Tuesday, January 14, 2014 - Outcomes Studies Scientific Paper Session - 10:45am - 12:00pm

10:45am - 10:49am
The Effects of Immunosuppressive Agents on Outcomes in Microvascular Free Tissue Transfer
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Institution where the work was prepared: University of California, San Francisco, San Francisco, CA, USA

Background

Reported 10-year patient survival post-liver transplantation is nearing 70%, with similar trends seen for kidney transplantation. Given their increasing life expectancy, these patients have an increased need for post-transplant reconstructive surgery. Thus, plastic surgeons must know the effects of immunosuppressive medications on outcomes in microvascular reconstruction.

Methods

A retrospective review was performed of all immunosuppressed solid-organ transplant patients who underwent subsequent free tissue transfer over an 8-year period. Patient demographics, type of solid organ transplant, immunosuppressive regimen, anticoagulation regimen, associated medical comorbidities and complication rate were recorded and analyzed.

Results

A total of 22 microvascular free tissue transfers were performed over an 8-year period, for head and neck, and lower extremity reconstruction. Of these, 15 (68%) patients underwent prior kidney transplant, 5 (23%) underwent prior liver transplant, and 2 (9%) underwent prior lung transplant. Prednisone (82% of patients), cyclosporine (36%), and tacrolimus (32%) were the most commonly used immunosuppressive medications. There was 1 total flap loss (5%), 3 intraoperative arterial thromboses (14%), and 2 postoperative venous thrombosis (9%). Multivariate analysis illustrated a statistically significant association between prednisone and delayed flap healing (p=.03) and partial flap loss (p=.04).

Sirolimus had a statistically significant association with delayed healing (p=.04) and intraoperative/ postoperative thrombosis (*p*=.03).

Conclusion

Microvascular free tissue transfer has long been a challenge when performed on immunosuppressed patients. Our series represents the largest reported cohort to date of free tissue transfer in this population. In this series, multivariate analysis showed only prednisone and sirolimus to correlate statistically with operative morbidity. We found no statistically significant effect of tacrolimus on outcome.

The association between sirolimus and flap thrombosis is likely due to induction of Tissue Factor (TF) in endothelial cells, in turn initiating the coagulation cascade. In our cohort, one intraoperative arterial thrombosis and 2 postoperative (prior to postoperative day 5) venous thromboses occurred in conjunction with sirolimus, all successfully salvaged. We now place these patients on prophylactic intravenous heparin drip prior to unclamping the vascular anastomoses, and continue this until postoperative day 5. We recognize that transplant patients receiving prednisone or sirolimus at the time of their elective free flap procedure will require additional care to lower the additional risk of delayed wound healing, partial flap loss, and anastomotic thrombosis.

10:49am - 10:53am

Implant Breast Reconstruction and Radiation: A Multicenter Analysis of Long-Term Health-Related Quality of Life and Satisfaction

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Institution where the work was prepared: Memorial Sloan-Kettering Cancer Center, New York, NY, USA

Background: Indications for radiotherapy in the treatment of breast cancer are expanding. Radiotherapy has been associated with high rates of capsular contracture and reconstructive failure in patients undergoing implant reconstruction. Long-term satisfaction and Health-related quality of life (HR-QOL), important outcomes following breast reconstruction, have not been previously measured using a condition-specific, validated patient-reported (PRO) instrument. The aim of this study is to evaluate the impact of radiotherapy on patient satisfaction and HR-QOL.

Methods: A multicenter cross-sectional survey of patients who underwent implant-based breast reconstruction in 1 of 3 centers in the U.S. and Canada with and without radiation was performed. Outcomes evaluated were satisfaction with breasts, satisfaction with outcome, psychosocial well-being, sexual well-being and physical well-being using the BREAST-Q® (Reconstruction Module). Univariable and multivariable analysis were performed to evaluate the impact of radiotherapy on satisfaction with breasts.

Results: Response rate was 71%, 633 completed questionnaires were analyzed. Mean follow up was 3.3 years for irradiated patients (n=219) and 3.7 years for non-irradiated (n=414). Adjusted by age, body mass index (BMI), laterality and implant type, patients with radiation had significant lower satisfaction with breasts (58.3 vs. 64.0, $p<0.01$), satisfaction with outcome (66.8 vs. 71.4, $p<0.01$), psychosocial well-being (66.7 vs. 70.9, $p<0.01$), sexual well-being (47.0 vs. 52.3, $p<0.01$), and physical well-being (71.8 vs. 75.1, $p<0.01$) than non-irradiated patients. Patients who received radiation following implant placement had a significant decrease in satisfaction with breasts ($p<0.01$), whereas patients with pre-mastectomy

radiation followed by implant reconstruction had no significant difference (p=NS).

