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Lower Extremity Lymphedema with Leg Dermal Backflow Stage 2–3 Treated by the Superior-Edge-of-the-Knee Incision Method: Is a Single Lymphaticovenular Anastomosis Enough?

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BACKGROUND: Treating lymphedema is always challenging for microsurgeons. Application of the Superior-Edge-of-the-Knee Incision method for lymphaticovenular anastomosis is reported to have a strong therapeutic effect in patients treated for lower extremity lymphedema because lymph-to-venous flow at the anastomosis is enhanced by knee joint movement during normal walking.1 We investigated whether a single lymphaticovenular anastomosis is adequate for early lower extremity lymphedema.

METHODS: The study involved ten patients with lower extremity lymphedema characterized by stage 2–3 dermal backflow and treated by a single lymphaticovenular anastomosis at the thigh via the Superior-Edge-of-the-Knee Incision method.2 The lymphatic vessel and direction of flow were assessed intraoperatively, and reduction in lymphedema volume was assessed postoperatively.

RESULTS: Use of our incision method yielded five anastomoses in the five patients with stage 2 dermal backflow and five anastomoses in the five patients with stage 3 dermal backflow. Mean diameter of the lymphatic vessel was 0.65 ± 0.08mm (0.65 ± 0.09 and 0.65 ± 0.09mm in the stage 2 and stage 3 patients, respectively; p=1.000). No venous reflux occurred in any patient. Mean follow up was 7.70 ± 3.30 months (9.60 ± 3.29 months and 5.80 ± 2.17 months for the stage 2 and 3 patients, respectively; p=0.068). The circumference of the affected limb was reduced in all patients. Mean reduction in the lower extremity lymphedema index was 20.160 ± 9.892 (22.651 ± 12.272 and 17.668 ± 7.353 in the stage 2 and 3 patients, respectively; p=0.462).

CONCLUSIONS: A single lymphaticovenular anastomosis created by the Superior-Edge-of-the-Knee Incision method has a strong therapeutic effect in patients with stage 2–3 dermal back flow. Our treatment strategy using only a single lymphaticovenular anastomosis has the following advantages: only one microsurgeon with an operating microscope is needed; operation time is shortened by a single site lymphaticovenular anastomosis; largely lymphatic vessels of adequate size for anastomosis can be detected; imaging is not needed for detection of lymphatic vessels.

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Diagnostic Accuracy of Lymphoscintigraphy for Lymphedema

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INTRODUCTION: Lymphedema is the chronic enlargement of tissue due to inadequate lymphatic function. Diagnosis is made by history and physical examination and confirmed with lymphoscintigraphy. The purpose of this study was to (1) assess the accuracy of lymphoscintigraphy...
for the diagnosis of lymphedema and (2) determine characteristics of patients with false-negative tests.

METHODS: Patients referred to our lymphedema program with “lymphedema” between 2009–2016 were analyzed. Subjects were assessed by history, physical examination and lymphoscintigraphy. Patient age at presentation, duration of lymphedema, location of disease, gender, previous infections, and lymphedema type were recorded.

RESULTS: The study included 228 patients. Lymphedema was diagnosed clinically in 170 subjects and confirmed by lymphoscintigraphy in 162 (117 primary lymphedema, 45 secondary); 58 patients were thought to have a condition other than lymphedema and all had negative lymphoscintigrams (95% sensitivity, 100% specificity). A subgroup analysis of the 8 patients with clinical lymphedema but negative lymphoscintigrams was performed: all had primary lymphedema. Four patients were male, 7 involved the lower extremity, and 3 had prior infections. Mean duration of disease prior to lymphoscintigraphy was 8 years (range 1 month to 32 years). Lymphedema type, duration of disease, and infection history were not different between patients with true positive and false negative lymphoscintigrams (p=0.5). Two patients with a false-negative result underwent repeat lymphoscintigraphy 2.5–3 years later and exhibited a positive study consistent with lymphedema.

CONCLUSION: Lymphoscintigraphy is very sensitive and specific for lymphedema. There are no significant predictive factors for false negative studies although all these patients had primary lymphedema. A patient with a high clinical suspicion of lymphedema and a negative lymphoscintigram should be treated for the disease and undergo repeat lymphoscintigraphy over a year later.

DISCLOSURES: None

Bi-level Vascularized Lymph Node Transfer: More Effective Than Single Site?

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INTRODUCTION: Vascularized lymph node transfer (VLNT) has been established as a viable treatment option for upper extremity lymphedema after mastectomy. This procedure can be completed in conjunction with microsurgical breast reconstruction. Various donor sites have been described including the groin and the right gastroepiploic lymph nodes. The goal of this study was to evaluate and compare outcomes of patients undergoing single level or bi-level VLNT.

MATERIALS AND METHODS: A retrospective review was conducted of a single surgeon experience with VLNT from 2014 to 2015 for patients with upper extremity lymphedema following mastectomy. Demographics, medical comorbidities, concurrent procedures, donor and recipient sites, circumferential differentiation (circumference of the lesion limb minus the healthy limb, divided by that of the healthy limb) and circumferential reduction rate (preoperative difference between the circumferences of the lesion and healthy limbs minus the postoperative difference, divided by the preoperative difference) were calculated from measurements obtained at 1 and 3 months post-operatively. Statistical analyses were completed with SPSS 23 (IBM).

RESULTS: 14 patients underwent VLNT between 2014 and 2015. 4 patients underwent bi-level VLNT (recipient sites axilla and volar forearm (N =2) and axilla and wrist (N=2). Donor sites were right gastroepiploic lymph nodes (N=3) and deep inferior epigastric lymph nodes (N=1). There were no significant demographic or health differences between the single site and bi-level groups. There were no significant differences in post-op complications related to donor or recipient site, length of stay or revision rate. Circumferential differentiation was not significantly different between the bi-level and single level groups averaged across 3 measurement sites (above the elbow, below the elbow and at the wrist) at 1 month (13.4% vs. 5.7%, respectively, p=0.227), and 3 months (9.6% vs. 1.7%, respectively, p=0.112). Circumferential reduction rate was not significantly different between bi-level or single level groups at 1 month (20.0% vs. 34.3%, respectively, p=0.424) or 3 months (46.6% vs. 37.9%, respectively, p=0.718).

CONCLUSIONS: Bi-level VLNT is a viable surgical treatment for upper extremity lymphedema after mastectomy. In this series there were similar complication rates to single site transfer. Bi-level technique and single level technique were not statistically significantly different in terms of circumferential differentiation or reduction rate at short term follow up. Further study is needed to determine if bi-level is superior to single levelVLNT long term.

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