RM1 **Lymphatic Microsurgical Preventive Healing Approach (LYMPHA) for the Primary Prevention of Lymphedema: A 3-Year Follow-up Matched Cohort Study**

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Background: Breast cancer patients who undergo axillary lymph node dissection (ALND) and radiation therapy (XRT) may develop lymphedema with reported rates up to 40%. Performing lymphatic-venous anastomosis at the time of ALND may prevent the development of lymphedema. Our institution has previously shown a transient lymphedema rate of 12.5% in those that underwent LYMPHA compared to 50% in unsuccessful attempts[1]. However, longer-term results are not well established. Here we examine long-term results of our patients.

Methods: Women requiring ALND for breast cancer were offered Lymphatic Microsurgical Healing Approach (LYMPHA). Afferent lymphatic vessels were identified by blue dye injection into the ipsilateral arm and microsurgical anastomosis was performed to a branch of the axillary vein. Early follow-up included lymphoscintigraphy, arm measurements, bioimpedance spectroscopy (L-Dex), whereas later follow-up (>2yr) was largely based on clinician assessment. Patients were compared to a matched group that did not undergo LYMPHA. Unpaired t-tests and Fisher's exact test were used to compare continuous and categorical data.

Results: From 2012-2016, 47 women completed the LYMPHA procedure at a single academic medical center and were compared to a group of 47 matched historical controls without LYMPHA. Demographics were similar between the two groups (mean age 53.8 vs 50.6y, p=0.21; BMI 27.6 vs 29.2, p=0.26). For the LYMPHA group, the average number of lymph vessels anastomosed was 2 per patient (range 1-4). Patients were followed up to 71 mo (mean 36) and 75 mo (mean 31.3). Of the 47 who underwent successful LYMPHA procedure, 12 (25.5%) patients had clinical evidence of lymphedema compared with 24% (11/47) who did not undergo LYMPHA. Rates of lymphedema were increased following XRT for both groups: 31% in the LYMPHA group versus 33% (p=n.s.).

Conclusion: We find that at a 3-year time-point there is no significant difference in the clinical rates of lymphedema following primary lympho-venous bypass in this high-risk cohort of patients. Further assessment of LYMPHA is warranted before recommending it as a routine treatment to help prevent lymphedema in patients undergoing ALND for breast cancer.

[1] Feldman S, Bansil H, Ascherman J, Grant R, Borden B, Henderson P, Ojo A, Taback B, Chen M, Ananthakrishnan P, Vaz A, Balci F, Divgi CR, Leung D, Rohde C. Single Institution Experience with Lymphatic Microsurgical Preventive Healing Approach (LYMPHA) for the Primary Prevention of Lymphedema. Ann Surg Oncol. 2015;22(10):3296-301.

RM2 **Sensory Recovery after 1 Year from a Multi-Center Propective Outcomes Registry**

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Background

Sensory restoration has been described as the next frontier in autologous breast reconstruction. Despite successful reports, flap neurotization has not yet become widely adopted, partly due to substantial heterogeneity in surgical technique and study design. The Sensation Neurotization Outcomes in Women (Sensation-NOW) study is a multi-center prospective outcomes registry to evaluate flap neurotization, return of sensation, and its impact on short and long-term patient-reported outcomes after autologous breast reconstruction in a standardized manner. We report on clinical findings at 1 year following neurotization.

Methods

This IRB-approved registry has been initiated at 15 centers to date. Patients who underwent autologous reconstruction with and without flap neurotization were enrolled. Neurotization was performed via coaptation of a sensory branch of T10-12 to T3-4 using a nerve allograft. Standardized sensory assessments using Semmes-Weinstein Monofilament (SWMF) or Pressure Specified Sensory Device were completed at 9 test zones at postoperative time intervals (i.e. Early (0-3M), Mid (5-7M), Annual (11-13M), Late (17-19M), Final (23-26M)). Clinically meaningful sensation was defined as pressure $<100(g/mm^2)$ or SWMF ≤ 6.65.

Results

A total of 167 subjects with outcomes (269 breasts) have been enrolled to date. Comparative analysis of 1-year sensory outcomes data for 37 patients (67 breasts) was performed. Flap neurotization was associated with a meaningful sensory recovery at $^{3}5$ test zones in 48% at a mean follow-up of 13.2 ±2.5 months (vs. 30% at 15.7 ±3.6 months; (Figure 1). Non-neurotized breasts approached a significantly higher rate of non-response as compared to neurotized breasts (29% vs 9%, p=0.06).

Additionally, neurotized breasts demonstrate an increased rate of sensory recovery within the test zones compared to non-neurotized breasts (Figure 2).

No related adverse events were reported.

Conclusion

Flap neurotization is safe and associated with higher early and long-term sensory recovery as noted in previous reports. Greater sensibility and wider distribution of sensation was observed in

the neurotized group. While prospective, a limitation of the study is its non-randomized design. Ongoing clinical studies are underway with longer term follow-up and to investigate the association of breast sensation with patient-reported outcomes.