

Early Assessment for Prevention of Breast Cancer—Related Lymphedema

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ABSTRACT

Breast cancer—related lymphedema (BCRL) is an incurable, disfiguring, progressive complication occurring after breast cancer treatment. BCRL is difficult to treat and is characterized by significant and persistent swelling. Lymphedema is the most common morbidity resulting from breast cancer treatment. Therefore, BCRL should be assessed during clinic visits in oncology and primary care settings. An evidence-based algorithm for early detection of BCRL in primary care settings is presented with explanations of the protocol elements.

Keywords: algorithm, breast cancer, lymphedema, prevention, protocol

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Breast cancer is the second leading cause of cancer death in women, and based on recent estimates, 1 in 8 women in the United States will be diagnosed with this disease in her lifetime.¹ The diagnosis of breast cancer has risen consistently over the past 25 years due to improved detection.¹ Furthermore, breast cancer is the most common cancer in women worldwide, with nearly 1.7 million new cases diagnosed, representing about 12% of new cancer cases and 25% of all cancers in women.² At the same time, advances in breast cancer management have increased the number of survivors, which directs the focus of care to the long-term consequences of successful interventions.³ It is estimated that there are nearly 3 million breast cancer survivors in the United States.⁴ Worldwide, the top 20 countries with the highest proportion of cancer survivors still alive after 5 years account for 1.3 million survivors. The highest proportions of these women reside in North America and Europe.² Although advances in breast cancer surgery and adjuvant treatments have extended life expectancy, each treatment modality has resulted in associated complications and morbidities.

Breast cancer—related lymphedema (BCRL) is an incurable, disfiguring, progressive complication that is the most common morbidity resulting from breast cancer treatment.⁵ Lymphedema is a global problem for breast cancer survivors, and statistics from outside

the United States are difficult to obtain. Furthermore, it is challenging to treat and characterized by significant and persistent swelling, along with an accumulation of protein-rich, infection-prone fluid in the affected area.⁶ The edematous area is characteristically the arm on the same side as the involved breast; however, BCRL can also affect other regions of the trunk, including breasts, axillae, or scapulae, in addition to areas affected by infection or reconstruction.⁷

Initial visible manifestations of BCRL can be subtle, developing gradually or abruptly. Patients are often unaware of the need to report early symptoms; consequently, nurse practitioners (NPs) may fail to make an early diagnosis that could limit progression of BCRL. Late-stage symptoms of BCRL are a frequent reason for patients seeking primary care; however, proactive strategies, such as use of diagnostic guidelines to assess early BCRL symptoms are not characteristically initiated in primary care clinics.⁸ Major factors contributing to the challenge of BCRL include the complexity of the disease, lack of clinician knowledge of the BCRL disease process, poverty, and cultural and racial disparities in health care.⁹

Despite best intentions, efforts to manage BCRL in primary care settings can result in unintended consequences that arise from the lack of a protocol for assessment and management. Primary care NPs

may have difficulty understanding and managing BCRL symptoms without a standardized protocol to apply in an ambulatory care setting. Thus, the BCRL diagnosis and referral to a lymphedema specialist are often delayed until the patient's activities of daily living are impaired.¹⁰

Researchers suggested that enhanced primary care provider awareness and patient education may help reduce the risk of BCRL complications through early clinical assessment and prompt referral to specialist care.³ Therefore, the purpose of this article is to describe the needs assessment of primary care clinicians' knowledge of early detection of BCRL in central Texas and the subsequent development of a practice protocol for use in ambulatory care settings. By employing the evidence-based diagnostic algorithm presented here, clinicians can play an important role in the early assessment and referral of patients with BCRL, which has the potential to significantly improve the quality of life (QoL) for breast cancer survivors.³ As expressed by one breast cancer survivor, BCRL is "a constant reminder of my cancer. You cannot really forget that you have had cancer because you are reminded of it every day" (p. 24).¹¹

BACKGROUND

Breast cancer–related lymphedema results from trauma to the lymphatic system that can occur with breast cancer treatment.¹² Treatments for breast cancer are generally divided into 2 categories: local treatment of breast or lymph gland regions, which includes surgery and radiation; and systemic treatments, such as chemotherapy. Treatment modalities can be used in combination, and all treatments are associated with both short-term and long-term sequelae. Breast cancer treatments affect immune functions and the ability to effectively transport lymph throughout the body. Surgical procedures such as radical mastectomies or extensive axillary lymph node dissections are key factors in BCRL development.⁵ Although sentinel lymph node biopsy may result in the same complications, there is a lower incidence of sequelae such as lymphedema, shoulder mobility, and pain associated with this procedure.¹³ Radiotherapy also has the potential to cause fibrosis

and constriction of the underlying tissue of the lymphatic system.¹⁴

Although surgery and radiotherapy are thought to be the primary factors associated with BCRL development, chemotherapy is considered to be a confounding factor contributing to the complications and severity of BCRL. Chemotherapy is a medically complex series of treatments, often using multiple medications, any of which may produce BCRL. These medications can cause peripheral edema in 52% of women receiving this mode of therapy. Peripheral edema ultimately creates a blockage in the lymphatic system, preventing the flow of lymph fluid, which can cause lymphedema. Patients who require chemotherapy beyond the usual number of 6 cycles may develop peripheral edema as a consequence of prolonged use of the drugs.¹⁵

Incidence of BCRL

The actual number of patients with lymphedema is hard to determine, with ranges of 3% to 65%, depending on the treatment, method of lymphedema diagnosis, and follow-up.⁵ Incidence reports cataloging precise numbers of BCRL diagnoses are inconsistent because of the limited number of prospective studies examining the determinants of BCRL, the types of cancer therapy, and comprehensive follow-up evaluations after treatment. No long-term cohort studies of BCRL are available, despite the substantial morbidity associated with arm swelling. Few studies have assessed the cumulative incidence of BCRL symptoms using a prospective study design. Although BCRL is a possible consequence of the treatment regime for breast cancer, it is often overlooked during the acute phase of cancer treatment and consequently is underdiagnosed.¹⁶ Data indicate that 75% of BCRL cases occur in the first year after surgery, and 90% occur within 3 years among patients who are monitored for this complication.⁵

The severity of BCRL is divided into the following categories:

- Grade 1 (Mild): Pitting edema by applying pressure,
- Grade 2 (Moderate): Edema that becomes larger and firmer to the touch, and

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