lymphoscintigram and <12 hours time interval between the radioisotope injection and axillary incision. 262 patients had a positive SLN.

Table 1. Number and percentage of patients with metastasis to sentinel lymph nodes by site examined.

Number of SLN sites examined	Number of pts with a positive SLN	Cumulative percentage with positive SLN
1	221	84.4%
1 or 2	250	95.4%
1, 2 or 3	258	98.5%
1, 2, 3 or 4	261	99.6%
1–9	262	100%

Conclusion: 99.6% of positive SLNs were identified within the first four nodes sampled. Only one patient had the first positive SLN in node number six. These data suggest that the upper threshold for the number of SLNs that should be removed is probably 4. Removal of more than 4 SLNs did not increase the accuracy of finding a positive node.

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Lymph node metastases detection by FDG-PET and sentinel node biopsy in breast cancer patients: comparison of these different approaches

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Background: axillary involvement is the main factor used to plan adjuvant treatments for breast cancer (BC) patients. Recently, sentinel node (SN) biopsy has been suggested as method of reference for the evaluation of regional nodal metastases and for the decision on the need of a ALND. SN biopsy is an invasive approach, with a not negligible risk of false negative results. Conversely, Positron Emission Tomography (FDG-PET) is a non-invasive repeatable method able to evaluate all the regional nodes in BC: our PET experience on nodal involvement in BC has given interesting data of sensitivity and negative predictive value, comparable with SN biopsy. The aim in this work is a direct comparison between the two methods in term of sensibility, accuracy and predictive value in the same series.

Methods: T1N0 BC patients were studied. FDG-PET has been performed no later than 48 hours before surgery. Lymphoscintigraphy has been performed within 6 hours before surgery. After breast surgery, radio-guided biopsy of the SN has been performed. Axillary lymph node dissection (ALND) was performed if FDG-PET and/or SN were positive. Metastatic involvement of the SN and the other non-SN has been evaluated on definitive sections and represented the basis of the comparison between PET imaging and SN biopsy.

Results: Until now 71 patients have been studied. The average age was 55 years (range = 24–78). All patients had pT1 BC except 10 pT2 (size within 2.5 cm). The average histological tumor size was 15 mm (range = 2–25 mm). All lymph nodes detected by lymphoscintigraphy were in axillary region, and detection rate was 100%. All SN were identified with intra-operative gamma probe, and then biopsied. (If ALND was performed, 19 lymph nodes were removed, on the average.) 31 patients out of 71 showed nodal metastases (43%); 18/31 nodal involved patients had only one metastatic node (58%). The SN biopsy results showed 6 false-negative, whereas FDG-PET failed to detect 11 axillary nodal involvement (isolated tumoral cells, microembolic, or pluriembolic); only two patients with partial and massive nodal involvement was undetected by FDG-PET. Three false positive FDG-PET scan was registered.

Conclusions: These preliminary results suggest a different sensitivity between these methods, particularly for very small axillary involvement, whereas for metastases larger 2 mm, the two methods were comparable. However the clinical meaning of this minimal involvement is unclear, first to plan adjuvant treatment. A bio-pathologic profile of the tumors with minimal node involvement may help to better understand the right meaning.

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The prevalence of non-sentinel node metastases in patients with sentinel node micrometastases

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Background: The advantage of axillary clearance (AC) in patients with sentinel node (SN) micrometastases has been questioned. The aim of the study was to estimate the probability and risk factors of non-sentinel node (NSN) involvement in breast cancer patients with SN micrometastases.

Methods: Altogether 63 breast cancer patients with SN micrometastases and AC were included in the study. Both the SNs and NSNs were examined using serial sectioning and immunohistohemistry (IHC). The number of removed involved and uninvolved sentinel nodes, the size, the number and the detection method of the SN metastases, the histological type, the grade, the size and the stage of the tumour and the age of the patient were evaluated as possible risk factors for NSN involvement.

Results: The median number of harvested SNs was 2 (1–10) and the median total number of examined axillary nodes was 21 (8–30). The median number of tumour positive SNs was 1 (1–3). The SN metastasis was detected in frozen section in 28/63 (44%) patients and by IHC only in 23/63 (37%) patients. The median size of the SN metastasis was 0.4 mm (0.05–2 mm). NSN involvement was found in 13/63 (21%) patients with a median of 1 (1–10) NSN metastasis. The NSN metastases were larger than 2 mm in 6 patients.

NSN involvement was observed in 10/29 (34%) patients with metastatic findings in all removed SNs, and in 3/19 (16%) patients who had 1 or 2 uninvolved sentinel nodes removed in addition to the tumour positive ones. None of the 15 patients with 3 or more tumour negative SNs had NSN metastases.

NSN involvement could not excluded by other patient, tumour or sentinel node related factors. However, NSN involvement may be less common in connection with other histological tumour types than invasive ductal carcinoma, with grade I or II tumours, with histological stage I tumours, with metastases smaller than 1 mm or with micrometastases undetected in frozen section.

Conclusions: If axillary clearance is omitted in patients with SN micrometastases, more than 20% of the patients will have residual disease in the axilla, 10% even large metastases. However, the risk of NSN involvement seems negligible in patients with several healthy nodes removed in connection with sentinel node biopsy.

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Radioguided excision of nonpalpable breast cancer with simultaneous sentinel lymph node biopsy

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Methods and Results: From October 2000 to October 2003, 208 patients (211 breasts; three patients had synchronous bilateral NPBCs) underwent ROLL procedure with simultaneous SLNB. Injection of 30 MBq 30–80 or 200–600 nm particle sized colloid in 0.4 ml volume into the lesion under ultrasound or stereotactic guidance was performed in the afternoon prior to surgery. Lymphoscintigraphy (LS) was performed in the morning of the day of surgery. Patent blue dye (2 ml) was injected subareolarly before surgery. Gamma-probe was used for intraoperative localization of the NPBC and gamma-probe and/or blue dye for localization of the sentinel lymph node (SLN). The excision of the lesion was successfully performed in all breasts. SLNB was successful in 196 cases (93%). The SLN(s) were positive for metastases in 23 cases (12%). LS showed no axillary drainage in 30 cases (14%) but SLNs were identified by blue dye in 22 (73%) of these cases. LS showed parasternal lymphatic drainage in 34 cases (16%). Out of them 2 (1%) had exclusive parasternal drainage. Parasternal SLNB was performed in only one case (beside axillary SLNB) which was successful and both the axillary and parasternal SLNs were positive for metastases.

Conclusions: Image guided intralesional radiotracer administration is feasible for localizing NPBC and also allows simultaneous SLNB.