

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

Stephen Duquette MD, Romina Deldar BS, Mary Lester MD, Rajiv Sood MD, Juan Socas MD

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 reconstruction¹. Various donor sites have been described including the groin² and the right gastroepiploic lymph nodes³. 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 level VLNT long term.

1. Nguyen AT, Chang EI, Suami H, Chang DW. An Algorithmic Approach to Simultaneous Vascularized Lymph Node Transfer with Microvascular Breast Reconstruction. *Ann Surg Oncol*. 2015;2919-2924.
2. Lin C-H, Ali R, Chen S-C, et al. Vascularized groin lymph node transfer using the wrist as a recipient site for management of postmastectomy upper extremity lymphedema. *Plast Reconstr Surg*. 2009;123(4):1265-1275.
3. Ciudad P, Maruccia M, Socas J, et al. The laparoscopic right gastroepiploic lymph node flap transfer for upper and lower limb lymphedema: technique and outcomes. *Microsurgery*. 2015. doi: 10.1002/micr.22450