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Letters

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The Value of Pre-operative Lymphoscintigraphy in Breast Cancer Treatment

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JUST AS lymphatic mapping is changing routine surgical care for patients with melanoma [1], it seems likely that the same will occur in breast cancer [2]. In a recent article, Albertini and associates [3] reported using peritumoral injections of filtered technetium-labelled sulphur colloid and 1% isosulphan blue to locate 'sentinel' lymph nodes accurately [4] in the axillae of patients with breast cancer using a gamma probe at the time of surgery. They emphasised the importance of detecting micrometastases in regional nodes, not only because their presence predicts survival, but also because it determines eligibility for adjuvant protocols and influences treatment decisions. However, these authors were unable to locate sentinel nodes in the internal mammary chain because of interference from primary site activity, and did not pursue this as biopsy or full dissection of internal mammary nodes is not a part of contemporary surgical treatment for invasive breast cancer.

We consider that it is important to identify all sentinel nodes if the sentinel node biopsy method is to determine accurately the lymph node status of a patient with breast cancer. It is not logical to ignore the internal mammary chain, or for that matter the supraclavicular region, either of which may contain sentinel nodes. Full nodal staging will not be achieved unless sentinel nodes in these node fields are sampled.

We suggest that these nodes can usually be located if pre-operative lymphoscintigraphy (LS) is made part of the sentinel node biopsy procedure. LS and sentinel node marking are most conveniently performed the day before surgery, since there is adequate radioactivity remaining in the sentinel node to allow its detection with a gamma probe 24 h later. There are several advantages to this approach — logistics are greatly simplified, the exposure of operating room staff to ionising radiation is markedly reduced, and the sentinel node to background ratio is improved, facilitating detection with a gamma probe during surgery [5].

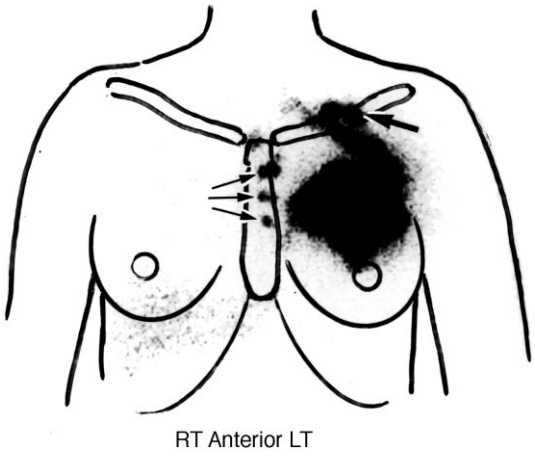

Figure 1. Lymphoscintigram of a patient with a small tumour located centrally in the breast just above the level of the nipple. The study was acquired 3 h after four injections of ^{99m}Tc antimony sulphide colloid (each injection 5 MBq in 0.05 ml) had been placed immediately above, below, medial and lateral to the tumour, under ultrasound control. Sentinel lymph nodes are seen in the left internal mammary chain (thin arrows) and in the supraclavicular fossa (thick arrow). There was also a single sentinel node in the left axilla; this was best seen in the left lateral view (not shown) but is obscured by bloom around the injection sites in the anterior view.

Our experience with mammary lymphoscintigraphy has indicated that sentinel nodes in the internal mammary chain occur in 35% of patients with breast cancer and sentinel nodes occur in the supraclavicular node field in 15% [6]. This suggests that if only an axillary sentinel node sampling procedure is performed, at least 1 in 3 patients may harbour undiagnosed micrometastases in sentinel nodes in these other node fields (Figure 1). All sentinel nodes are readily imaged by LS and their location can be marked on the overlying skin. Another benefit of mammary LS is that patients with internal mammary sentinel nodes can receive radiotherapy to this region, whilst it can be avoided in the 65% of patients who do not show such drainage.

It has been clearly established that accurate determination of the axillary nodal status in patients with breast cancer, itself provides valuable prognostic data and helps in selecting patients for adjuvant chemotherapy. It follows that determination of the full nodal status in such patients by sampling sentinel nodes in the internal mammary and supraclavicular node groups should allow even more precise prognostication and more rational therapeutic decision-making. Routine pre-operative mammary LS will make this an achievable objective.

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Radioguided Surgery of Occult Breast Lesions

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THE EXTENSIVE use of mammography and ultrasonography in clinical practice and for early diagnosis has resulted in a major increase in the detection of occult breast lesions [1, 2]. Clusters of microcalcifications or small opacities of irregular outline may be early signs of a malignancy which is generally well-suited to treatment by breast-conserving surgery. However, surgery must be preceded by precise localisation since the lesion is not palpable. Several localisation techniques are used [3], the most common being to introduce a hooked wire [4, 5] or to inject a path of sterile carbon particles to the lesion, and while each method has its advantages none can be considered ideal [6, 7].

At the European Institute of Oncology, Milan, we have developed a new localisation technique called ROLL (radioguided occult lesion localisation). This involves the inoculation of particles of colloidal human serum albumin, 10–150 μm in diameter (Macrotec, Sorin Biomedica, Saluggia, Italy), labelled with approximately 3.7 MBq of radioactive technetiun (^{99m}Tc), directly into the lesion during mammography or ultrasonography.

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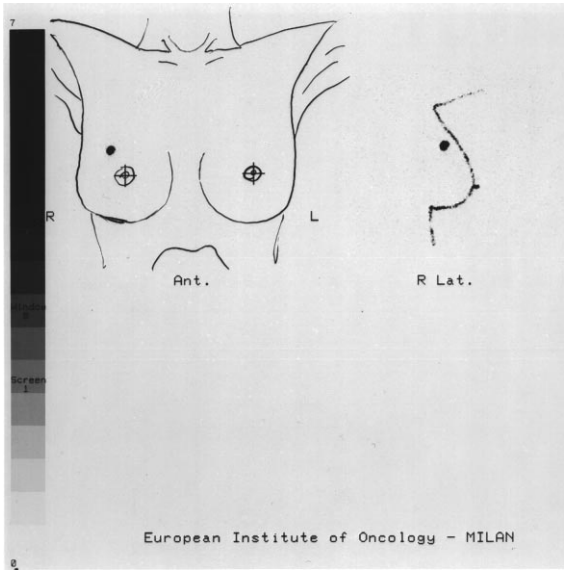

Figure 1. Anterior and lateral projections of the location of the lesion on scintigraphy.

Correct inoculation is verified by superimposing the mammographic image over a scintigraphy scan of the breast. The scintigraphic image is available in the operating room to assist the surgeon in locating the lesion (Figure 1); comparison reveals the presence of any mismatch between the radiological lesion and the point of radioactivity injection.

A gamma detecting probe is then used to locate the lesion as a hot spot. By means of this probe, the surgeon can locate the skin projection of the lesion with precision and hence decide on the most appropriate incision. More importantly, however, the probe is used as often as necessary during surgery to check the position of the lesion. In this way a portion of breast tissue containing the lesion at its centre can be removed, guaranteeing oncological radicality (if the lesion turns out to be malignant) but at the same time avoiding excessive mutilation. This possibility of verifying at any time distinguishes the technique from more conventional methods, and also makes the operation quicker and easier.

There is negligible radiation risk for the patient and health staff. Dose levels are of the order of 0.1 mCi, equivalent to 0.01 of the dose received during bone scintigraphy, or more simply, less than the radiation received during a flight from Rome to New York!

Analysis of the 196 patients with clinically occult breast lesions operated on from March 1996 to April 1997 has shown the technique to be highly satisfactory and reliable, so that it is now in routine use at our institute.

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