Upper Limb Swelling Following Mastectomy: Lymphedema or Not?

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BH is a 54-year-old white, married female with a health history significant for depression at the time of breast cancer diagnosis. She was scheduled for a routine bilateral mammogram in the summer of 2001. Following an abnormal mammogram of the right breast, BH was referred for an excisional biopsy, which was performed in July 2001.

Two weeks later she was informed of the breast cancer diagnosis: infiltrating ductal carcinoma, poorly differentiated, stage I. At that time, it was recommended that she undergo a right total mastectomy, performed 4 weeks later, at which time she also underwent a sentinel lymph node biopsy revealing 0/1 positive lymph node(s). BH was then referred for four cycles of chemotherapy (doxorubicin and cyclophosphamide), which began in September 2001 and ended 9 weeks later. The chemotherapy regimen was delayed when BH developed a systemic infection secondary to low white blood cell counts and a locally inflamed nail bed on her right hand. She received a course of intravenous antibiotics for 11 days as an inpatient in a rural hospital near her home. She recovered from the infection without further complications. Radiation therapy was not recommended. Due to the fact that her tumor was not estrogen- or progesterone-receptor-positive, no antiestrogen therapy was prescribed. Although at her first visit BH reported that her maternal niece and maternal first cousin had also been diagnosed with breast cancer, there was no family history of lymphedema and the patient had never reported a diagnosis of lymphedema. The patient reported that her right arm felt weaker than her left since her surgery in 2001, and she was not able to lift heavy objects. She also stated, "My right arm always feels different than the left." In addition, she reported that her right hand swelled periodically. She performed self-massage when that occurred. At various visits, she reported an ache in her right arm and numbness in the right axilla.

Nursing Management

In August 2001 BH enrolled in a federally funded research study that aimed to follow newly diagnosed breast cancer patients from before surgery through 30 months after surgery.[1] At the preop assessment, she was informed about the study and consented to participate. On that day, her arms were measured by circumference (using a 4-cm protocol with established inter-rater reliability by trained research nurses) and perometry (an infrared laser optoelectric measuring device that measures limb volume and shape).[2] In addition, a symptom assessment was conducted by the research nurse using a reliable and valid interview tool.[3] BH was seen again immediately after surgery and every 3 months for 1 year, followed by appointments every 6 months for the next 3 years. Scheduled visits were missed at 9 and 12 months postop due to pain that prevented the patient from traveling the 3-hour distance to the cancer center.

BH's preop (baseline) bilateral limb measurements were very similar, within 2 mL perometer volume (2,288 vs 2,287 mL mean volume, following three measurements on each arm); see Table 1. Postop (2 weeks after surgery), the affected limb had increased by a mean volume of 148 mL (2,436 mL). The nonaffected limb had also increased by 184 mL (2,471 mL), indicating the increase was more likely due to postsurgical fluid retention and related weight gain leading to bilateral limb volume increases than due to postmastectomy lymphedema. At 3 months after surgery, both limbs returned to baseline limb volume (2,233 vs 2,253 mL, a nonsignificant bilateral difference of 20 mL). Anthropometric measurements continued to document overall bilateral symmetry in limb volume over the months following surgery (Table 1). For example, the bilateral limb volumes were nearly identical at 18 months after surgery (2,261 vs 2,269 mL). The volume of the right (breast...
cancer-affected) limb ranged from 2,210 to 2,532 mL (range of 322 mL) over the 4 postop years BH was followed in the study, whereas the volume of the left (nonaffected) arm ranged from 2,269 to 2,620 mL (range of 351 mL). The right arm increased 244 mL over baseline (10.6%), while the left (nonaffected) arm increased 333 mL over baseline (14.6%) at 48 months.

At no time was BH diagnosed with lymphedema, although she reported experiencing occasional swelling of the affected (right) hand. Over the 4 years BH was followed in the study, her weight ranged from 169 pounds at preop baseline to 204 pounds at 48 months postop (a change of 20.7%). At 9 to 12 months postop, when she was unable to travel to the cancer center for her next scheduled appointment(s) due to back and neck discomfort, she was referred to physical therapy near her home, some 3 hours from the cancer center where her follow-up care was done, for the aching and numbness in her axilla and severe pain in her cervical area and upper back. A regimen of physical therapy led to increased range of motion in the right shoulder and decreased pain in the neck and upper back. The numbness and aching in the right axilla continued, likely related to postsurgery neurologic injury. Education on risk reduction self-care practices for persons at risk for lymphedema[4] was carried out preop, postop, throughout her follow-up care, and during her physical therapy. BH reported that she continued on antidepressant medication throughout the follow-up time.

### Summary

Having experienced an excisional biopsy, sentinel lymph node biopsy, and mastectomy, BH is at lifetime risk of developing post-breast cancer lymphedema in the arm on the side where her breast cancer was treated. She has two additional risk factors, among those documented in the literature: history of an infection (specifically a systemic infection, significant in that it required hospitalization for intravenous antibiotics) in the postsurgery period, and a moderate increase in bilateral limb volume and weight (body mass index) over the months and years following the breast cancer diagnosis. Further, the patient reported transient hand swelling on the affected side and gradual weight increase are cues indicating a need for patient vigilance and careful monitoring by the
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Preventing future infections, managing weight at an optimal level, and preventing trauma or injury to the affected arm and chest are important self-management precautions to reduce risk of chronic lymphedema development. BH needs continued support in reviewing evidence-based risk-reduction guidelines[4] and understanding ways to apply them to her lifestyle.

In the absence of preoperative baseline or contralateral limb measurements (with circumferences or perometry or water displacement),[2] assessment of limb change at a level identified as diagnostic of lymphedema (commonly, 200-mL volume or 2-cm girth increase from baseline or as compared to the contralateral limb) is very challenging. Without bilateral preop limb measurements for baseline and contralateral limb comparisons, BH might have been diagnosed with lymphedema at postop or at 48 months, when both limbs increased symmetrically. Symptom assessment is also crucial, as symptom report of heaviness and swelling is found to be associated with limb volume changes indicative of lymphedema.[3] Transient hand swelling may be evidence of latent lymphedema and cause for increased risk-reduction education and vigilance in assessment for emergence of nonresolving chronic lymphedema.

Discussion

It is estimated that in 2006 more than 212,000 individuals were newly diagnosed with breast cancer in the United States.[5] Over 2 million American women are breast cancer survivors. According to the American Cancer Society,[6] every person treated for cancer with lymph node removal, surgery, or radiation has a lifetime risk for lymphedema, swelling caused by an increase in protein-rich interstitial fluid. Some will develop lymphedema soon after cancer treatment (within weeks or months) and others may not experience lymphedema until many years later (even 20 years later).[6-8] Some suggest that those who experience injury to the lymphatic system through lymph node removal or radiation have latent lymphedema, that is, lymphedema that is not yet measurable or observable, but exists in a dormant state.[9] Further, lymphedema may exist in an acute and transient state that is reversible spontaneously or with intervention, or (as is generally found) as a chronic and irreversible (although manageable) condition.[6] It is estimated that 20% to 40% of breast cancer survivors will experience lymphedema during their lifetimes.[6-8,10] Many individual factors, some not yet identified, and certain treatment factors contribute to an individual’s risk of developing lymphedema over the lifetime following breast cancer treatment. Through continued research and subsequent clinical teaching based on the body of existing evidence, progress will be made in minimizing occurrence and appropriately managing post-breast cancer lymphedema.

References:


Lippincott Williams & Wilkins, 2001.


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