Methodology and implications of lymphatic mapping and sentinel lymphadenectomy
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CHAPTER FIFTEEN

False-negative Sentinel Node Procedure Established through Palpation of the Biopsy Wound

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Since completing a learning phase in breast cancer patients, we no longer perform axillary lymph node dissection if the sentinel node is tumour-negative.\(^1\) So far, a false-negative sentinel node biopsy has not been reported after abolishing routine axillary lymph node dissection. In this report, the first such case is described.

**Case report**

A 46 year-old woman was referred to our hospital with a T2N0 right breast cancer. Preoperative lymphoscintigraphy was performed after injection of 119 MBq \(^{99m}\text{Te}\) Technetium-nanocolloid (Nanocoll, Amersham Cygne, Eindhoven, the Netherlands) into the tumour. Dynamic imaging was performed followed by static imaging at 20 minutes, 2 hours and 4 hours post-injection with a dual-head gamma camera (ADAC Vertex, Milpitas, California, USA). An axillary sentinel node was seen with two second-echelon nodes (figure 1).

![Figure 1](image_url)

**Figure 1.** Lymphoscintigram showing one axillary sentinel node with two second-echelon nodes, two hours after injection on the anterior (A) and lateral (B) image. T = tumour site.

Before the incision, 1.0 ml patent blue dye (Laboratoire Guerbet, Aulnay-Sous-Bois, France) was injected into the tumour at four sites. A blue lymphatic vessel was followed to a blue-stained, radioactive lymph node (Neoprobe 1500, Neoprobe Corporation, Dublin, Ohio, USA). The sentinel node was harvested and was found to be free of disease on frozen section investigation. Palpation via the biopsy cavity revealed two firm lymph nodes of less than 1 cm. These nodes contained no radioactivity and were not blue but were removed because of how they felt. One of these two non-sentinel nodes was tumour-positive on frozen section examination. A wide local excision of the primary tumour was performed followed by a complete axillary lymph node dissection. Pathological evaluation showed a 2.1 cm infiltrating ductal carcinoma. Serial-sections of the hot and blue sentinel node at fourteen levels with hematoxylin-eosin staining and immunohistochemical staining confirmed the negative result of the frozen section investigation. The involved non-sentinel node measured 0.4 cm and showed massive tumour invasion. One of the other eighteen axillary lymph nodes contained metastasis as well.
Discussion

Studies of sentinel node biopsy followed by routine axillary node dissection revealed false-negative rates ranging from 0% to 40%. Several explanations for false negative results can be considered. A tumour deposit may block ingress of the tracers and direct the lymph flow to a neo-sentinel node. Van der Ent and co-workers intraoperatively palpated nodes with massive tumour infiltration in the presence of two histologically normal sentinel nodes. A second explanation can be that the hypothesis of step-wise involvement may not be watertight: tumour cells may occasionally pass through a first-echelon node to lodge in a secondary node. Thirdly, the lymph flow within an individual is variable over time and not always to the same lymph node(s). A sentinel node will pass unnoticed when it does not receive lymph flow from a particular tumour site at the time when the tracer is administered. The fourth explanation of a false negative sentinel node biopsy can be the inexperience of the surgeon and nuclear medicine physician. Finally, a micrometastasis in the sentinel node can be missed by the pathologist because the number of sections is limited. In conclusion, relying on sentinel node status to decide on axillary node dissection will occasionally lead to understaging. The exact incidence and the repercussions of this phenomenon are still unknown at this time. We recommend palpation of the sentinel node biopsy wound to minimise the incidence of understaging as a result of false-negative sentinel node biopsy.

References
