Technetium-99m-Sestamibi Prone Scintimammography to Detect Primary Breast Cancer and Axillary Lymph Node Involvement

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The purpose of this study was to evaluate prospectively the sensitivity and specificity of scintimammography in the detection of both primary breast cancer and axillary lymph node involvement. **Methods:** Sixty-five consecutive women referred for a suspicious breast lesion on clinical examination and/or with abnormal mammographies suggestive of malignancies were studied with scintimammography using planar prone imaging (with a chest positioning device with semicircular lateral aperture on the imaging table) performed 15 min postinjection of 25-30 mCi ^{99m}Tc-sestamibi. Three planar views, right and left lateral prone and anterior supine thoracic views, were obtained (8–10 min/view). The entire breast and ipsilateral axillary region were included in the field of view. Excisional breast biopsy and/or fine needle aspiration cytology were performed in all patients within 4 wk after scintimammography. Axillary node dissection was also performed. **Results:** The largest primary tumor measured 2 × 3 cm. There were 47 primary breast cancers (8 different histologic types) and 18 benign breast lesions (5 histologic types). The sensitivity of scintimammography for detecting primary breast cancer was 91.5% (43 true-positive, 4 false-negative) and the specificity was 94.4% (17 true-negative, 1 false-positive). Metastatic axillary lymph node involvement was seen in 19 of 41 patients. The sensitivity of scintimammography to detect metastatic lymph nodes was 84.2% (16 true-positive, 3 false-negative) and the specificity was 90.9% (20 true-positive, 2 false-positive). **Conclusion:** This preliminary study confirms the results of some previous reports, which showed the high diagnostic accuracy of scintimammography in detecting breast cancer. This study also shows the potential value of this procedure to detect axillary lymph node involvement as concomitant information.

Key Words: technetium-99m-sestamibi; scintimammography; breast cancer; axillary lymph node

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Breast carcinoma is the second most common cancer in North American women after lung cancer. Two years ago, breast cancer was estimated to occur in 180,000 new cases and to cause more than 46,000 deaths. Current statistics show that one in nine women in North America will develop breast cancer at some time during her life. To reduce the mortality associate with this disease, screening of asymptomatic women has been advocated to allow for diagnosis in an early stage with breast self-examination, regular breast physical examination by a physician and radiologic mammography on an annual basis after the age of 50 (*1–5*). Although different imaging techniques, such as ultrasound, PET and MRI have been used, mammography is the most effective method for detection of early, not clinically palpable breast cancer (*6–10*). Its extensive use has resulted in earlier diagnosis and up to 30% reduction in the relative risk of dying from breast cancer in women over the age of 50 (*11*).

Although mammography has a relatively high sensitivity of 80%–90%, especially in examination of fatty breasts of older women, it is less reliable for detecting lesions in dysplastic or dense breasts (*12–13*). Some studies have reported a false-negative rate varying from 25% to 45% for mammography (*9,14*). The major drawback of mammography is its low specificity and low positive predictive value of only 10%–35% for nonpalpable cancers. Mammography cannot always be used to accurately differentiate benign from malignant lesions (*8,15,16*). Consequently, most mammography-directed surgical breast biopsies are benign. The frequency of positive biopsy findings after an abnormal mammogram ranges from 10% to 50% (*17–20*). In the event that a localized abnormality suggestive of malignant disease is suspected on mammography, most patients will have a short-interval follow-up mammogram, fine-needle aspiration cytology or surgical excision. Although fine-needle aspiration and stereotactic core biopsy are less invasive than excisional biopsies, they can be inadequate for early cancer detection and may have sampling errors (*21,22*). On the other hand, excisional biopsies expose patients to morbidity, risk and costs associated with surgical procedures.

Since axillary lymph node involvement is an important prognostic factor, almost every patient with invasive breast cancer will undergo an axillary dissection. This surgical procedure also has a non-negligible morbidity. There is certainly a need for reliable noninvasive diagnostic tech-

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niques that can: discriminate between benign and malignant breast masses, detect axillary lymph node metastasis in clinically negative nodes and confirm clinically positive nodes. Such techniques would be useful complements to existing diagnostic procedures and could help eliminate many unnecessary biopsies and axillary dissections.