The multivariable analysis confirmed the negative impact of radiotherapy on satisfaction with breasts (ß =-2.3, *p*=0.04) when adjusted by other patient/treatment factors. Higher BMI was also associated with lower levels of satisfaction. Bilateral reconstructions and silicone implants were positively associated with satisfaction with breasts.

Conclusions: Radiotherapy has a negative impact on HR-QOL and satisfaction with breasts in patients with implant reconstruction that can now be accurately quantified from the patient perspective. The information provided here can help patients in the decision-making process when deciding undergoing radiotherapy and/or to adjust expectations.

10:53am - 10:57am

Preoperative Anemia Increases the Risk of Adverse Outcomes in Patients Undergoing Free Tissue Transfer: an Analysis of 2135 Patients from the ACS-NSQIP Database

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Institution where the work was prepared: Johns Hopkins Hospital, Baltimore, MD, USA

Background: Perioperative anemia is associated with adverse outcomes in general surgery, vascular surgery, cardiac surgery, and breast surgery. Perioperative anemia increases the incidence of complications in patients undergoing extensive surgical procedures and procedures with major blood loss. Since free tissue transfers are among the most lengthy and complicated plastic surgery procedures, we hypothesized that patients undergoing free tissue transfer would be particularly susceptible to the effects of preoperative anemia. This study examines the effects of preoperative anemia on free flap outcomes.

Methods: Patients who underwent free tissue transfer from 2005 to 2011 were identified from the American College of Surgeons National Surgical Quality Improvement Program (NSQIP). De-identified data on patient demographics, perioperative risk factors, and incidence of complications were obtained. Pre-defined outcomes included overall morbidity, flap failure, surgical site infection, wound breakdown, and repeat operation. Logistic regression was used to assess the crude and adjusted effect of anemia (defined as a hematocrit concentration <36% in women or <39% in men) on postoperative 30-day morbidity.

Results: The study population included 2135 patients who underwent free flap reconstructions, among whom 653 (30.6%) had preoperative anemia. Of anemic patients 55.1% were women and 44.9% were men. Compared to patients with normal hematocrit levels, anemic patients had 2.16 times higher odds of experiencing overall morbidity within 30-days of their operation (OR = 2.26, $p < 0.005$). Patients with anemia were significantly more likely to have wound breakdown (OR 2.20, $p < 0.005$) and were more likely to return to the operating room (OR 1.54, $p < 0.005$). However, preoperative anemia was not associated with a significantly increased risk of flap loss or surgical site infections.

Conclusions: Preoperative anemia is associated with an increased incidence of overall morbidity and is specifically associated with wound healing difficulties and repeat operations. However, anemia may not predispose patients to flap loss. As many patients undergoing free flap reconstruction are chronically ill, screening for preoperative anemia should be strongly considered. Preoperative anemia is often easy to correct. Additional prospective studies should clarify whether treating preoperative anemia can improve outcomes in microsurgical procedures.

	OR	95% C.I.	p value
Overall Morbidity	**2.26**	1.87-2.73	p<0.005
Superficial SSI	0.84	0.53-1.34	p=0.468
Deep SSI	1.27	0.73-2.21	p=0.400
Wound Breakdown	**2.20**	1.36-3.57	P<0.005
Flap Failure	1.02	0.64-1.63	p=.941
Return to OR	**1.54**	1.21-1.97	p<0.005

Table 1. Univariate logistic model for 30-day postoperative overall morbidity, surgical- site morbidity, flap failure, and return to OR in anemic patients.

10:57am - 11:01am

Decision Regret Following Breast Reconstruction: The Role of Self-Efficacy and Satisfaction with Information in the Preoperative Period

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Institution where the work was prepared: Division of Plastic Surgery, University Health Network, Toronto, ON, Canada

Background:

The vital relationship between satisfaction with information and decision regret has not been previously studied in breast reconstruction patients. An earlier study has shown that breast reconstruction patients undergoing abdominal microsurgical procedures experienced unpleasant outcomes, possibly due to inaccurate expectations prior to surgery. The objective of our study, therefore, was to assess this relationship as well as the factors that may influence satisfaction with preoperative information including self-efficacy (confidence with seeking medical knowledge) and the type of reconstruction (autologous tissue vs. implant based).

