

Major Anatomic Variations of the Lateral Upper Arm Lymphatic Pathway in Breast Cancer Survivors Without Lymphedema

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Background

Results

- **Variations of upper extremity lymphatic anatomy** have been theorized to reduce an individual's risk of developing breast cancer-related lymphedema (BCRL)
- Prior cadaveric and in-vivo studies have described the **lateral upper arm (LUA) pathway as a protective anatomic variant**
- We **evaluated the LUA pathway in breast cancer survivors** without BCRL following axillary lymph node dissection (ALND)

Methods

- Breast cancer survivors without BCRL at least 2 years after ALND underwent lymphatic mapping of the at-risk upper extremity using indocyanine green (ICG) lymphography
- LUA pathway phenotype, continuity with forearm lymphatic channels, and proximal visualization were assessed with immediate (t = 0 hours) and delayed (t = 6 hours) imaging

- LUA pathway observed in 89% (24/27) of volunteers
- **Immediate** imaging: 56% long bundle and 33% short bundle
- **Delayed** imaging: 15% converted from short to long bundle
- Proximal visualization to deltopectoral groove most common (83%), with no difference between bundle phenotypes

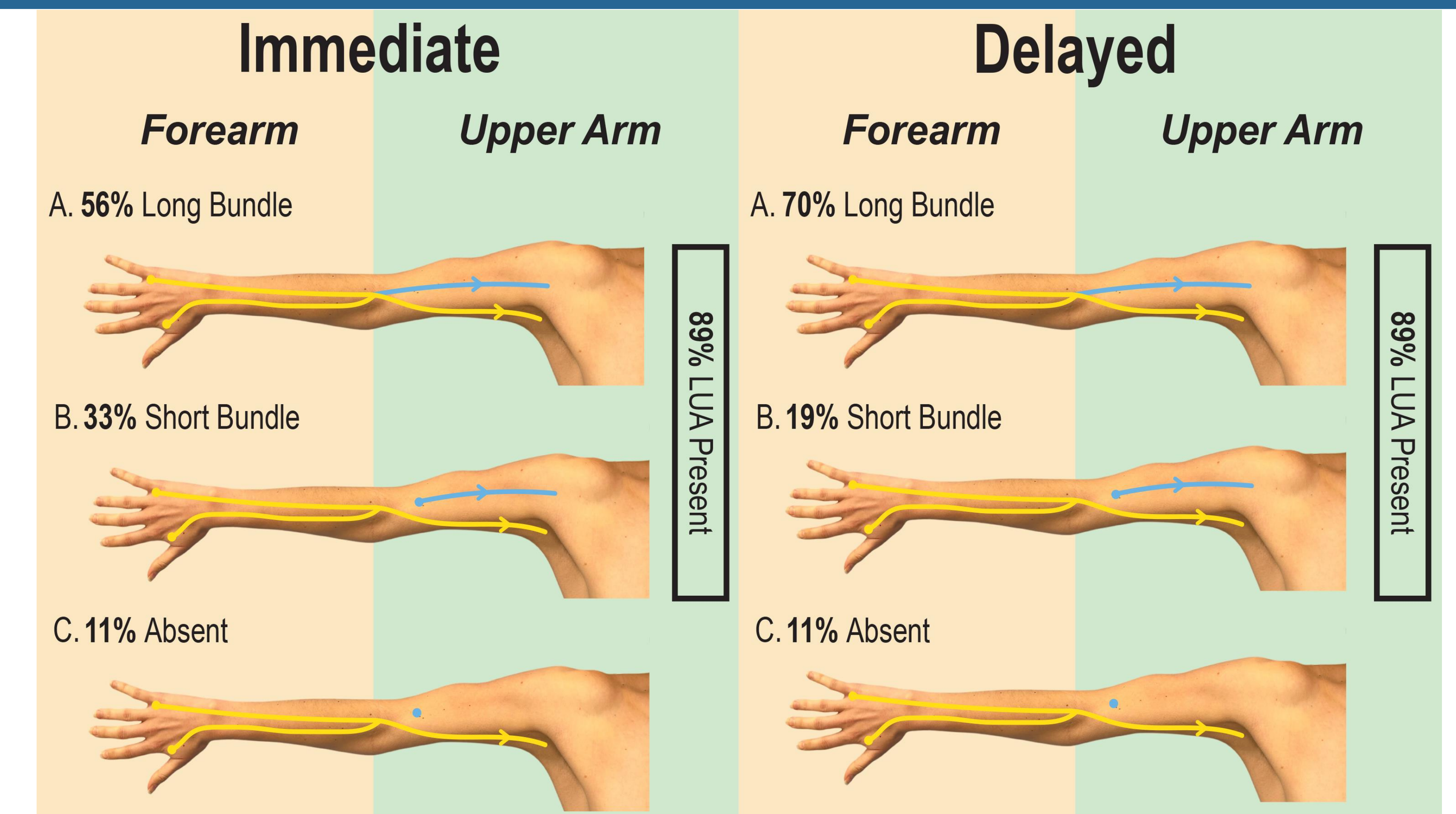


Figure 1. Schematic of the anatomical variants of the LUA pathway at the immediate (t = 0 hours) and delayed (t = 6 hours) timepoints. A long bundle represents a LUA pathway (blue line) in continuity with one or more forearm channels (yellow lines) while a short bundle lacks forearm continuity.

Conclusions

- In breast cancer survivors without BCRL after ALND, the **short bundle phenotype was less prevalent (19%)** than previously reported in healthy female (29%) and female pre-ALND breast cancer populations (41%)
- The short bundle phenotype may be less protective than the long bundle phenotype
- Preserved proximal drainage to the deltopectoral groove may confer increased resistance to BCRL