 2.0 mm artery and vein diameters respectfully.

All flaps survived. Reconstructed breast volumes were subjectively equivalent or greater than the original breast volumes. Donor site complications occurred in 2 of 12 patients. One emergent return to the OR occurred for pedicle twisting. .

4. Conclusions

The perforator DCIA flap is an excellent option for secondary autologous breast reconstruction when anterior abdominal tissue is unavailable or as a DIEP-DCIA combination flap for increased volume. Knowledge of the perforator anatomy limits donor morbidity,expedites harvest , allowing for rapid reliable flap transfers.

5. Learning Objectives

1. Describe the anatomy of the DCIA perforator flap

2. Understand the indications for the perforator DCIA flap in autologous breast reconstruction.

3. Understand the limitations of the DCIA perforator flap in autologous breast reconstruction.

7:22 AM - 7:26 AM
Breast Surface Area Predicts Skin Necrosis in Immediate Breast Reconstruction Following Mastectomy
Division of Plastic Surgery, Department of Surgery New York Pres, New York , NY, USA
Leslie Erin Cohen, MD; Lily R. Mundy, BS; Andrew L. Weinstein, MD; David M. Otterburn, MD; New York Presbyterian Hospital/ Weill Cornell Medical College
Identification of patients at high-risk for skin necrosis after mastectomy reconstruction is critical to prevent poor cosmetic outcomes and re-operation. Known risk factors include tobacco usage and pre-operative radiation; however, it is unclear if preoperative patient characteristics or type of reconstruction predispose a patient to necrosis. This study aimed to investigate if surface area of the breast, type of mastectomy incision, or reconstruction were predictors of postoperative breast skin necrosis.

A retrospective chart review of 219 patients undergoing mastectomies with reconstruction by a single plastic surgeon over three years was performed. Patient's demographics, and associated co-morbidities were recorded. Surgical factors including location of mastectomy incision and type of reconstruction (tissue expander, direct to implant, latissimus dorsi, pedicled TRAM, and DIEP) were recorded. Surface area of the breast was calculated using the patient's pre-operative

breast measurements to approximate the surface area of a cone (without base). Outcomes measured were; minor necrosis, and necrosis affecting outcome of the final reconstruction.

24% of patients (53) had skin necrosis, 39.6% (21) of this cohort affected final outcome. The mean age was 48 ± 11, mean BMI 26 ± 5, while mean breast surface area was 222 ± 64cm^2. Multivariate analysis showed advanced age (OR: 1.04, 95%CI [1.01, 1.07]), higher BMI (OR: 1.09, 95%CI [1.02, 1.15]), and pre-operative radiation (OR: 5.66, 95%CI [1.31, 24.54]) were significant predictors of skin necrosis, while pre-operative B cup measurement was protective (OR: 0.27, 95%CI [0.09, 0.81]). Specifically, the rates of necrosis for patients with age <40 and BMI <26 were significantly lower compared to age >40 and BMI >26 (12% vs. 28% and 19% vs. 33%, respectively, p<0.05). Importantly, pre-operative breast surface area >230cm^2 had higher rates of necrosis compared to <230cm^2(32% vs. 19%, p=0.04). Choice of reconstruction correlated with outcomes on multivariate analysis: patients undergoing tissue expander placement were less likely to suffer skin necrosis (OR: 0.45, 95%CI [0.24, 0.83]), while those undergoing immediate DIEP flaps were at higher risk (OR: 2.7, 95%CI [1.4, 5.0]). Lastly, location of mastectomy incision was not a predictor of skin necrosis.

Patients with age >40, BMI >26, pre-operative radiation, and breast surface area >230cm^2 are at higher risk for postoperative skin necrosis. Additionally, immediate microvascular DIEP reconstruction is associated with skin flap necrosis, while tissue expander placement is protective. This identifies a subset of higher-risk patients who may benefit from tissue expander placement as the initial step toward their final reconstruction.

Breast, Tuesday January 27, 2015, 7:00am-8:45am
7:26 AM - 7:30 AM
Bilateral Mastectomy versus Breast-Conserving Surgery for Early Stage Breast Cancer: The Role of Breast Reconstruction
Memorial Sloan Kettering Cancer Center, New York, NY, USA

Claudia R. Albornoz[1]; Evan Matros[1]; Clara Lee[2]; Clifford A. Hudis, MD[3]; Andrea Pusic, MD, MHS[1]; Elena B. Elkin, BS, PhD[1]; Peter B. Bach[1]; Peter G. Cordeiro, MD[1]; Monica Morrow, MD[1]; (1)Memorial Sloan Kettering Cancer Center, (2)University of North Carolina, (3)Memorial Sloan kettering Cancer Center

Background: Although breast conserving surgery (BCS) is oncologically safe for women with early stage breast cancer (ESBC), mastectomy rates in the US are increasing. We examined the role of breast reconstruction on the surgical management of ESBC.

Methods: Women diagnosed with unilateral ESBC between 1998 and 2011 were identified in the National Cancer Data Base. Rates of BCS, unilateral (UM), and bilateral mastectomy with contralateral prophylactic procedures (CPM) per 1,000 cases were estimated. Time trends were analyzed using Poisson regression. The association between breast reconstruction rates and surgical treatment was evaluated using a multinomial logistic regression, controlling for demographic and disease characteristics. Contribution of breast reconstruction to the odds to have a CPM or UM instead of BCS was estimated.

Results: A total of 1,856,702 patients were included. Mastectomy rates decreased from 459 per 1,000 in 1998 to 360 per 1,000 in 2005 ($p<0.01$ for trend), increasing thereafter to 403 per 1,000 in 2011($p<0.01$). The rise in mastectomy rates after 2005 reflects a 14% annual increase in the rate of CPM ($p<0.01$), as UM rates did not change significantly (Figure 1). Each percentage point increase in the national rate of breast reconstruction was associated with a 6% increase in the probability of CPM, controlling for patient and disease characteristics. The greatest proportion of variation in CPM rates was explained by young age (32%), breast reconstruction (29%), and stage 0 (5%) [Table 1].