Patients and Methods:

All patients who underwent breast reconstruction between January 2009 and March 2011 were approached to complete the Modified Stanford Self-Efficacy Scale (1 to 10), Satisfaction with Information Subscale of the BREAST-Q (1-100) and the Decision Regret Scale (1 to 100). Two multinomial logistic regression models were built to assess the relationship between patient-reported satisfaction with information and decision regret, and to evaluate the relationship between satisfaction with information, self-efficacy level and socio-demographic characteristics.

Results:

In 100 participants (71% response rate), the mean Decision Regret score was 9.3/100 (SD=17.3) and the majority of patients experienced no regret (60%). The timing of reconstruction (immediate vs. delayed) and the method of reconstruction (autologous vs. implant based) were not significantly associated with decision regret. We found that regret was significantly reduced when patients were more satisfied with the preoperative information that they received from their plastic surgeons (β

coefficient = 0.95, 95% CI 0.93-0.96). Furthermore, patients reported higher satisfaction with information when they possessed more self-efficacy irrespective of their socio-demographic characteristics (β coefficient = 1.06, 95% CI 1.04-1.09).

Conclusion:

Patients who possess lower levels of self-efficacy are at greater risk for experiencing dissatisfaction with the information that they receive in the preoperative period, and ultimately suffered more regret over their decision to undergo breast reconstruction.

11:10am - 11:14am

Health Related Quality of Life in Women With a History of Breast Reconstruction- A National Perspective

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Background: According to the Nationwide Inpatient Sample database breast reconstruction (BR) rates have increased to 38%; implant reconstruction contributes most to this increase. With higher rates of BR and more breast cancer survivors there is strong impetus for survivorship research that focuses on the effectiveness of current treatment modalities on long term health and quality of life (HRQOL).

Methods: The Army of Women (AOW) comprises over 360,000 women who voluntarily participate in breast cancer research. After approval by the IRB and the AOW Scientific Advisory Committee, women with a history of breast cancer surgery were recruited to take electronically-administered condition specific surveys including the BREAST-Q©, PTSD checklist, Impact of Cancer scale, and a demographic survey. Regression analysis was used to evaluate factors associated with the three BREAST-Q© subscales; physical well being of the chest and upper body, psychosocial and sexual well-beingin women with a history of BR.

Results: 9,289 women with a history of breast cancer surgery responded to the "call-to-action"e-mail and 7,619 completed all questionnaires (83%). 2812 (37%) underwent BR with a mean age of 55 (SD= 9.4) and the mean time since surgery was 6.3 years (SD = 6.0). The breakdown of procedure type and timing is displayed in the table. Regression analysis revealed that women undergoing abdominal flaps had better HRQOL by all three subscales, when compared to implant reconstruction (all $P<0.0001$). Women with latissimus reconstructions scored significantly higher in psychosocial and sexual well-being ($p= 0.02$) while women with other autologous reconstructions scored significantly higher in chest and upper body physical well-being ($p=0.01$) compared to women with implant reconstruction. History of radiation, minor complications, increasing body mass index (BMI), and being unemployed significantly diminished HRQOL; whereas increasing

time since surgery and being a black woman were associated with better HRQOL.

Conclusion: This is the first national snapshot of women undergoing breast cancer surgery exploring HRQOL as it relates to type of reconstruction surgery. The population is skewed, as reflecting participants in the AOW, but data are still compelling. All types of autologous tissue reconstruction positively impacted HRQOL.

Table: Procedure Type and Timing		Percent	n
Timing			
	Delayed Reconstruction	29.91%	841
	Immediate Reconstruction	70.09%	1971
Reconstruction Type			
	Implants	49.79%	1400
	Latissimus	6.22%	175
	Abdominal Flaps (pedicle, free, or perforator)	23.12%	650
	Other Autologous (SGAP, IGAP, TUG)	0.32%	9
	Multiple Reconstructions/Complex	17.21%	484
	Other	0.28%	8
	I don't know	2.95%	83
	Missing Reconstruction Type	0.11%	3

11:14am - 11:18am

Analysis of risk factors, morbidity, and cost associated with respiratory complications following abdominal wall reconstruction (AWR)

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Background: Ventral hernias are a common, challenging, and expensive problem for both the general and reconstructive surgeon. Postoperative pulmonary complications have been reported in 1 in 5 patients and can translate into significant morbidity and mortality. There is a need for further outcome analyses delineating identifiable risk factors for postoperative respiratory morbidity (PRM) following abdominal wall repair (AWR), and the impact of PRM on resource utilization. The aim of this study was to assess perioperative factors and cost utilization associated with PRM morbidity in AWR.