Breast cancer detection has been evaluated using several radionuclide imaging techniques with different radiopharmaceuticals such as: 2-[^{18}F]-fluoro-2-deoxy-D-glucose (FDG); 21-[^{18}F]-fluoro-16 alpha-ethyl-19-norprogesterone, 16 beta-[^{18}F]fluoromoxestrol; ^{11}C-methionine; E-17 alpha-[^{131}I]iodo-vinylestradiol, several ^{111}In, ^{123}I or ^{99m}Tc-labeled monoclonal antibodies; radiolabeled tamoxifen analogues, ^{111}In-octreotide; ^{99m}Tc-sulfur colloid; [^{99m}Tc]pertechnetate; ^{99m}Tc-dextran; ^{99m}Tc-MDP; ^{67}G-citrate; ^{201}Tl; and, more recently, ^{99m}Tc-sestamibi (*23–52*). Sestamibi is used extensively as a myocardial perfusion imaging agent, but its efficacy in imaging various tumors has been studied (*53–62*). Recent data suggest a promising clinical role for ^{99m}Tc-sestamibi scintimammography (*63–65*).

The purpose of this study was to evaluate the sensitivity and the specificity of ^{99m}Tc-sestamibi scintimammography in the detection of breast cancer and axillary lymph node involvement.

MATERIALS AND METHODS

Patients

Sixty-five consecutive women (mean age 56 ± 13 yr; mean weight 64 ± 15 kg; mean height 160 ± 25 cm) referred to the breast cancer clinic of our institution were prospectively enrolled in this study. Before inclusion in the study, each patient had a physical breast examination by one of the three experienced breast surgeons of the clinic and one radiological mammogram. Patients with either a clinically palpable mass or a suspicious mammographic finding that required fine needle aspiration cytology or breast biopsy were then referred for ^{99m}Tc-sestamibi scintimammography. All patients with a nonpalpable mass had stereotactic core localization prior to surgical biopsy. All patients gave informed written consent as part of the research protocol approved by our hospital's Institutional Review Board for Human Experimentation.

There were 44 palpable lesions and 21 nonpalpable lesions. A recurrent malignant breast tumor was suspected in four patients who had been previously treated for this disease, and three patients had bilateral mammary prosthesis at the time of the study. Fine needle aspiration cytology was performed in 42 patients. Final diagnostic results (histopathology) were obtained by excisional biopsy in 54 patients and by fine needle aspiration cytology in the remaining 11 patients. Axillary dissection was performed in 41 patients. The smallest tumor size (except for a microscopic in situ cancer), as measured by the pathologist, was 0.6 × 0.3 cm; the largest tumor was 3 × 2 cm. The mean time interval between the ^{99m}Tc-sestamibi study and breast biopsy and/or fine needle aspiration cytology was 11 ± 8 days. Breast biopsy was performed within 4 wk of scintimammography in all patients but two (36 and 42 days, respectively).

Conventional Mammography

Conventional radiological mammography was performed in the craniocaudal and mediolateral oblique projections using a dedicated mammography unit. All mammograms were interpreted by the same experienced radiologist with knowledge of the patient's history, clinical presentation, physical examination and the results of any previous mammograms.

Technetium-99m-Sestamibi Scintimammography

All patients had the same ^{99m}Tc-sestamibi breast imaging protocol, there was no specific patient preparation. Sestamibi was labeled as previously reported (*66*) and its labeling efficiency was always more than 95%. Patients were injected with 25–30 mCi (900–1100 MBq) according to their respective body weight. The injection was given as a bolus into an antecubital vein (through a plastic cannula) in the arm on the opposite side of the known breast lesion to avoid any false-positive uptake in the axillary lymph nodes. For patients with suspected lesions in both breasts, the injection was given in a pedal vein. The syringe containing the radioactivity was then flushed with 10 cc of normal saline solution.

