

Background

Lymph node status is the most important prognostic indicator in breast cancer in recently diagnosed primary lesion. The evidence of metastatic involvement in the axilla requires the indication of adjuvant therapy posterior to surgical tumor resection. There is not an accurate anatomical test for this purpose and clinical examination has inappropriate diagnostic values. Routine lymph node dissection is the only accepted method for therapeutic decisions but it is invasive and produces significant associated morbidity such as lymphedema and, eventually, infections. On the other hand, an important proportion of breast cancer patients are node-negative. Ultrasonography has also been reported as helpful, especially adding fine needle aspiration biopsy [1,2].

The role of nuclear techniques is controversial in the area related with breast cancer [3,4]. Positron emission tomography (PET) with fluorine deoxyglucose (FDG) is an excellent method for breast cancer evaluation even though is not easily available; it is used for diagnosis and surgical planning, staging and restaging of local regional recurrence or distant metastases and also for monitoring therapy response. Its value for detecting axillary involvement is somehow debated and it has not been used in routine practice in all centers, due to its current resolution for that purpose. However, it appears to be very helpful in internal mammary node evaluation [5-8].

Sentinel node detection with radioguided biopsy has a well defined role in early staging of breast cancer and small tumors. This technique allows the recognition of lymphatic spreading. It requires nodal histology to decide complete posterior lymphadenectomy. The strategy involves diverse methodologies, is technically challenging, and requires a learning curve [9-12].

Scintimammography is widely available and its diagnostic value in axillary detection is not optimal when using planar images with ^{99m}Tc -sestamibi or phosphonates. However, reports using single photon emission tomography (SPECT) images with sestamibi and tetrofosmine labeled with Tc^{99m} have better figures and even pinhole SPECT appears promising.

The aim of the present report was to evaluate through an unbiased standardized method the diagnostic value of planar sestamibi images for axillary involvement in breast cancer patients. This was accomplished in the scope of a multicenter interregional trial evaluating Tc^{99m} compounds for scintimammography in breast cancer evaluation [13,14].

Table 1: Breast tumor histology

Biopsy diagnosis	Number of cases
Ductal invasive carcinoma	123
Lobular invasive carcinoma	14
Colloidal carcinoma	5
Tubular carcinoma	3
Carcinoma <i>in situ</i>	3
Medullary carcinoma	1
Sarcoma	1
Total	150

Methods

Population

This prospective study included 149 female patients ranging from 29 to 82 years (mean \pm SD: 55.1 ± 11.9), from a multicenter trial on scintimammography Tc^{99m} radiopharmaceuticals co-ordinated by the International Atomic Energy Agency (IAEA). Sixty per cent were postmenopausal. All patients had confirmed breast carcinoma (one patient had bilateral lesions). Only 50 patients (33.3%) presented also with axillary palpable nodes.

Primary breast tumour histology is documented in Table 1.

The median size breast lesion was 25 mm ranging from 7 – 80 mm (mean \pm SD = 28.8 ± 13.9 mm).

Scintimammography was performed before the histopathological confirmation of the cancer. Cases with fine-needle aspiration as the only confirmatory procedure were excluded. Axillary lymph node dissection in 150 axillary beds was performed as a part of the standard staging.

All patients included in this group provided written informed consent according to their local institutions at participating centres (Chile, China, Colombia, Cuba, Greece, India, Peru, Turkey and Uruguay).

Tc-99m scintimammography protocol

The same protocol was used in all centres. The radiochemical purity of Tc^{99m} -MIBI was $\geq 95\%$. Patients were injected with a bolus of 740 -925 MBq of sestamibi into an antecubital vein in the contra-lateral arm to the breast lesion or in a pedal vein in the patient with bilateral lesions. A plastic cannula was used to avoid interstitial infiltration and the injection was followed by a saline flush.

The acquisition began 10 min post injection with the patient supine. Imaging parameters were: matrix 256×256 , peak energy of $140 \pm 10\%$ KeV, high-resolution low-