Methods: All patients who underwent AWR by the senior author between 2007 and 2012 at the Hospital of the University of Pennsylvania were identified. Each patient record was reviewed for patient characteristics, comorbidities, operative details, and outcomes. Analysis of perioperative factors associated with PRM was performed using hospital defined ICD-9 codes. Bivariate and multivariate logistic regression analyses were used to assess independent predictors of PRM and linear regression was used to determine the financial impact.

Results: 134 consecutive AWR patients performed by senior surgeon (SJK) were included. Respiratory complications occurred in 15.7% (N=21) of patients; 5.2% required reintubation, 5.2% failed to wean, and 5.2% developed pneumonia. Regression analysis demonstrated intraoperative blood transfusions (P=0.008), highest peak intraoperative airway pressure (P=0.017), fascial closure (P=0.013), and ASA (P=0.019) were all associated with PRM. Linear regression analysis demonstrated that respiratory complications added cost of $60,933 per patient (P<0.001). Post-hoc analysis demonstrated that patients undergoing bridge repair had higher changes in overall peak airway pressures (5.7 ± 5.2 vs. 2.9 ± 6.9 cm H(2)O, P=0.027). This change in peak pressure represented a 30% increase for the mesh bridge group and only a 16% increase for the primary fascia group. Further post-hoc analysis of PRM demonstrated that patients experiencing complications stayed on average 16.2 days longer (10.4 ± 10.8

vs. 26.6 ± 17.7, P<0.0001) and represented the only 3 patients in the study experiencing mortality (0% vs. 14.3%, P=0.003).

Conclusion: We present an assessment of PRM in AWR which demonstrates that preoperative surgical risk (ASA), intraoperative intra-abdominal pressures (highest peak pressure), blood transfusions, and fascial closure are factors linked to morbidity. PRM is associated with significant mortality and a tremendous cost burden underscoring the importance of preoperative risk stratification and patient selection to optimize outcome and contain cost.

11:18am - 11:22am

Chimeric Vastus Lateralis-Anterolateral Thigh Free Flap in Head and Neck and Lower Extremity Reconstruction

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Institution where the work was prepared: Inova Fairfax Hospital, Falls Church, VA, USA

Background

Since first described, the vastus lateralis (VL) or anterolateral thigh (ALT) free flap has been used to reconstruct a plethora of defects. Further refinement of these flaps into a chimeric flap has expanded its utility for the reconstruction of complex defects. Its design lends itself particularly well to the reconstruction of head and neck defects due to the surgeon's ability to separate components for reconstruction of soft tissue deformities, boney defects, and replacement of anterior neck skin. On the lower extremity, the VL-ALT chimeric free flap allows for tailoring the reconstruction to the separate compartment coverage requirements often found after traumatic injuries. While these often long and technically difficult procedures are frequently performed at major academic institutions, it is also possible to perform them at community hospitals.

Methods

From April 2008 until May 2013 we have performed 36 VL or ALT free tissue transfers at a community based, academically affiliated institution. 6/36 of these have been true chimeric VL-ALT free flaps. Three were performed for reconstruction of head and neck defects after tumor resection with the remaining three performed for reconstruction of lower extremity defects acquired as a result of traumatic injuries. The average age of our patients was 59 years of age. Follow up is 2-18 months.

Results

During the study period a total of six VL-ALT free tissue transfers were performed. All patients were male with a history of tobacco use. The size of the defects that were reconstructed varied from ten by ten centimeters to twenty by thirty centimeters. Of the six free tissue transfers, we experienced a flap loss of 16% (one lower extremity limb salvage flap with large defect requiring vein grafts). Additionally, one patient required multiple returns to

the operating theater for management of partial flap necrosis and skin grafting.

Conclusions

The VL-ALT chimeric free flap is well suited to the reconstruction of a variety of complex wounds. The ability to use separately the different tissue types lends itself very well to reconstruction of the three dimensional defects often encountered after head and neck tumor resection and traumatic lower extremity injuries. This flap has a low morbidity, acceptable harvest time, and a fairly cosmetic scar while avoiding a second harvest site. We have successfully used this approach for five years and have demonstrated that it is possible to use advanced microsurgical techniques for complex wound reconstruction at our community hospital.

