

Prevention Of Breast Cancer Related Lymphedema With Prophylactic Lymph Node Transfer: Preliminary Results Of A Prospective Study

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Background

Breast cancer patients undergoing multimodality treatment including an axillary node dissection (AND), chemotherapy, and radiotherapy are at extremely high risk for developing breast cancer related lymphedema (BCRL) which is a debilitating condition that significantly compromises patients’ quality of life. While there are studies to evaluate the effect of lymphovenous bypass (LVB) at the time of the AND, there is a limited studies on the use of a prophylactic vascularized lymph node transfer (VLNT). In this study, we present our early experience of performing a prophylactic VLNT at the time of deep inferior epigastric perforator (DIEP) flap breast reconstruction.

Methods

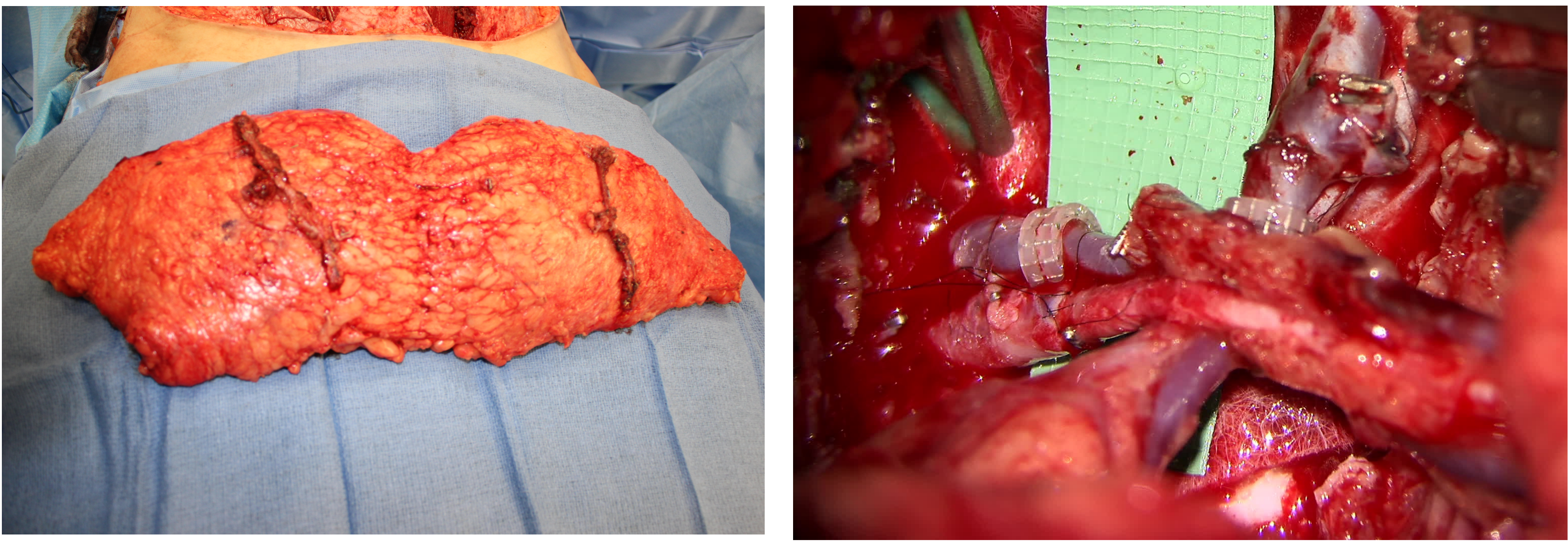
We performed a prospective study on all consecutive patients undergoing DIEP flap breast reconstruction with a prophylactic VLNT from January 2016 to December 2020. All patients had to have undergone an AND, chemotherapy, and radiotherapy for breast cancer. All patients were evaluated every 3 months and followed for a minimum of one year. Any patient with less than 12 months follow-up was excluded from analysis. All patients underwent preoperative volumetric measurements of both upper extremities using a perometer. Patients were followed prospectively, recording operative details, patient demographics, comorbidities, adjuvant therapies, and objective metrics were recorded. Post-operative outcomes and follow-up data were also recorded.

Pre/post-operative Photos



•Preoperative and postoperative photographs of patient who underwent a modified radical mastectomy and adjuvant radiation. She underwent a bipediced DIEP with a VLNT in 2020, and is doing without well without any evidence of lymphedema

Intraoperative Photos



•An intraoperative photograph demonstrating a bipediced DIEP with the superficial inguinal nodes as VLNT (left)

•An intraoperative photograph demonstrating microanastomoses between anterograde/retrograde internal mammary and DIEP flap vessels (right)

Results

- A total of 25 female patients underwent a prophylactic VLNT and DIEP flap breast reconstruction (mean age: 47.6 years and BMI: 30.8 kg/m²). All patients received chemotherapy (neoadjuvant: 19 vs. adjuvant: 6). An average of 21.7 nodes (range: 8-44) were removed during the AND. Five had a history of smoking, four suffered from hypertension, and two patients were diabetic. Thirteen patients underwent bilateral breast reconstruction, and the remaining patients received a unilateral DIEP flap.
- There were no flap losses. Four patients suffered from wound healing in the reconstructed breast, and two patients developed wound healing complications in the abdominal donor site.

Lymphedema follow-up

- With an average follow-up of 30.3 months, one patient (4.0%) developed lymphedema of the arm. At 6 months following her reconstruction, patient was taken to the operating room for a single LVB. Her volumetric measurements improved from an increase of 14.3% compared to her contralateral arm at 6months to 7.8% at 18 months postoperatively.
- No patients developed an infection or cellulitis following reconstruction. Volumetric measurements did not demonstrate any increase in volumes when compared to baseline measurements in any other patient.
- One patient passed away from recurrent metastatic disease 13 months following reconstruction but had not developed lymphedema prior to her passing.

Conclusion

In conclusion, we share our early experience of performing a prophylactic VLNT at the time of deep inferior epigastric perforator (DIEP) flap breast reconstruction.

Patients with advanced stage breast cancer who require an axillary node dissection, chemotherapy, and radiation are at exceedingly high risk for developing lymphedema. Performing a simultaneous lymph node transfer at the time of autologous free flap breast reconstruction can potentially reduce the risks of breast cancer related lymphedema with low morbidity and without increased hospital stay or recovery. Preliminary outcomes are compelling, but larger numbers with longer follow-up are needed.