Conclusion: Since 2005 an increasing proportion of ESBC patients have chosen mastectomy instead of BCS. This trend reflects a shift towards bilateral mastectomy with CPM. Greater breast reconstruction rates may facilitate more aggressive surgery in the form of CPM.

Figure 1. Trends in surgery for early-stage breast cancer, 1998-2011
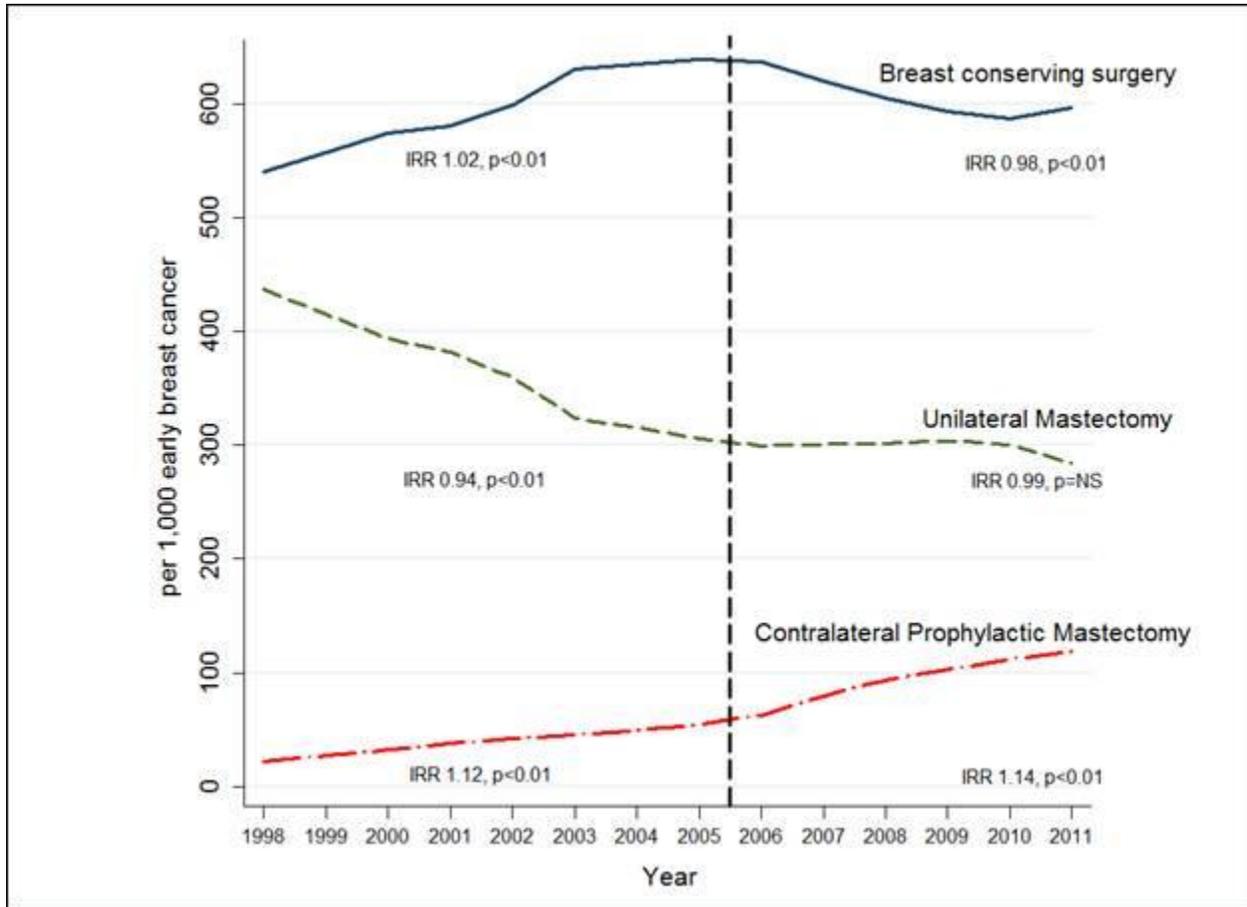

IRR, incidence rate ratio

Table 1. Variabilty in contralateral prophylactic mastectomy use (compared to BCS) explained by patient, disease and area characteristics

Characteristic	% of variation explained

Young age	32
Breast reconstruction	29
Stage 0 (DCIS)	5
Lobular histology	4
Race	4
Tumor size	4
Facility location	3

Only variables that changed the pseudo R^2 by $\geq 2\%$ are shown. Pseudo R^2 of 0.1274, c-statistic 0.75, n=1,149,395.

7:30 AM - 7:36 AM
Discussion

7:36 AM - 7:40 AM
Early Experience with the Free Lumbar Artery Perforator Flap for Breast Reconstruction
University Hospital of Gent, Gent, , Belgium
Kevin Peters, MD; Phillip Blondeel, MD, PhD; Koen Van Landuyt, MD, PhD; Gent University Hospital

Introduction and Aims

Autologous breast reconstruction has become the preferred method of breast reconstruction. Different flaps have been described and subsequently refined to decrease donor site morbidity. In 2003, the lumbar artery perforator (LAP) flap was introduced as an option for autologous breast reconstruction.(1) Since this case report, no large series have been described in literature.

The DIEAP flap remains the golden standard for breast reconstruction. However, in case of a previous abdominoplasty or DIEAP flap, excessive abdominal scarring or insufficient abdominal adipose tissue a LAP flap can be an excellent alternative. The donor scar does not distort the buttock contour unlike in the SGAP or IGAP flaps. (2) (FIG1)

Material and Methods

Since October 2010 we reconstructed 26 breasts in 21 patients using the free LAP flap. Data were prospectively recorded to include patient parameters; flap characteristics and post-operative complications.

Key Results

The average weight of the flap was 543,4 grams. An interposition graft taken from the deep inferior epigastric vessels was necessary in 19 cases (73%). The mean operating time was 6 h 31

min (range 3 h 50 min – 10 h 50 min). Five flaps had to be revised due to venous thrombosis. No arterial problems were encountered. Two of the revised flaps were lost. Minor complications were seroma formation at the level of the donor site (n=6) and minor wound dehiscence (n=1).