11:22am - 11:26am

Emerging Paradigms in Perioperative Management for Microsurgical Free Tissue Transfer: Review of Literature and Survey of Current Practices

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Institution where the work was prepared: Albany Medical College, Albany, NY, USA

Background

Over the past few decades, microsurgical free tissue transfer has become an increasingly valuable technique in reconstructive surgery. Despite this, there is a lack of reliable, evidence-based recommendations to guide perioperative patient management. The authors performed a systematic review to define strategies to optimize perioperative management. A survey of the members of the American Society for Reconstructive Microsurgery (ASRM) was then administered to identify current practices.

Methods

A systematic review of the literature was performed using key search terms including "free tissue transfer," "free flap," "anesthesia," "patient temperature," "fluid management," "vasodilators," "vasopressors," "anticoagulation," and "analgesia." Pertinent articles were selected and reviewed to define strategies to optimize perioperative management. An anonymous online survey consisting of 40 questions regarding perioperative management for microsurgical free tissue transfer was distributed to members of the ASRM. The questions covered topics including anesthesia, patient temperature, fluid management, vasoactive agents, and analgesia.

Results

A total of 171 articles were reviewed and key strategies to guide patient management were identified and classified according to level of evidence (LOE). Based on this data, the authors were able to devise recommendations to optimize patient outcomes.

Eighty-two microsurgeons participated in the survey (12% response rate). Twenty-nine respondents (36%) believed that complications of these cases are "sometimes" or "often" related to anesthesia variables. As many as 55% of respondents stated that they do not utilize specific goals and protocols to guide fluid management for these cases. Approximately 38% of respondents

stated that they have no target range for hemoglobin and hematocrit for these procedures. Only 22% of respondents monitor flap temperature in the immediate post-operative period. As many as 70% of respondents stated that they do not permit the use of a vasopressor in non-emergent situations.

Discussion

Current practices remain exceedingly diverse. Patient temperature, fluid management, hemoglobin concentration, and the use of vasopressors remain key areas where practices may be standardized and optimized. Strategies to improve patient outcomes can be defined from the available literature. Maintaining normothermia in the perioperative period is imperative (LOE 2b). Volume replacement should be maintained between 3.5-6.0 mL/kg/hr (LOE 2b). Hemoglobin should be maintained >10 g/dL (LOE 2b). Vasopressors have not been shown to harm outcomes in patients and may in fact improve flap blood flow (LOE 1b). Further studies are required to investigate strategies to improve outcomes.

11:35am - 11:39am

Predictive Risk Factors of Free Flap Thrombosis in Breast Reconstruction Surgery

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Institution where the work was prepared: The Aesthetic & of Plastic Surgery Institute, UCI, Orange, CA, USA

Introduction: Vascular thrombosis is one the major postoperative complications of free flap microvascular breast reconstruction operations which is associated with higher morbidity and potentially flap loss.

Purpose: To evaluate: 1) the rate of free flap thrombosis in breast reconstruction surgeries; 2) the effect of patient characteristics, comorbidities, free flap reconstruction-type, reconstruction-timing, radiation, and chemotherapy on flap thrombosis in free flap breast reconstruction.

Methods and Materials: Using the Nationwide Inpatient Sample (NIS) database, we examined the clinical data of patients who underwent immediate or delayed free flap breast reconstruction surgery from 2009 to 2010 in the United States. Patients who underwent pedicled flap breast reconstruction surgery were excluded from this study. Multivariate and Univariate regression analyses were performed to identify independent risk factors of flap thrombosis in this patient population.

Results: A total of 15,211 patients underwent free flap breast reconstruction surgery (immediate reconstruction: 42.75% vs. Delayed reconstruction: 57.25%) during this period in the US. The mean age was 50 years and the majority of patients were Caucasian (71%). The most common type of free flap reconstruction was free deep inferior epigastric artery perforator (DIEP) flap (53.6%) followed by free transverse rectus abdominis myocutaneous (TRAM) flap (43.1%), free superficial inferior epigastric artery (SIEA) flap (2%) and free gluteal artery perforator (GAP) flap (1.3%). The overall rate of flap thrombosis was 2.44 % (371 patients). The highest and lowest rates of free flap thrombosis were observed in the SIEA group (11.42%) and free TRAM flap group (1.74%) respectively. Multivariate regression analyses showed that peripheral vascular disease (adjusted odds ratio [AOR], 10.61), SIEA flap (AOR, 4.76) and delayed reconstruction (AOR, 1.42) were significant risk factors of flap thrombosis. There was no association between age, race, diabetes, hypertension, liver

disease, congestive heart failure, chronic kidney disease, smoking, radiation or chemotherapy on flap thrombosis.

