

Localized Dermal Backflow on ICG Lymphography in Female Breast Cancer Survivors Without Breast Cancer-Related Lymphedema After Axillary Lymph Node Dissection

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Background

- Lymphedema surveillance programs aim to prevent breast cancer-related lymphedema (BCRL) after high-risk interventions including axillary lymph node dissection (ALND).
- BCRL surveillance programs utilizing indocyanine green (ICG) lymphography have previously reported that the antecubital fossa is the most common site for early development of subclinical lymphatic dysfunction. There is no consensus in the management of isolated abnormal findings on ICG lymphography.
- We recruited female breast cancer survivors ≥ 2 years after ALND without BCRL for long-term BCRL surveillance follow-up with ICG lymphography to map the superficial lymphatic anatomy of the at-risk arm.

Methods

- Twenty (20) female breast cancer survivors without a history of BCRL who were treated with ALND at least two years prior to study enrollment were recruited.
- BCRL surveillance measurements with limb volumetry and bioimpedance spectroscopy (L-dex) were performed to exclude BCRL diagnosis prior to ICG lymphography.
- Lymphatic imaging in the at-risk arm was performed with ICG lymphography using a standardized protocol. Abnormal, nonlinear findings on ICG lymphography were further characterized.

Table 1. Volunteer eligibility criteria

Inclusion Criteria	Exclusion Criteria
• Assigned female sex at birth • Identify as female • At least 18 years of age • Previous diagnosis of breast cancer • Breast cancer treated with unilateral axillary lymph node dissection (≥ 10 lymph nodes) at least 2 years prior to study enrollment	<i>Prior history of:</i> • Surgical procedures to upper extremity or axilla, other than axillary lymph node dissection • Chronic inflammatory conditions (e.g. rheumatoid arthritis) • Filarial infections • Lymphedema • Upper extremity deep vein thrombosis • Congestive heart failure • Venous thoracic outlet syndrome • Iodine allergy • Currently pregnant • Currently breastfeeding • Currently active breast cancer

Results

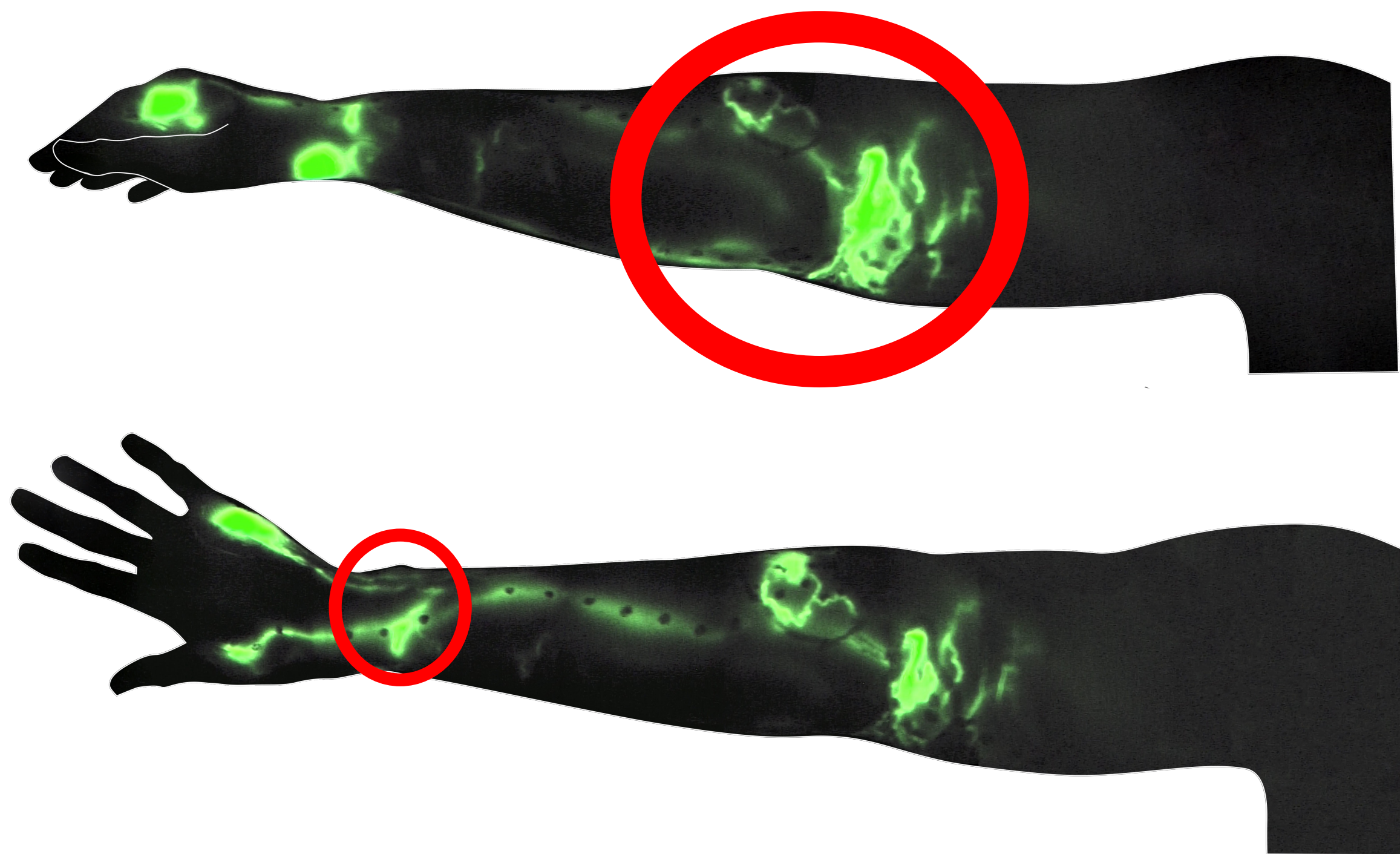


Figure 1. Superficial lymphatic anatomy of the at-risk arm in a volunteer. Nonlinear patterns were observed in the antecubital fossa and the dorsal wrist on ICG lymphography.

- The median time from ALND was 11.2 years (Q1-Q3: 4.1-14.6)
- Abnormal, nonlinear findings were observed in the at-risk arms of 70% (14/20) of volunteers
- Abnormal, nonlinear findings were most common in the antecubital fossa, present in 78% (11/14) of volunteers.

Discussion and Conclusion

- The most common site of abnormal, nonlinear ICG lymphography findings was the antecubital fossa, consistent with early presentation reported by surveillance studies.
- Abnormal findings in the antecubital fossa may represent superficial to deep collateralization or collateralization of the articular superficial lymphatic plexus.
- These findings expand the spectrum of normal lymphatic anatomy and function in women without BCRL and may represent stable collateralization rather than disease.