Conclusion

The lumbar artery perforator flap should be considered as a good alternative for breast reconstruction in patients in whom a DIEAP flap is not possible. (FIG 2) Shaping of the flap is easier compared to the DIEAP or SGAP flap, due to the quality of the lumbar fat and the gluteal extension. (FIG 3) Frequently an interposition graft is necessary which is a considerable disadvantage of this flap adding morbidity to other regions of the body and increasing operating time.

References

1. de Weerd L, Elvenes OP, Strandenes E, Weum S. Autologous breast reconstruction with a free lumbar artery perforator flap. Br J Plast Surg. 2003 Mar;56(2):180-3.
2. Blondeel PN. The sensate free superior gluteal artery perforator (S-GAP) flap: a valuable anternative in autologous breast reconstruction. Br J Plast Surg. 1999 Apr;52(3):185-93.

7:40 AM - 7:44 AM
Effect of Obesity on Procedure Selection and Satisfaction with Breast Cancer Procedures
Duke University Medical Center, Durham, NC, USA

Erin L. Doren[1]; Amy P. Abernethy, MD[2]; Michael R. Zenn, MD[2]; Gregory Georgiade, MD[3]; David J. Smith, MD[1]; Dunya M. Atisha, MD[1]; (1)University of South Florida, (2)Duke University, (3)Duke University Medical Center

Background:

The incidence and prevalence of breast cancer and obesity continue to rise. Previous studies have shown that body mass index (BMI) predicts patient satisfaction with breast reconstruction (BR). Does BMI influence procedure type and satisfaction with all breast cancer procedures?

Methods:

The Army of Women (AOW) comprises over 360,000 women who voluntarily participate in breast cancer research. Women enrolled with history of breast cancer surgery were recruited to take surveys including; BREAST-Q$^©$, PTSD checklist, Impact of Cancer scale, and demographic survey. Patient data was classified by BMI. Regression analysis was used to evaluate effect of procedure type on breast satisfaction for each BMI category.

Results:

7,568 women completed all surveys. Distribution of procedure type by BMI differed significantly (Table1). As BMI increased, the overall rate of mastectomy increased ($p<0.0001$) and the rate of reconstruction decreased ($p<0.0001$). There was also a direct linear correlation

with increasing weight category and complication rates. Despite this, overweight, obese, and morbidly obese women reported similar satisfaction with BR compared to breast conservation surgery (BCS), whereas low and normal weight categories of women reported lower satisfaction with BR compared to BCS (Table2). Regression analysis revealed that compared to BCS, all weight categories experienced higher satisfaction with abdominal flap reconstruction (p<0.0001,Figure1). Additionally, women in all weight categories reported the lowest satisfaction with mastectomy alone compared to BCS (p<0.0001).

Conclusions:

Women with larger BMI experience significantly higher rates of mastectomy alone without reconstruction despite having higher satisfaction with autologous tissue reconstruction compared to BCS. This supports the notion that all patients being considered for mastectomy should be referred to a plastic surgeon for evaluation and plastic surgeons should highly consider use of abdominal flap reconstruction in this population, despite increased risk of complications.

Table 1:

Procedure Type by BMI category (n= 7,568;p<0.0001)

BMI	BCS (n= 3477)	Mastectomy (n=1259)	Breast Reconstruction (n= 2307)	Complex (n=509)	Total
Low <18.5 kg/m^2 (n=108)	37.04%	12.04%	45.37%	5.56%	1.43%
Normal 18.5-24.99 kg/m^2 (n=3407)	44.09%	15.23%	33.87%	6.81%	45.02%
Overweight 25-29.99 kg/m^2 (n=2309)	47.12%	16.59%	29.62%	6.67%	30.51%
Obese 30-34.99 kg/m^2	49.73%	18.03%	26.32%	5.92%	14.51%

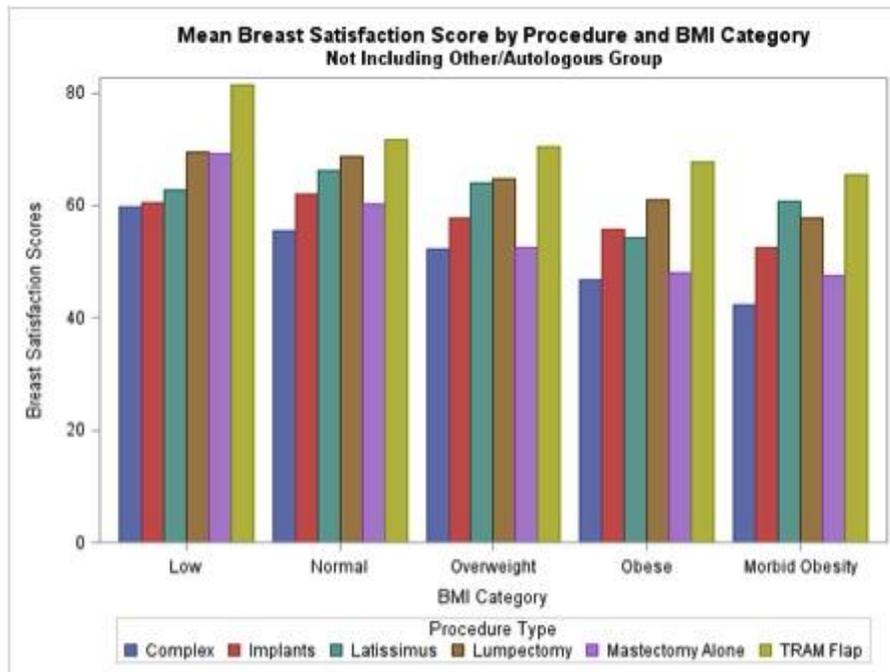| (n=1098)					
Morbid Obesity >35 kg/m^2 (n=646)	47.52%	24.15%	28.33%	8.36%	8.54%

Table 2:

Mean Breast Satisfaction Score(0-100) Mean(sd)

(P-values range from 0.0095 to< 0.000)

