resection for breast cancer or carcinoma in situ, followed
by breast reconstruction, from 2010 to 2015. 524 patients
met inclusion criteria: 148 (28.2%) patients underwent AFG
(test group), while 376 (71.7%) patients did not undergo
AFG (control group). Patient demographics, cancer char-
acteristics, oncologic treatment, surgical treatment, surgi-
cal complications, local recurrence, and distant metastases
were analyzed.

RESULTS: Both patients who underwent AFG and those
who did not were of similar BMI, smoking status, and
BRCA status. Patients who underwent AFG were signifi-
cantly younger (47.6 years vs. 52.1 years, p<0.05), and
were less likely to have diabetes (2% vs. 7.2%, p<0.05) than
those who did not undergo AFG.

In per breast analysis, the two groups demonstrated simi-
lar surgical indication rates (therapeutic vs. prophylactic),
distribution of Stage 1, 2, and 3 cancer, and similar rates of
chemotherapy and radiation. DCIS was more common in
the AFG group (20.6% vs. 14.5%, p=0.013), while hormone
therapy was less common (52.4% vs. 67.5%, p=0.012).
Patients underwent 1 to 4 AFG procedures: 2 in 16.9%, 3 in
3.2%, and 4 in 0.4%.

Mean follow-up time from initial surgery was 42.1 months
in the AFG group and 34.5 months in the control group
(p<0.01). The overall complication rate following AFG was
9.4%; with a 1.7% infection rate, 1.3% fat necrosis rate,
6.0% oil cyst rate, and 0.4% wound healing problem rate.
There were no incidences of seroma or hematoma following
AFG. Additionally, the AFG and non-AFG groups demon-
strated no significant differences in overall reconstructive
complication rates (25.2% vs. 23.5%), or individual rates of
infection, wound healing complications, hematoma
or seroma formation, implant exposure, or flap failure.
Among breasts receiving surgery for therapeutic indica-
tions (AFG n=162, control n=414), there were similar rates
of local recurrence: AFG group 2.5%, control group 1.9%
(p=0.688). Interestingly, the mean time to recurrence was
significantly longer in the AFG group (52.3 vs. 22.8 months
from initial surgery, p=0.02).

CONCLUSION: AFG is a powerful tool in breast recon-
struction. This large single-institution study, which evalu-
ates patients of comparable BRCA status, cancer staging,
chemotherapy, and radiation therapy, provides valuable
evidence-based support for its oncologic safety.

Disclosure/Financial support: None of the
authors has a financial disclosure to report

An Anatomical and Histological
Intercostal Nerve Study to Determine
Optimal Recipient Site for Sensory
Reinnervation in Autologous Breast
Reconstruction

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PURPOSE: Some developments in the evolution of per-
forator flaps in autologous breast reconstruction include
attempts to reinnervate the harvested tissue. There is a
paucity of data on sensory reinnervation but it has been
reported that the use of innervated autologous flaps in breast
reconstruction can provide stability, protection from direct
trauma, recovery of erogenous sensation and higher patient
satisfaction.1,2,3 Previous studies have evaluated the anterior
abdominal wall intercostal nerve anatomy as a donor nerve
to be raised with autologous abdominal based flaps.4 This
study provides the anatomical basis to determine the opti-
um recipient site choice for sensory coaptation in micro-
surgical breast reconstruction.

METHODS: Twelve hemi-chests were dissected from six
fresh (non-frozen) cadaveric females, with a median age of
79 years (range 63–100) and BMI of 26.8. Dissections were
carried out from the anterior midline proceeding laterally to
identify subcutaneous portions of cutaneous branches of the
anterior cutaneous intercostal nerve and then exposure of the
first six ribs. Costal cartilage was sequentially removed to
expose the internal mammary vessels and the anterior cuta-
neous intercostal nerve (ACB) and the lateral (subcutaneous)
branch of the anterior cutaneous intercostal nerve (LACB).
Anatomical measurements were recorded and nerve samples
from both branches were reviewed histologically. Specimens
were cross-sectioned and stained with H&E and Karnovsky
and Roots Staining to differentiate sensory fascicles.4

RESULTS: A lateral subcutaneous branch of the anterior
cutaneous branch of the intercostal nerve (LACB) was noted
consistently in the 2nd to 4th rib space (96% cases), with a
median length of 43mm, 37.5mm and 37mm respectively.
These nerves perforated the intercostal muscles within 1cm
from the sternal edge, and the length and diameter of the
LACB diminished caudally, with the largest diameter nerves
at the 2nd–4th intercostal spaces. Histological analysis dem-
onstrated that the LACB nerves had consistently a greater
average total fascicular area than ACB nerves (18513um2
versus 5420um²). In addition, LACB nerves had a larger area per fascicle than the ACB nerves (6784um² versus 5420um²), demonstrating differences in individual fascicle size between LACB and ACB nerves.

CONCLUSIONS: A better understanding of characteristics of the anterior cutaneous intercostal nerve branches can optimize the site of recipient site coaptation. On preparation of the internal mammary vessels, preservation of the LACB can provide better size, with good sensory innervation for coaptation.

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Routine Sampling of Internal Mammary Lymph Nodes During Microsurgical Breast Reconstruction – Experience Based on 524 Microsurgical Breast Reconstructions

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PURPOSE: Exploration of the internal mammary vessels during microsurgical reconstruction presents an ideal opportunity for identifying and sampling the internal mammary lymph node (IMLN) basin.

METHODS: A retrospective review of patients undergoing microsurgical breast reconstruction using the internal mammary vessels as recipient vessels was conducted from March 2000 to December 2014. Patient demographics, tumor characteristics, preoperative lymph node mapping, reconstructive timing and outcomes were studied.

RESULTS: A total of 524 microsurgical breast reconstructions in 516 patients were performed using the internal mammary vessels. IMLNs were sampled in 53 immediate and 42 delayed breast reconstructions. Eight (seven in the immediate and one in the delayed group) of the sampled nodes were positive for cancer metastasis, for an incidence of 8.4% in identified lymph nodes. All patients with metastatic IMLNs subsequently received local-regional radiation and chemotherapy. All patients were alive, and 6 were disease-free at the conclusion of the study period, which had an average follow up of 67.3 months.

CONCLUSION: Visible IMLNs should be routinely sampled during recipient vessel preparation for microsurgical breast reconstruction. This series underscores the essential role of plastic surgeons in assisting with disease staging to provide adequate adjuvant treatment and improve the survival of breast cancer patients.

Comparison of Donor-Site Morbidity, Functional Outcome, and Pain Following Abdominal Autologous Breast Reconstruction

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PURPOSE: Abdominal flap reconstruction is the most popular form of autologous breast reconstruction given its superior long-term aesthetic outcomes. Options include pedicled TRAM (PTRAM), free TRAM (FTRAM), DIEP, and SIEA flaps. Prior studies comparing outcomes among these modalities have often produced contradictory results. The current study aims to compare abdominal donor-site morbidity, functional outcome, and patient satisfaction among these autologous flap reconstructions.

METHODS: Drawing from the practices of 11 centers and 57 surgeons, patients undergoing PTRAM, FTRAM, DIEP, SIEA, or mixed MS-FTRAM+DIEP flaps were prospectively evaluated for abdominal donor-site complications and patient-reported outcomes (PROs). The PROs were measured by BREAST-Q survey to assess breast satisfaction and well-being-abdomen, and PROMIS survey to assess physical function and pain, pre-operatively and at one and two years post-operatively. Mixed effect regression models were used.