Full Title

Synchronous Cancers of the Breast and Upper Limb - A Unique Anatomical Perspective.

Short Title

Learning from Synchronous Breast Cancer & Melanoma

Authors

Dr Ben M Harrison (B.Sc, MBBS)

1. *St John of God Subiaco Hospital, WA, Australia*

Dr Tarek Meniawy (MBBS, PhD)

1. *St John of God Subiaco Hospital, WA, Australia*

2. *UWA Medical School, The University of Western Australia, WA, Australia*

Professor Cristobel Saunders (MBBS, PhD)

1. *St John of God Subiaco Hospital, WA, Australia*

2. *UWA Medical School, The University of Western Australia, WA, Australia*

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Corresponding Author

Dr Ben M Harrison

Medical Education Unit

St John of God Hospital Subiaco

12 Salvado Rd,

Subiaco WA 6008

Phone: 0410 588 406

Email: bmharrison@me.com

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Case Report

A 50-year-old pre-menopausal woman presented with a self-detected, mammographically occult lump in her left breast. Her medical history was unremarkable with the exception of prior basal and squamous cell carcinomas. All previous mammograms had been normal and she reported no other breast issues. Both of her children were breastfed. Her mother had breast cancer at the age of 71. Examination showed a 2cm mass in the left lower, outer quadrant and subsequent core biopsy determined the mass to be an ER/PR +ve, HER2 -ve invasive lobular carcinoma (ILC). A wide local excision (WLE) and sentinel lymph node biopsy (SLNB) revealed a 22mm Grade 2 classical ILC without nodal involvement (0/4).

One week after surgery she presented to her General Practitioner with a longstanding papule on her left forearm. The original flat, hyperkeratotic lesion had been treated with cryotherapy 12 months earlier and over the subsequent 6 months, a thickened and non-pigmented 8mm papule had developed at the periphery of the cryotherapy site. A shave biopsy revealed an invasive melanoma (Clark Level 4, Breslow Thickness 2.4mm with ulceration and perineural invasion, BRAF wild type). She underwent a wider excision, lymphoscintigram and SLNB from a separate axillary nodal basin. There was no local residual melanoma, but the node contained a very small (approximately 1mm) deposit of tumour. Despite the detection of nodal spread, a full axillary clearance was not performed as per the current Australian Guidelines on Management of Melanoma¹. Subsequent staging PET was negative, and the final stage was determined to be IIIC (T3bN1aMo).

Discussion

This is a case where synchronous cancers of primarily lymphatic spread have occurred in 2 separate regions related by close lymphatic drainage pathways and necessitated separate lymphoscintigraphic studies as part of the diagnostic workup (images 1 and 2). Herein lies a unique opportunity to examine 2 synchronous, clinically justifiable (albeit different) imaging studies of the lymphatic drainage of the breast and arm. We feel that the available imaging and its findings offer a useful and clinically relevant perspective of the anatomy in question.

Both breast cancer and cutaneous melanoma staging, and prognostication rely on the status of the sentinel lymph node draining the tumour^{2, 3}. Cadaveric studies estimate 25% of people have connections between the lymphatic drainage of the upper limb and the breast on the same side⁴. This implies that with more accurate surgical technique, avoidance of damage to upper limb lymphatics and subsequent lymphedema may be possible in the majority of patients while still being able to clear the axilla of nodes draining the breast. More contemporary techniques like axillary reverse mapping (ARM) are being trialled in attempts to preserve the upper extremity lymphatics during ALND. In 2016 a systematic review of ARM studies found lymphoedema rates as low as 5.9% in ALND using ARM to guide nodal resection however metastatic spread was identified in 20% of ARM identified nodes that were resected at the time of the ALND, indicating this technique is not yet ready for clinical practice⁵.

There is data to suggest that re-operative SLNB after earlier SLNB is feasible in breast cancer patients when fewer than 10 nodes were removed during the earlier procedure⁶. As the patient in this case had only 4 nodes harvested during the initial SLNB, we feel the results of the second SLNB are reliable. In 2010 Scoggins et al published the results of a large prospective observational study of 2451 patients looking at factors associated with false negatives SLNB in Melanoma. They reported them to be greater patient age, lower mean tumour thickness, less frequent lymphovascular invasion and greater risk of local or In-Transit recurrence however no mention was made by the authors of previous SLNB within that same lymphatic drainage pathway⁷.

Given that both cancers were diagnosed less than 2 weeks apart, it is reasonable to assume that they were synchronous.

Spread of melanoma was identified to the nodes harvested in the second SLNB but not to the nodes harvested from the first SLNB performed in the initial investigation of the breast cancer. Moreover, a separate sentinel lymph node not identified with injection of tracer into the breast, was subsequently identified with injection of tracer into the forearm in the second

lymphoscintigram. We feel that these factors are strongly suggestive of complete segregation of upper limb and breast lymphatic drainage in this patient, supporting the potential for preservation of upper limb lymphatics with improved surgical technique during axillary surgery for breast cancer.

Author Contribution Statement

Dr Ben M Harrison wrote up the case for submission.

Dr Tarek Meniawy and Professor Cristobel Saunders cared for the patient and reviewed the final write up for accuracy.

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Figures

Image 1: Initial Lymphoscintigram prior to left breast SLNB. Tracer injected into tumour of the left breast.

Image 2: Subsequent PET/CT Lymphoscintigram – 8 weeks after left breast SLNB. Tracer injected into melanoma on left forearm.

ANS_16440_Image 1.png

ANS_16440_Image 2.png

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Author/s:

Harrison, BM;Meniawy, T;Saunders, C

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