BMI	BCS (n=3477)	Mastectomy (n=1259)	Breast Reconstruction (n=2307)	Complex (n=509)	Total
Low (n=108)	69.4(21.1)	69.2(28.8)	62.3(18.5)	59.8(24.9)	65.6(21.2)
Normal (n=3404)	68.7(20.9)	60.3(20.2)	63.9(17.5)	55.4(21.0)	64.9(20.1)
Overweight (n=2301)	64.7(21.9)	52.3(19.1)	63.1(19.3)	52.4(21.9)	61.4(21.3)
Obese (n=1094)	60.9(21.8)	48.0(17.4)	60.2(21.6)	46.7(22.0)	57.6(21.7)
Morbid Obesity (n=645)	57.8(22.7)	47.1(21.1)	57.6(19.3)	42.4(24.3)	54.0(22.5)

Figure 1:

Mean Breast Satisfaction Score by Procedure and BMI Category
Not Including Other/Autologous Group

BMI Category

Procedure Type: Complex, Implants, Latissimus, Lumpectomy, Mastectomy Alone, TRAM Flap

7:44 AM - 7:48 AM
Patient-Reported Satisfaction and Health-Related Quality of Life Following Microvascular Perforator Flap Breast Reconstruction
Plastic and Reconstructive Microsurgical Associates, San Antonio, TX, USA
Oscar Ochoa, MD; Steven Pisano; Minas Chrysopoulo; Peter Ledoux; Gary Arishita; Jessica Belz; Chet Nastala; PRMA Plastic Surgery
Introduction: Autologous abdominal-based reconstruction is widely considered the gold standard in breast reconstruction. Moreover, advanced microvascular breast reconstruction with deep inferior epigastric perforator (DIEP) flaps have gained considerable popularity due to decreased donor-site morbidity and improved abdominal wall stability. Although outcome measures based on objective clinical data have been previously reported, studies analyzing perceived outcomes and health-related quality of life as reported by patients are significantly lacking. The recent introduction of the Breast-Q® questionnaire has facilitated quantifying patient-reported outcomes promising improvement in the patient decision-making process and quality of care.

Methods: Consecutive patients undergoing DIEP flap breast reconstruction prospectively completed Breast-Q® questionnaires pre-operatively and at two points post-operatively. The first post-operative questionnaire was completed approximately one month following reconstruction. The second post-operative questionnaire was completed following nipple reconstruction and micro-pigmentation. Post-operative flap and donor-site complications were recorded prospectively and classified as major and/or minor. Pre- and post-operative Breast-Q® scores were compared at all time points and stratified by age, BMI, timing of reconstruction, and incidence of major and minor complications.

Results: Between February 2012 to November 2013, 37 patients undergoing DIEP flap reconstruction were enrolled in the study. Mean patient age was 52 years (37-70 years) with a mean BMI of 28 (22-40). A total of 67 DIEP flaps were performed on the study population. Bilateral reconstruction was performed on 30 (81%) patients. Seven (19%) patients underwent delayed reconstruction of at least one breast. Immediate reconstruction was performed on the remainder 30 (81%) patients. No flap losses were recorded. Incidence of flap and donor-site complications was 35% and 59%, respectively. Overall, patients reported consistent improvement in breast satisfaction, psychosocial, and sexual well-being during both post-operative points compared to baseline. Similar trends were seen irrespective of patient age or timing of reconstruction. Patients undergoing delayed breast reconstruction reported equivalent satisfaction with breast appearance and greater improvement in psychosocial well-being when compared to patients undergoing immediate reconstruction. Increasing BMI was associated with greater improvements in breast appearance, psychosocial, and sexual well-being compared to baseline. Patients who experienced minor post-operative complications did not report decreased satisfaction or quality of life compared to those without complications.

Conclusion: In this prospective study, patient-reported outcomes demonstrate significant and consistent improvements in quality of life and breast satisfaction among patients following deep inferior perforator flap reconstruction. Patients with higher BMI and those undergoing delayed breast reconstruction report the greatest improvements in satisfaction and well-being following breast reconstruction.

7:48 AM - 7:54 AM
Discussion

7:54 AM - 7:58 AM
Evolution from the TUG to PAP Flap for Breast Reconstruction: Comparison and Refinements of Technique
St Thomas' Hospital, London, , United Kingdom
Judith E. Hunter, MA/D, FRCS(Plast); David Rory Dower; Alessia Lardi; Jian Farhadi; St Thomas' Hospital
Introduction: The transverse upper gracilis (TUG) flap is a good alternative for autologous breast reconstruction. Limitations, however, include: short pedicle, modest volume, muscle sacrifice and a problematic donor site. The Profunda Artery Perforator (PAP) flap, utilizes large perforators posterior to the gracilis muscle, harvesting posterior thigh adipose. We describe our preliminary experience of its use and compare it to our large series of TUG flaps.

Method: We obtain imaging on all patients for whom a PAP flap reconstruction is planned. Having visualized potential perforators, we raise the flap in the 'frog-leg' or lithotomy position, negating the need for patient turning. In the first part of the series, the flap was raised from anterior to posterior; if the perforators were deemed insufficient to base a flap on intra-operatively, Inferior Gluteal Artery perforators (IGAP) were still available for use as a bail out. As our technique has evolved, we now raise from caudal to cranial allowing either the TUG or

IGAP as alternatives. A prospective database of all free flap breast reconstructions performed by the senior author was utilized to compare TUG and PAP flaps undertaken between 2010-2014.

Results: 54 TUG and 22 PAP flaps were performed. 4 PAP flaps were converted to IGAP flaps and 1 to TUG intra-operatively. 97% of all flaps were successful. The PAP flap allowed greater flexibility in inset compared to the TUG flaps. Mean flap weight was 295g (TUG) and 227g (PAP). Donor site complications included 4 seromas, 2 neuropraxias with 3 scar revisions for the TUG series. We have had 1 seroma, 1 neuropraxia and 1 donor wound dehiscence in the PAP flaps.