Conclusions: The rate of flap thrombosis in free flap breast reconstruction is relatively low (2.44%). Peripheral vascular disease and free superficial inferior epigastric artery (SIEA) flap are the major independent risk factors of free flap thrombosis in autologous breast reconstruction surgery. Plastic surgeons should be aware that patients undergoing free SIEA flap are at higher risk of flap thrombosis and they should closely monitor flaps for thrombosis to salvage early where possible.

11:39am - 11:43am

Are Flaps Really Better Than Implants For Breast Reconstruction In Obese Females? – An Analysis Of 89,514 Women Undergoing Breast Surgery From The ACS-NSQIP Database

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Institution where the work was prepared: Johns Hopkins University, Baltimore, MD, USA

PURPOSE: To determine data-driven recommendations for breast reconstruction in obese women.

BACKGROUND: Obesity is a known risk factor for postoperative morbidity after mastectomy with/without reconstruction. Current evidence support the use of flaps over implants for reconstruction in this population. We searched for the reconstruction strategy associated with the lowest 30-day postoperative overall-morbidity, surgical-site morbidity, and reconstruction-failure rates in the obese population.

METHODS: We analyzed all females undergoing mastectomy with/without reconstruction from 2005-2011 in the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) databases.Data included demographic, preoperative, and perioperative factors. Patients were stratified by body mass index (BMI), all the overweight (BMI≥25, WHO definition) and obese females (BMI≥30, WHO definition) were identified, and multivariable regression was used to compare 30-day postoperative overall-morbidity, surgical-site morbidity, and reconstruction failure rates between breast-reconstruction procedures. Predefined outcomes included: cardiac, respiratory, neurological, urinary, venous thromboembolism, wound, and prosthesis/flap failure complications. Confidence intervals estimate 95% precision.

RESULTS: 89,514 women underwent mastectomy or breast reconstruction and had NSQIP BMI data, including: 65,827 (73.5%) mastectomy-only, 19,124 (21.4%) immediate breast reconstruction (IBR), and 4563 (5.1%) delayed breast reconstruction (DBR) patients. Overweight was independently

associated with higher postoperative overall-morbidity in the mastectomy-only ($OR_{\_adjusted}$=1.12; 95%CI:1.04–1.22, p=0.004) and IBR groups ($OR_{\_adjusted}$=1.34; 95%CI:1.16–1.55, p<0.001), while trending towards significance in the DBR group ($OR_{\_adjusted}$=1.41; 95%CI:0.95–2.11, p=0.08). Obesity was independently associated with higher overall-morbidity in all groups ($OR_{\_adjusted}$=1.91; 95%CI:1.24–2.94, p<0.03). Additionally, multivariable comparison of 30-day postoperative morbidity rates of flaps vs. implants (using tissue expanders as the reference group) in the 6,427 obese patients undergoing reconstruction, showed that flap reconstructions were associated with higher overall-morbidity ($OR_{\_adjusted}$=1.49; 95%CI:1.31–1.71, p<0.001), higher surgical-site morbidity ($OR_{\_adjusted}$=1.41; 95%CI:1.16–1.72, p=0.001), and higher reconstruction failure rates ($OR_{\_adjusted}$=2.74; 95%CI:2.01–3.75, p<0.001) than implant based reconstructions (Table 1).

CONCLUSION: Our study supports that obesity is associated with higher postoperative morbidity, but more importantly, it brings attention to the overweight population and to a dose response effect of BMI on postoperative morbidity. During the first 30 postoperative days, flap based reconstructions are associated with higher overall-morbidity, surgical-site morbidity, and reconstruction-failure rates compared to implant based reconstructions. The health care cost implications of the higher 30-day postoperative morbidity associated with flap based reconstruction warrant further investigation.

Table 1. Logistic Models for 30-day Postoperative Overall-Morbidity, Sur
Reconstruction Failure rates after breast reconstruction in obese women

