PURPOSE: This study aims to determine if the intraoperative use of laser-assisted indocyanine green (ICG) fluorescence angiography affects postoperative fat necrosis through a multivariable analysis of 409 DIEP free flaps for breast reconstruction.

METHODS: A retrospective review was performed on free flaps for breast reconstruction at a single center from 2010–2016. Inclusion criteria ensured that only single pedicle deep inferior epigastric artery perforator flaps with a single artery and venous anastomosis to the cranial internal mammary vessels for both unilateral or bilateral breast reconstruction were analyzed. ICG was used after the flap had been anastomosed on the chest to subjectively assess for areas of hypoperfusion if there was clinical concern. Less commonly, it was utilized to subjectively assess perforator quality on the abdomen if there was a discrepancy with clinical findings versus the preoperative CT angiography. A univariable logistical regression analysis was first conducted on the use of ICG angiography along with 27 other patient demographic and surgical factors including row of perforator, perforator diameter, perforator number, flap weight, and the year the surgery. From this, an odds ratio (OR) with 95% confidence intervals of the effect on DIEP flap fat necrosis was derived for each variable. All variables with a p< .15 for the calculated OR in univariable analysis were then entered in a backward selection algorithm to yield the parsimonious multivariable logistic regression model. This subsequent multivariable analysis was done to determine if ICG angiography had an independently significant effect on fat necrosis when other conceivable confounding factors, which were significant in the univariable analysis, were included.

RESULTS: 409 total DIEP flaps were included in both univariable and multivariable statistical analyses. The average age of the patients was 50.5 years old. The average BMI of the patients was 30.7. The average follow up for these patients was 18.5 months, with a median of 15.75 months. 14.4% of flaps had fat necrosis in total. Intraoperative ICG angiography was used for 130 flaps (31.8%) and was independently associated with a decrease in the odds of fat necrosis (OR .46, p-value= .04). ICG angiography directly guided excision of hypoperfused areas in 50 flaps (38.5%), ensured the presence of adequate perfusion in 78 flaps (60%), and identified a pedicle kink after anastomosis in 2 flaps (1.5%) Prophylactic excisions of the flap without using ICG angiography were done in 107 flaps (26%) and did not affect fat necrosis rates (OR 1.74, p-value = .1). The average weight of the resected portion of flaps without ICG angiography was 250.8 grams, whereas the average weight of the resected portion of flaps with ICG angiography was 152.3 grams. This 98.5-gram per flap difference was statistically significant (p-value=.01).

CONCLUSION: Our results indicate that intraoperative laser-assisted ICG fluorescence angiography decreases the odds of fat necrosis in DIEP flap breast reconstruction by guiding a more accurate flap debulking at inset. This can save an average of 98.5 grams of tissue per flap when compared to excising areas of hypoperfusion by just clinical signs alone.

Transversus Abdominis Plane Blocks in Microsurgical Breast Reconstruction: An Analysis of Pain, Narcotic Consumption, Length of Stay and Cost Implications

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PURPOSE: Transversus abdominis plane (TAP) blocks are increasingly utilized in abdominally-based microvascular breast reconstruction. Studies, however, have not reliably shown improvements in postoperative pain,1–3 and cost implications remain unknown. The purpose of this study is to elucidate the global effects of TAP blocks on reconstructive and institutional outcomes after microvascular breast reconstruction.

METHODS: Patients undergoing abdominally-based microvascular breast reconstruction from 2015–2017 were reviewed. Length of stay, complications, narcotic consumption, donor-site pain and hospital expenses were compared between patients that did and those that did not receive TAP blocks with liposomal bupivacaine. Patient that did not receive TAP blocks had local infiltration of the rectus fascia and abdominal flaps with bupivacaine.

Medication consumption was summated for the first 72 hours of inpatient stay and donor-site pain was determined from nursing-reported pain scores. Hospital expenses were calculated...
from estimates of average hospital expenses per inpatient day, medication costs including liposomal bupivacaine, and operating room expenses. A sub-population analysis was performed for high-body mass index (BMI) patients (BMI ≥ 25).

RESULTS: Fifty patients (43.9%) received TAP blocks and 64 patients (56.1%) did not. 98.8% of patients with TAP blocks underwent deep inferior epigastric artery perforator (DIEP) flap reconstruction and 1.2% had muscle-sparing transverse rectus abdominis myocutaneous (ms-TRAM) flaps compared to the no-TAP group which had 94.2% DIEP, 3.9% ms-TRAM and 1.9% superficial inferior epigastric artery (SIEA) flaps (p=0.2414). Of the 50 TAP blocks, 27 (54.0%) were performed under ultrasound guidance. Patients in the no-TAP block group had a higher rate of major mastectomy flap necrosis (17.5% versus 7.4%, p=0.0493). The remainder of reconstructive and donor-site complications were comparable. There were no complications secondary to TAP blocks themselves.

Patients with TAP blocks had significantly decreased oral (46.5 versus 79.9 mg oxycodone equivalents, p=0.0001) and total (25.9 vs 44.4 mg morphine equivalents, p=0.0001) narcotic consumption as well as less donor-site pain (3.3 versus 4.3, p<0.0001). There was no significant difference in hospital expenses between the two cohorts ($21,531.53 versus $22,050.15 per patient, p=0.5659). High-BMI patients with TAP blocks additionally had a significantly shorter length of stay (3.8 versus 4.4 days, p=0.0094) compared to those without blocks.

Multivariable linear regression analysis revealed TAP blocks as the only independent predictor of decreased total narcotic usage (p<0.0001) and average abdominal pain (p<0.0001) post-operatively.

CONCLUSION: TAP blocks with liposomal bupivacaine reduce postoperative narcotic consumption as well as donor-site pain in all patients after abdominally-based microvascular breast reconstruction without increasing hospital expenses. TAP blocks additionally decrease length of stay in patients with BMI ≥ 25.

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The Impact of Mastectomy Weight on Reconstructive Trends and Outcomes in Nipple-Sparing Mastectomy: Progressively Greater Complications with Larger Breast Size

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PURPOSE: Reconstructive trends and outcomes for nipple-sparing mastectomy (NSM) continue to be defined. The graduated impact of breast size and mastectomy weight remain incompletely evaluated. We therefore examine patient-specific trends and outcomes in a large number of NSMs stratified by mastectomy weight to fully evaluate the impact of breast size on reconstructive complications and further aid in risk stratification of patients presenting for breast reconstruction after NSM.

METHODS: All patients undergoing NSM from 2006 to June 2016 were identified. Demographics and outcomes were analyzed and stratified by mastectomy weight ≥ 800 grams (large group), between 799 and 400 grams (intermediate group), and < 400 grams (small group).

Descriptive statistics and measures of central tendency were used to describe absolute and mean results, respectively. Student’s t-tests were used to analyze binary data sets while Chi-squared analysis was used to compare proportional responses. A binary logistic regression analysis was also performed. P-values of less than 0.05 were significant.

RESULTS: Of 809 NSMs, 66 (8.2%) had mastectomy weights ≥ 800 grams, 328 (40.5%) had mastectomy weights between 799 and 400 grams, and 415 NSMs (51.3%) had mastectomy weights < 400 grams.

NSMs in the large group were significantly more likely to experience major mastectomy flap necrosis (p=0.0005),