Conclusion: Our preliminary experience of the PAP flap has been cautiously favourable compared to the TUG flap. Although it is a more challenging flap to raise, it does have the benefits of a longer pedicle, without the need to sacrifice muscle; the perforators should have a more defined and larger perfusion zone, with larger potential adipose harvest, ease of flap inset, better hidden scar and possibly less donor site problems.

7:58 AM - 8:02 AM
Predictors of Unplanned Reoperation and Unplanned Readmission in Patients Undergoing Free Flap Breast Reconstruction, Using The American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) Database
Johns Hopkins Hospital, Baltimore, MD, USA
John Curran, MBBS, FRCS[1]; Anne Tong Jia Wei, MBBS[2]; Onyebuchi U. Ogbuagu, MD, MPH[3]; James Alsobrooks, BA[1]; Chris Devulapalli, MD[4]; Pablo Baltodano, MD[5]; Carisa Cooney, MPH[2]; Michelle A. Manahan, MD[1]; Gedge D. Rosson[1]; (1)Johns Hopkins Hospital, (2)The Johns Hopkins Hospital, (3)Johns Hopkins School of Public Health, (4)MedStar Georgetown University Hospital, (5)Johns Hopkins University

Background

 Autologous free-flap breast reconstruction improves quality of life in breast cancer patients who undergo mastectomy. Unplanned reoperation and hospital readmission in surgery pose major clinical and financial burdens on the health care system. A risk stratification of this group can help allocate these costly resources. This mandates a large, multi-institutional study that evaluates predictors of unplanned reoperation and readmission in patients undergoing autologous free-flap breast reconstruction. Our study investigates preoperative, intraoperative, and postoperative risk factors for unplanned reoperation and hospital readmission in patients undergoing free-flap breast reconstruction within a 30 day postoperative period.

Methods

 Using the ACS-NSQIP dataset (a prospective, risk adjusted, outcomes-based registry), we analyzed all females undergoing breast reconstruction surgery with autologous free flaps from 2011-2012. Patient demographics, comorbidities, operative data, and surgical outcomes were analyzed. The primary outcome was unplanned return to the OR and secondary outcome was unplanned hospital readmission, both within 30 days of the index reconstructive procedure.

Multivariable logistic regression was performed to observe for independent risk factors for unplanned reoperations or readmissions related to the index surgery.

Results

A total of 1643 autologous flap breast reconstruction procedures were included. Unplanned reoperation occurred in 12.7% (n=208), and unplanned readmission occurred in 7.1% (n=116). Logistic regression analysis demonstrated Body Mass Index (BMI) and increased operative time to be associated with increased rates of unplanned reoperation and readmission (OR: 1.05 , OR: 3.14 respectively, p<0.05). Multivariate regression analysis identified diabetes mellitus(OR: 2.07 , P= 0.003), hypertension (OR= 1.03 , P = 0.04) and COPD (OR: 3.08 , P = 0.058) as potential independent risk factors associated with unplanned readmission only. Of the postoperative complications, wound infection, wound dehiscence, pneumonia and sepsis were identified as independent predictors of increased rates of both unplanned reoperation and unplanned readmission **(Tables 1-2).** Interestingly, length of stay following the index reconstructive operation was not predictive of future readmissions.

Conclusions

A history of diabetes mellitus, hypertension and COPD proved to be significant risk factors for unplanned readmission. Interventions focused on early recognition and optimization of specific cohort demographics, comorbidities and operative factors could help reduce unplanned reoperation and readmission rates associated with autologous free-flap breast reconstruction. Recognition of these risk factors can not only guide the reconstructive surgeon in selecting the appropriate breast reconstruction option for these patients but also accurately counsel them regarding their postoperative outcomes.

Table 1: Reoperation

UNIVARIATE LOGISTIC REGRESSION

	Odds Ratio	P value
Demographics		
Ethnicity		
Black	1.505	0.064
Comorbidities		
Body Mass Index	1.03	0.013
Intraoperative Factors		
Duration of surgery (minutes)	1.001	0.003
Level of residency supervision		
Attending Alone	Ref	-
Attending & Resident	1.8	0.071
Postoperative factors		
Any wound infections	3.18	< 0.0001
Wound dehiscence	6.697	< 0.0001
Pneumonia	6.985	0.018
Sepsis	9.36	0.004
Readmission for any reason	6.031	< 0. 0001
Length of Stay (Days)	1.014	0.127
MULTIVARIATE LOGISTIC REGRESSION		
Readmission for any reason	5.53	< 0. 0001
Wound dehiscence	4.43	0.001

P-value < 0.05

Table 2: Unplanned Readmission

UNIVARIATE LOGISTIC REGRESSION

Demographics	Odds Ratio	P-value
Ethnicity		
Black	1.15	0.626
Comorbidities		
Body Mass Index	1.05	0.001
Diabetes Mellitus	3.14	< 0.0001
Hypertension requiring medication	1.77	0.005
Chronic Obstructive Pulmonary Disease	4.478	0.026
Intraoperative Factors		
Duration of surgery (minutes)	1.001	0.017
Level of residency supervision		
Attending Alone	Ref	-
Attending & Resident	1.184	0.667
Postoperative Factors		
Any wound infection	21.19	< 0.0001
Wound dehiscence	7.943	< 0.0001
Length of stay (days)	1.0005	0.939
Pneumonia	27.23	< 0.0001
Venous thromboembolism	40.559	< 0.0001
Sepsis	34.35	< 0.0001
Reoperation	6.031	< 0.0001

MULTIVARIATE LOGISTIC REGRESSION

Comorbidities		
Diabetes Melitus	2.097	0.033
Body Mass Index	1.032	0.046
Operation Time (in minutes)	1.001	0.015
Hypertension requiring medications	1.5	0.06
Chronic Obstructive Pulmonary Disease	3.81	0.058
Postoperative Factors		
Venous thromboembolism	34.055	< 0.0001
Pneumonia	26.62	< 0.0001
Wound Dehiscence	6.415	< 0.0001
Sepsis	17.48	0.003

P-value < 0.05

8:02 AM - 8:06 AM
Immediate Reconstruction of the Radiated Breast- Recent Trends Contrary to Traditional Standards
University of Michigan, Ann Arbor, MI, USA

Shailesh Agarwal, MD; Kelley Kidwell, PhD; Matthew Chetta, MD; Jeffrey H. Kozlow, MD MS; Kevin C. Chung, MD MS; Adeyiza O. Momoh, MD; University of Michigan

ABSTRACT

BACKGROUND: Immediate, implant-only breast reconstruction is traditionally discouraged in patients who receive radiation therapy for reasons of the significant morbidity associated with this approach. It is not clear however, whether this widely-recognized mantra of breast reconstruction is actually currently observed in practice. The aim of this study is thus to evaluate reconstruction trends and practices in breast cancer patients who have undergone mastectomy and radiation therapy.