Overall Morbidity	**Odds of overall morbidity event amor**			
	Univariable Regression (Unadjusted Odds Ratios)			
	OR	95% C.I.		OR
Reconstruction Procedure				
Tissue Expanders	*Referent*	-		*Refer*
Implants	0.91	0.80-	1.02	1.0
Autologous Flaps	**2.09*** **	1.91-	2.30	**1.49***
Surgical-Site Morbidity	**Odds of a surgical site morbidity event a**			
	Univariable Regression (Unadjusted Odds Ratios)			
	OR	95% C.I.		OR
Reconstruction Procedure				
Tissue Expanders	*Referent*	-		*Refer*
Implants	0.98	0.81-	1.18	1.0
Autologous Flaps	**1.59*** **	1.37-	1.85	**1.41***
Reconstruction Failure	**Odds of a reconstruction failure event a**			
	Univariable Regression (Unadjusted Odds Ratios)			
	OR	95% C.I.		OR
Reconstruction Procedure				
Tissue Expanders	*Referent*	-		*Refer*
Implants	1.22	0.84-	1.78	1.3
Autologous Flaps	**3.54*** **	2.72-	4.60	**2.74***

*p<0.05, **p<0.001, ***p<0.0001

Multivariable analysis after adjusting extensively for the following variables: 1) Age (continuous), 2) Preop Smoking status (dichotomous), 4) Perioperative Transfusions (dichotomous), 5) Work relative value uni (categorical), 7) Inpatient Status (dichotomous), 8) Type of Anesthetic method (categorical), 9) Amc classification (categorical, 10) Previous wound infection (dichotomous), 11) Previous cardiovascular mo respiratory morbidity (categorical), 13) Previous renal morbidity (categorical), 14) Previous hematology-on Diabetic status (dichotomous), 16) Alcohol consumption > 2 drinks/day in 2 weeks before admission (dichot condition (dichotomous) 18) History of previous operation within 30 days of the surgery (dichotomous).

11:43am - 11:47am

Neoadjuvant Radiotherapy is not Associated with Higher Postoperative Morbidity in 77,902 Patients Undergoing Mastectomy with or without Reconstruction

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Institution where the work was prepared: Johns Hopkins University School of Medicine, Baltimore, MD, USA

PURPOSE**:** To assess the impact of neoadjuvant radiotherapy (NRT) on 30 days post-operative morbidity in breast cancer patients undergoing mastectomy with or without immediate breast reconstruction.

BACKGROUND**:** Radiotherapy has been shown to reduce local recurrence of breast cancer and increase long-term survival. NRT constitutes a pre-surgical therapeutic approach to cancer patients. Evidence suggests that NRT can reduce the tumor bulk preoperatively, which could result in improved oncological outcomes after mastectomy. However, there is a lack of data assessing the impact of NRT on postoperative medical and surgical morbidity rates. As a result, we aimed to assess the impact of NRT on post-operative morbidity of patients undergoing mastectomy with and without immediate breast reconstruction.

METHODS**:** We analyzed all females undergoing mastectomy with and without immediate breast reconstruction from 2005-2011 in the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) databases (a prospective, risk adjusted, outcomes-based registry).[5] Data included demographic, preoperative, and perioperative factors. Pre-defined outcomes included overall morbidity and surgical site morbidity. Separate analyses were conducted for patients undergoing mastectomy only and mastectomy combined with immediate breast reconstruction. Logistic regression was used to assess the crude and adjusted effect of NRT on postoperative 30-day overall morbidity and surgical site morbidity. NRT was defined as any radiotherapy preceding a mastectomy by 90 days or less.

RESULTS**:** The mastectomy only population included 66,593 patients: 266 (0.4%) received NRT; 60,773 (91.3%) did not receive NRT and 5,554 (8.3%) patients were excluded due to missing NRT status. The immediate breast reconstruction population included 19,258 patients: 75 (0.39%) received NRT; 16,788 (87.2%) did not receive NRT and 2,395 (12.4%) were excluded due to missing NRT status. In the mastectomy-only population, no significant differences in the odds of overall morbidity ($OR_{Adjusted}$: 0.75; 95%CI: 0.41 – 1.36; P = 0.34) or surgical site morbidity ($OR_{Adjusted}$: 1.61; 95%CI: 0.75 – 3.47; P = 0.22) were observed between NRT and no NRT. Similarly, in the immediate breast reconstruction population, no significant differences in the odds of overall morbidity ($OR_{Adjusted}$: 0.21; 95%CI: 0.04 – 1.06; P = 0.059) or surgical site morbidity ($OR_{Adjusted}$: 0.81; 95%CI: 0.16 – 4.00; P = 0.79) were observed between NRT and no NRT (Table 1).

CONCLUSIONS**:** This study suggests that NRT does not increase the risk of adverse outcomes in breast cancer patients undergoing mastectomy with or without immediate reconstruction. These results provide a strong basis for future survival and prospective studies.

