

# Prospective Screening for Lymphedema Following Treatment for Breast Cancer

M. N. Skolny, J. O'Toole, L. Jammallo, C. Miller, M. Swaroop, C. Ferguson, M. Specht, A. G. Taghian  
1 Department of Radiation Oncology, Massachusetts General Hospital, Boston, USA

▲ The development of lymphedema after breast cancer treatment can be an irreversible condition that negatively impacts survivors' quality of life. While improvements in breast cancer therapy have resulted in a decrease in treatment related morbidity, there is still a lack of evidence based guidelines concerning when and what type of treatment intervention is optimal for preventing or ceasing lymphedema progression. Previous research studies have suggested that early detection and intervention may prevent edema progression. However, to date, there have been no trials that have yielded the level I evidence necessary to support or refute this hypothesis (1).

The use of a prospective screening model has been established as a successful method to allow for the early identification and intervention of various diseases. In 2012, the National Lymphedema Network published their position paper, "Screening and Early Detection of Breast Cancer-Related Lymphedema: The Imperative," which addresses their recommendation that early detection and intervention for subclinical or stage 0 edema helps cease the progression of low level volume changes to chronic edemas (2). In order to identify minimal arm volume increases that may be indicative of the onset of lymphedema, patients should be systematically screened in a prospective fashion. A 2011 report by Stout et al., indicated that the direct cost of the surveillance approach was \$636.19 per patient per year compared to \$ 3124.92 per patient per year in a non surveillance model (3). Therefore, the prospective approach would positively impact the patient and would reduce the financial burden on the medical system.

This article details a large academic based medical center's experience implementing a prospective lymphedema screening program in a multidisciplinary breast center. At Massachusetts General Hospital, all newly diagnosed breast cancer patients are enrolled into a prospective screening program. Per the screening protocol patients' arms are measured with a perometer pre-operatively and every 3-7 months post-operatively throughout their breast cancer treatment and follow up care. Arm volume changes are quantified using a relative volume change

Report on: Lymphedema following treatment for breast cancer: a new approach to an old problem.

Crit Rev Oncol Hematol  
2013;88(2):437-446.

provider to view and assess in combination with any patient reported symptoms or changes.

The data collected from this screening program has provided important insight into the natural history of lymphedema. According to Specht et al., patients who experienced an arm volume increase of  $\geq 3\%$  -  $<10\%$  within 3 months of surgery are more likely to develop lymphedema (7). This further supports the need to periodically screen patients with a quantitative measurement method to identify patients who may demonstrate low level volume increases that may be indicative of future lymphedema development. Trends in arm volume increases should be considered along with known risk factors of axillary lymph node dissection, radiation therapy to the axillary region and high body mass index (BMI) at the time of breast cancer diagnosis when counseling patients on their individual risk of developing lymphedema (7-9). High risk patients may benefit from close monitoring for

(RVC) equation which incorporates preexisting asymmetries between the limbs captured at the time of their preoperative baseline measurement (4-6). Arm volume measurements are then entered into the patient's electronic medical record for the



Fig. 1: This patient has a RVC of 5% in her right arm. It is difficult to see this mild increase on visual inspection. This mild increase was detected on perometry which allowed for early treatment intervention which may have helped prevent the progression of her edema into a more chronic state. These low level volume changes may go undetected if the patient is not routinely screened with a validated measurement device.

lymphedema during their follow up appointments with their oncology team.

## References

1. Lasinski BB, McKillip Thrify K, Squire D et al. A Systematic review of the evidence for complete decongestive therapy in the treatment of lymphedema from 2004 to 2011. *PM R* 2012;4(8):580-601.
2. National Lymphedema Network Supplement to National Lymphedema Network Position Statement Breast Cancer Screening. Screening and Early Detection of Breast Cancer-Related Lymphedema The Imperative. Available at : <http://www.lymphnet.org/pdfDocs/nlnBCLE.pdf>
3. Stout NL, Pfalzer LA, Springer B et al. Breast Cancer-related lymphedema: comparing direct costs of a prospective surveillance model and a traditional model of care. *Physical Therapy* 2011; 92(1):152-163.
4. Ancukiewicz M, Miller CL, Skolny MN et al. Comparison of relative versus absolute arm size changes as criteria for quantifying breast cancer-related lymphedema: the flaws in current studies and need for universal methodology. *Breast Cancer Research and Treatment* 2012;135(1):145-152.
5. Ancukiewicz M, Russell TA, O'Toole JA et al. Standardized method for quantification of developing lymphedema in pati-

ents treated for breast cancer. *International Journal of Radiation Oncology. Biology, Physics* 2011;79(5):1436-1443.

6. O'Toole J, Jammallo LS, Miller CL et al. Lymphedema following treatment for breast cancer: A new approach to an old problem. *Crit Rev Oncol Hematol* 2013;88(2):437-446.

7. Specht MC, Miller CL, Russell TA et al. Defining a threshold for intervention in breast cancer-related lymphedema: what level of arm volume increase predicts progression? *Breast Cancer Res Treat* 2013;140(3):485-494.

8. Warren LE, Miller CL, Horick N, Skolny MN et al. The Impact of Radiation Therapy on the Risk of Lymphedema After Treatment for Breast Cancer: A Prospective Cohort Study. *Int J Radiat Oncol Biol Phys* 2014;88(3):565-571.

9. Jammallo LS, Miller CL, Singer MB et al. Impact of body mass index and weight fluctuation on lymphedema risk in patients treated for breast cancer. *Breast Cancer Res Treat* 2013;142(1):59-67.

---

## Correspondence address

Melissa M. Skolny  
Department of Radiation Oncology  
Massachusetts General Hospital  
Boston, MA 02114, USA  
E-Mail: [mskolny@mgh.harvard.edu](mailto:mskolny@mgh.harvard.edu)