METHODS: Female patients with unilateral breast cancer who required radiation therapy in addition to mastectomy were extracted from the Surveillance, Epidemiology, and End Results (SEER) database from 2000 through 2010. Patients who underwent immediate reconstruction were identified and analyzed. Reconstructive techniques from the database were implant only, combined implant-tissue reconstruction and tissue only reconstruction. Bivariate and multivariate logistic regression analyses were performed to study the odds of implant or combined implant-tissue reconstruction over tissue only reconstruction based on specific demographic and oncologic characteristics.

RESULTS: A total of 40,658 female patients were included for analysis. Reconstruction was performed in 6975 patients (17%) who required radiation. Post mastectomy radiation therapy was performed in 98.2% of the patients. The reconstruction rate among patients requiring radiation increased from 13.6% to 25.1% during the study period. The percentage of reconstructed patients who had implant only reconstruction increased from 22% to 42% (r=0.96, p<0.001) with a concomitant decrease in tissue only reconstruction from 42% to 26% (r=-0.90, p<0.001); combined implant-tissue reconstructions remained stable at 12% (Figure 1). Multivariate logistic regression analysis of all reconstructed patients requiring radiation showed that African American patients were less likely than white patients to undergo implant only reconstruction (OR 0.48, 95% CI 0.39-0.60, p<0.0001). We also found that a diagnosis made between 2006-2010 was associated with higher odds of implant-only reconstruction (2010 vs 2000, OR 2.83, 95% CI 2.08-3.86, p<0.0001).

CONCLUSIONS: The frequency of immediate reconstruction continues to increase in the setting of radiation therapy. Our study shows that a larger proportion of patients who require radiation are undergoing immediate implant-based reconstruction, contrary to traditional recommendations. In additions to factors such as cost and the overall increase in use of immediate implant reconstruction, these findings likely reflect a changing attitude towards implant reconstruction in the setting of radiation therapy.

Figure 1: Reconstruction Rates by Method in Radiated Patients from 2000-2010
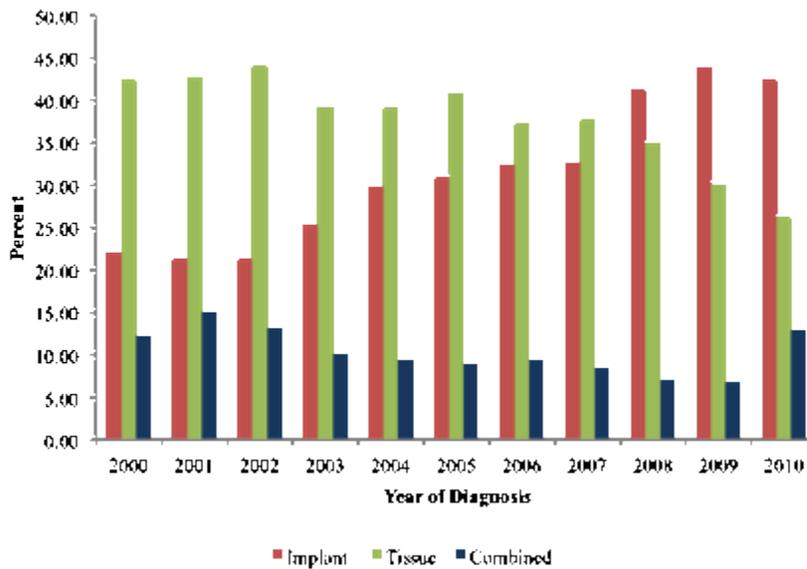
8:06 AM - 8:12 AM
Discussion

8:12 AM - 8:16 AM
Indocyanine Green Laser Angiography Improves Deep Inferior Epigastric Perforator Flap

Outcomes Following Abdominal Liposuction
Mayo Clinic in Arizona, Phoenix, AZ, USA

William Casey, MD[1]; Katharine A Connolly[1]; Alisha Nanda, BS[2]; Alanna M. Rebecca, MD[3]; Galen Perdikis, MD[4]; Anthony Smith[3]; (1)Mayo Clinic in Arizona, (2)University of Arizona College of Medicine - Phoenix Campus, (3)Mayo Clinic Arizona, (4)Mayo Clinic in Florida

Background The reliability of deep inferior epigastric perforator (DIEP) flap reconstruction following abdominal liposuction is controversial. Our early cases were technically successful, however we experienced high partial flap loss and fat necrosis rates when the flaps were assessed intraoperatively using clinical examination. We sought to compare DIEP flap outcomes in the setting of prior liposuction following the utilization of intraoperative indocyanine green (ICG) angiography as opposed to when flaps were assessed on clinical grounds alone.

Methods A retrospective review of a consecutive series of DIEP flaps following liposuction at a single institution was performed, comparing those evaluated on clinical grounds alone and those in which ICG angiography was used intraoperatively. The outcomes measured included anastomotic complications, total flap loss, partial flap loss, fat necrosis, and postoperative abdominal wounds.