Table 1. Results of Logistic Regression Analysis

Odds of Overall Morbidity	Univariable		Multivariable	
	Mastectomy (n = 66,593) OR (95% CI)	**IBR (n = 19,258) OR (95% CI)**	**Mastectomy (n = 66,593) OR (95% CI)**	**IB (n = 1 OR (95**
Neo-adjuvant Radiotherapy				
No	Reference			
Yes	0.82(0.54 – 1.24)	1.45 (0.78 – 2.7)	0.75 (0.41 – 1.36)	0.21 (0.0
Odds of Surgical Site Morbidity	**Univariable**		**Multivariable**	
	Mastectomy (n = 66,593) OR (95% CI)	**IBR (n = 19,258) OR (95% CI)**	**Mastectomy (n = 66,593) OR (95% CI)**	**IB (n = 1 OR (95**
Neo-adjuvant Radiotherapy				
No	Reference			
Yes	1.75 (0.98 – 3.13)	0.94 (0.30 – 2.99)	1.61 (0.75 – 3.47)	0.81 (0.1

* P < 0.05; ** P < 0.01; *** P < 0.001

Multivariable Logistic Regression analysis was performed adjusting for 1) Chemotherapy (dichotomous), 2) Body (categorical), 3) Anemia (dichotomous), 4) Smoking (dichotomous), 5) Red Blood Cell (continuous), 6) Work Rel Unit (dichotomous), 7) Operative Year (continuous), 8) Inpatient Status (dichotomous), 9) Anesthesia (dichoto American Society of Anesthesiology Classification (categorical), 11) Wound Classification (categorical), 12) Cardiovascular morbidity (dichotomous) 13) Composite Respiratory morbidity (dichotomous) 14) Composite Rena (dichotomous), 15) Composite Hemonc morbidity (dichotomous), 16) Age (continuous), 17) Diabetes (categorical), (dichotomous), 19) Wound Infection (dichotomous), 20) Steroid (dichotomous), 21) Prior operation withi (dichotomous). *Abbreviations*: IBR = immediate breast reconstruction; 95%CI = 95% Confidence Interval

11:47am - 11:51am

Preventing Fat Necrosis in DIEP Flap Breast Reconstruction; Laser-Assisted Indocyanine Green Flourescent Angiographic Evaluation of the Fat

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Background: DIEP flaps have become the preferred flap for autologous breast reconstruction for a large portion of microsurgeons. Flap harvesting techniques and experience have significantly improved results. Morbidity remains low and is significantly improved over TRAM flap breast reconstruction. However, fat necrosis remains relatively common with reported ranges of 5-55% with varying reports on severity and symptomatology. Reported symptoms include nodules, pain, skin retraction, and draining wounds. Patients with fat necrosis frequently require additional surgery to exclude cancer, improve symptoms and cosmesis. Prevention with adequate perforator selection and flap design utilizing CTA/MRA has the potential to reduce the incidence of fat necrosis. Additional technology to assess dermal perfusion utilizing laser-assisted indocyanine green dye fluorescent angiography can reduce complications associated with mastectomy skin flap loss. In the course of utilizing this technology the authors began investigating fat perfusion in an attempt to reduce fat necrosis.

Methods: The authors conducted a retrospective review of all DIEP breast reconstructions over a two year period in which intraoperative laser-assisted indocyanine green dye fluorescent angiography was used to guide operative decision-making for both dermal and fat perfusion. All studies were reviewed for areas predicting necrosis and were compared to the occurrence of fat necrosis detected on clinical exam or documented by biopsy at time of revision. Studies were analyzed to establish appropriate timing of assessment and absolute and relative values for perfusion quantification and prediction of poorly perfused fat that would undergo eventual necrosis.

Results: Included in review were 146 DIEP flaps (61 bilateral and 24 unilateral) for microsurgical breast reconstruction. Fat necrosis rates were 4% on clinical exam, and 2% on pathologic exam. Laser-assisted indocyanine green dye fluorescent angiography studies showed areas of potential fat necrosis, the majority of which had been removed at the original surgery. Characteristics of fat removed included a relative perfusion value less than 35% and an absolute value less than 15. Close review of patients with postoperative fat necrosis showed similar findings with

inadequate removal of tissue with a relative perfusion less than 30% and an absolute value less than 15.

Conclusions: Laser-assisted indocyanine green dye fluorescent angiography is a useful tool in predicting and preventing postoperative fat necrosis in DIEP flap breast reconstruction. It has the potential to reduce fat necrosis to levels on par with TRAM flap breast reconstruction without the morbidity of the TRAM site donor defect.