Results Thirteen DIEP flaps following prior liposuction were performed for breast reconstruction on eleven patients from July 2003 through January 2014. All patients had preoperative imaging with duplex ultrasound (one patient, bilateral reconstruction) or CT angiography (ten patients, eleven flaps) to analyze perforator suitability prior to surgical exploration. Seven flaps were evaluated intraoperatively on clinical grounds alone. Six flaps were assessed and modified based on intraoperative ICG angiography. All thirteen flaps were successful with no total flap losses or anastomotic complications. Partial flap loss and fat necrosis rates dropped from 71.4% (5 / 7 flaps) in the clinical evaluation group to 0% (0 / 6 flaps) when ICG angiography was employed intraoperatively (p=0.02). In the clinical evaluation group, partial flap loss occurred in five of seven flaps (ranging from 20-50% of overall flap volume) and fat necrosis developed in three of seven flaps. Due to the significant volume loss in the flaps transferred based on clinical grounds alone, four of these seven DIEP flaps required subsequent augmentation with either another autologous flap or prosthetic implant to provide sufficient breast volume and contour. Every flap in the ICG angiography group had the desired volume and contours for reconstruction without requiring any subsequent revisions. All abdominal wounds healed uneventfully.

Conclusion ICG angiography is an excellent vascular imaging modality for intraoperative use to assess flap perfusion and aids in improving outcomes in DIEP flaps when harvested after prior abdominal liposuction. It allows optimal flap design around the chosen perforators and demonstrates areas of sufficient perfusion to be included in the flap, thereby avoiding postoperative complications and possibly the need for additional reconstructive procedures.

8:16 AM - 8:20 AM
The Effect of Timing on Breast Reconstruction Outcomes in Diabetic Women
Johns Hopkins University School of Medicine, Baltimore, MD, USA

Melanie Major, BS; Onyebuchi Ogbuagu; Pablo Baltodano Fallas; Carisa Cooney; Gedge Rosson; The Johns Hopkins University School of Medicine

Purpose: To determine data-driven recommendations for breast reconstruction in diabetic women. Current research suggests diabetes is associated with surgical complications following autologous reconstruction, but not prosthetic reconstruction. However, little is known about the effect of timing on breast reconstruction in the female diabetic patient population.

Methods: We analyzed all diabetic females undergoing breast reconstruction from 2005-2012 in the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database. Patients were identified as immediate breast reconstructions if they had a mastectomy and reconstruction with a prosthesis or autologous flap on the same day and defined as delayed breast reconstructions if they had either type of reconstruction without a mastectomy on the same day. The primary outcome of surgical morbidity was defined as 30-day post-operative superficial surgical site infection (SSI), deep incisional SSI, organ space SSI, wound dehiscence, or flap failure.

Results: 1,408 diabetic women underwent breast reconstruction, including: 156 (11.1%) immediate autologous reconstruction (IAR), 802 (57.0%) immediate prosthetic reconstruction (IPR), 118 (8.4%) delayed autologous reconstruction (DAR), and 332 (23.6%) delayed prosthetic reconstruction (DPR). The immediate and delayed reconstruction groups were similar in pre-surgical characteristics (Table 1). IPR was associated with reduced superficial SSI (OR = 0.320, p = 0.003), deep incisional SSI (OR = 0.320, p = 0.003), and unplanned readmission (OR = 0.317, p = 0.005) compared to IAR. DPR was associated with reduced wound dehiscence (OR = 0.0683, p = 0.015) compared to DAR. The relationship between timing and surgical morbidity did not differ by reconstruction type. A multivariate logistic regression model built using pre-surgical factors and the outcome of surgical morbidity yielded the following as the only statistically significant contributors after controlling for all other factors: autologous flap versus prosthesis (OR = 0.350, p <0.001), immediate versus delayed reconstruction (OR = 0.467, p = 0.018), BMI classifications (data omitted), hypertension (OR = 0.528, p = 0.014), and recent weight loss (OR = 48.477, p = 0.004).

Conclusions: The results of this study suggest delayed breast reconstruction with prosthesis or autologous flap is associated with reduced surgical morbidity compared to both types of immediate reconstruction after controlling for pre-surgical factors. This study further clarifies the breast reconstruction strategy with the lowest 30-day postoperative complications for a female diabetic patient with multiple co-morbidities.

Table 1. Characteristics of diabetic population undergoing breast reconstruction

		Immediate reconstruction, n = 958	Percent total (%)	Delayed reconstruction, n = 450	Percent total (%)	P
Type of reconstruction	Autologous flap	156	16.28	118	26.22	<0.001
	Prosthesis	802	83.72	332	73.78	
Age	Young (<35)	8	0.84	8	1.78	0.242
	Mature I (35 – 49.9)	163	17.01	68	15.11	
	Mature II (50 – 64.9)	536	55.95	266	59.11	
	Elderly (>65)	251	26.20	108	24.00	
Diabetes	Insulin	243	25.37	119	26.44	0.666
	Non-insulin	715	74.63	331	73.56	
BMI	Normal	120	12.57	57	12.75	0.665
	Underweight	4	0.42	1	0.22	
	Overweight	259	27.12	114	25.50	
	Obese I	256	26.81	124	27.74	
	Obese II	179	18.74	97	21.70	
	Obese III	137	14.35	54	12.08	
Dyspnea	No	3	0.31	1	0.22	0.785
	Moderate exertion	75	7.83	31	6.89	
	At rest	880	91.86	418	92.89	
Functional health prior to surgery	Independent	949	99.06	446	99.11	0.427
	Partially dependent	6	0.63	2	0.44	
	Totally dependent	2	0.21	0	0.00	
Smoker	No	863	90.08	400	88.89	0.492
	Yes	95	9.92	50	11.11	
Hypertension	No	287	29.96	133	29.56	0.878
	Yes	671	70.04	317	70.44	
History of COPD	No	939	98.02	440	97.78	0.768
	Yes	19	1.98	10	2.22	
Steroid use	No	939	98.02	446	99.11	0.131
	Yes	19	1.98	4	0.89	
Chemotherapy <30 days prior to surgery	No	730	96.82	215	94.71	0.140
	Yes	24	3.18	12	5.29	
Congestive heart failure	No	957	99.90	450	100.00	0.493
	Yes	1	0.10	0	0.00	
Previous percutaneous coronary intervention	No	726	96.29	221	97.36	0.440
	Yes	28	3.71	6	2.64	
Currently on dialysis	No	953	99.48	449	99.78	0.421
	Yes	5	0.52	1	0.22	
Recent weight loss	No	956	99.79	449	99.78	0.959
	Yes	2	0.21	1	0.22	
Bleeding disorder	No	946	98.75	446	99.11	0.548
	Yes	12	1.25	4	0.89	
History of transient ischemic attack	No	743	98.54	223	98.24	0.744
	Yes	11	1.46	4	1.76	
Preoperative radiation	No	749	99.60	225	99.12	0.372
	Yes	3	0.40	2	0.88	

8:20 AM - 8:24 AM
The Impact of Intraoperative Microvascular Compromise on Outcomes in Microsurgical Breast Reconstruction
The Ohio State University, Columbus, OH, USA
Michelle Coriddi, MD; Albert H. Chao, MD; Ohio State University

Background:

While factors affecting the outcome of free flap take-backs for postoperative microvascular compromise has been previously studied, limited data exists regarding the impact of intraoperative microvascular compromise on free flap outcomes.

Methods:

A retrospective review of all breast free flaps between 2007-2012 was performed. Details of intraoperative microvascular compromise were recorded, including site of compromise (arterial, venous, both), number of microvascular revisions, number and duration of ischemia times, and number and duration of reperfusion intervals, as well as postoperative outcomes. Patients who experienced intraoperative microvascular compromise were compared to all other patients, and to patients who experienced only postoperative microvascular compromise.

Results:

A total of 612 microsurgical breast reconstructions in 442 patients were reviewed. Of these, 68 patients and 73 flaps (15.4%, 11.9% respectively) experienced intraoperative microvascular compromise requiring revision, of which 46 (63.0%) were arterial, 20 (27.4%) were venous, and

7 (9.6%) involved concurrent arterial and venous problems. When compared to all other patients, patients who experienced intraoperative microvascular compromise experienced similar total (recipient plus donor site) complications (48.5% versus 36.3%, respectively; p=0.06), but were at slightly higher risk for requiring subsequent postoperative reexploration (5.2% versus 7.4%, respectively; p=0.03). When compared to all patients excluding those who underwent postoperative reexploration, patients who experienced intraoperative microvascular compromise experienced greater total complications (33.2% versus 48.5%, respectively; p=0.03). When compared to patients who experienced postoperative microvascular compromise, patients who experienced intraoperative microvascular compromise exhibited a lower free flap loss rate (22.2% versus 12.3%, respectively; p=0.26), although this was not statistically significant, and had a lower total complication rate (76.9% versus 48.5%, respectively; p=0.03), including at the recipient site (65.4% versus 20.5%, respectively; p=0.0001). Smoking status, radiation history, and BMI were similar between all comparison groups. Risk factors for total flap loss in patients who suffered intraoperative microvascular compromise were the need to perform >1 arterial anastomotic revision (p=0.028), longer duration of reperfusion between ischemia times (p=0.005), and longer total ischemia time (p=0.0044).

Conclusions:

Patients undergoing microsurgical breast reconstruction who experience intraoperative microvascular compromise are more likely to require postoperative reexploration. However, their flap salvage rate is similar to patients who experience only postoperative microvascular compromise. When >1 arterial anastomotic revision is necessary, total ischemia time exceeds 175 minutes, or duration of reperfusion between ischemia times exceeds 80 minutes, the likelihood of total flap loss becomes significantly higher. These findings may be of utility with regard to intraoperative decision-making and patient counseling.

8:24 AM - 8:30 AM
Discussion

8:30 AM - 8:34AM
Four-Flap Breast Reconstruction: Bilateral Stacked DIEP and PAP Flaps
Louisiana State University Health Sciences Center, New Orleans, LA, USA
James L. Mayo, MD; LSU Health Sciences Center; Robert J. Allen, MD; New York University Langone Medical Center; Ali Sadeghi, MD; Louisiana State University Health Science Center
Introduction:

The deep inferior epigastric artery perforator free flap is a superior option in autologous breast reconstruction. However, in some patients, this flap alone may not offer sufficient volume for body specific breast reconstruction. Stacking DIEP flaps is a viable option for unilateral reconstruction. However, in the setting of bilateral breast reconstruction, stacking a DIEP flap with a PAP flap will provide the added volume and contour while maintaining a purely autologous reconstruction. This flap combination provides superior aesthetics while allowing an operative efficiency for an effective four-flap operation. We present the indications, technique and outcomes of our experience with stacked breast reconstruction utilizing DIEP/PAP flaps.

Methods:

The authors performed four-flap breast reconstruction in a total of 18 patients who required bilateral reconstruction without adequate volume by any single flap option. Two microsurgeons work simultaneously to harvest the four flaps and expose the internal mammary vessels. The patient remains in the supine position throughout the case. The recipient vessels for the flaps are predominantly the antegrade and retrograde internal mammary vessels bilaterally, a key component in providing operative efficiency. The DIEP flap is inset superiorly and the PAP inferiorly mirroring a natural breast shape. Complications reviewed include fat necrosis, dehiscence, hematoma, seroma and mastectomy flap necrosis. The average weights of flaps and mastectomy tissue were also reported.

Results:

18 patients underwent four-flap DIEP/PAP breast reconstruction. 3 patients were staged utilizing the thoracodorsal vessels as recipients in the second surgery during which an additional flap (DIEP or PAP) was stacked to the first flap after inadequate volume was recognized. The remaining 15 patients underwent single-stage four-flap reconstruction. Surgical time averaged 7 hrs 20 min for all single stage cases. The primary recipient vessels were the antegrade and retrograde internal mammary vessels. No flap losses occurred. Complications included one hematoma, one incidence of arterial and venous thrombosis successfully treated with anastomotic revision, one incidence of thigh donor site dehiscence, and three episodes of minor mastectomy skin flap necrosis.

Conclusions:

Four-flap breast reconstruction is the ideal autologous reconstructive option for patients requiring bilateral reconstruction without adequate single flap volume. Stacked DIEP/PAP flaps as described are both safe and efficient. Furthermore, this combination provides superior aesthetics mirroring the natural geometry of a breast.   Bilateral stacked DIEP/PAP flaps represent our first choice for breast reconstruction in this patient population.

8:34 AM - 8:38AM
Discussion