Technetium-99m-sestamibi scintimammography was performed using a rectangular single-detector gamma camera with a parallel-hole, high-resolution collimator interfaced to a computer. The energy peak was centered at 140 keV with a 10% window. Planar images (three views) were obtained 10–15 min postinjection. A preset data acquisition time (8–10 min/view) was performed for each view. The first two images (right and left lateral thoracic views) were obtained while the patient laid prone on a special breast positioning device installed over the imaging table. The device consists of a foam cushion with a lateral semicircular aperture in which the breast was carefully positioned by an experienced technologist before imaging. The cushion allows the breast to be pending and minimizes the distance between the breast and the detector. Three different cushions were used, depending on the patient's breast size. The opposite breast is not seen and imaging the pending breast while the patient is prone provides optimal separation of the thoracic and abdominal organs, particularly the myocardium and liver in the lateral projection. Special care was taken to position the patient so that ipsilateral axilla was clearly included in the field of view. The breast was centered in the field of view, which extended from the neck to the upper level of the abdomen.

A third image, an anterior thoracic view including both axillae with the patient supine, was obtained after the initial lateral views of both breasts. When possible, the arms were raised and the hands placed behind the patient's head. This projection was used mainly to locate the primary tumor, especially those in the inner breast quadrants, and to visualize axillae. The entire imaging procedure took approximately 40 min and all images were recorded on a computer.

Data Analysis

All scintimammograms were analyzed by two independent, experienced nuclear medicine physicians who were blinded to the clinical status, physical examination, radiologic mammogram and histopathologic results. Disagreements were resolved by consensus, with a third observer used as a referee. Readers were asked to determine if the study was positive or negative for a primary malignant breast tumor and whether axillary lymph nodes were involved. A positive study for a malignant breast tumor was defined as a focalized area of increased uptake compared to the surrounding normal breast tissue (Figs. 1–5). Two types of display were available: hard copy of the analog film and direct reading on the computer screen with adjustments for contrast. The latter display was particularly useful for detecting small lesions or those in the axilla. Semiquantitative analysis also was used to determine

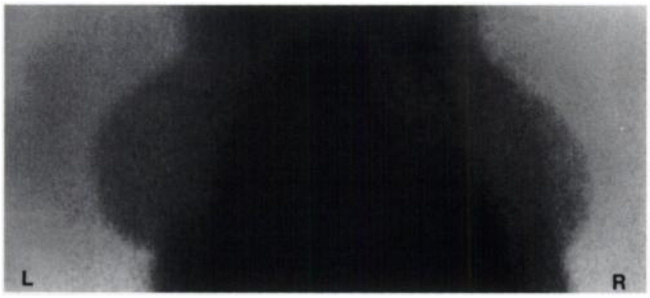

FIGURE 1. Normal prone scintimammogram obtained 15 min postinjection of 25 mCi ^{99m}Tc-sestamibi. Planar imaging was performed in the left (L) and right (R) lateral thoracic projections. Radiotracer distribution is homogeneous throughout the breast tissue and there is no abnormal uptake in the axilla.

FIGURE 3. Scintimammographic study of the left breast in a patient with fibrocystic disease. There is diffuse and slightly increased uptake of ^{99m}Tc-sestamibi throughout the breast without any focalized uptake suggestive of malignant abnormality.

the relative degree of diagnostic certainty: 0 = definitely normal, 1 = probably normal, 2 = equivocal, 3 = probably abnormal, and 4 = definitely abnormal.

In a second step, regions of interest were placed over the primary breast tumor, surrounding normal breast tissue, axillary lymph nodes (if detected on the ^{99m}Tc-sestamibi study) and ipsilateral lung to determine four activity ratios: breast tumor to normal breast tissue, breast tumor to axillary lymph nodes, normal breast tissue to lung and axillary lymph nodes to lung.

Statistical Analysis

Data are expressed as mean ± 1 s.d. Sensitivity is defined as the number of true-positive cases divided by the sum of the true-positive plus the false-negative studies. Specificity is the number of true-negative divided by the sum of true-negative plus false-positive studies. Positive and negative predictive values are defined as the number of true-positive cases divided by the sum of true-positive plus false-positive and the number of true-negative divided by the sum of true-negative plus false-negative cases, respectively.

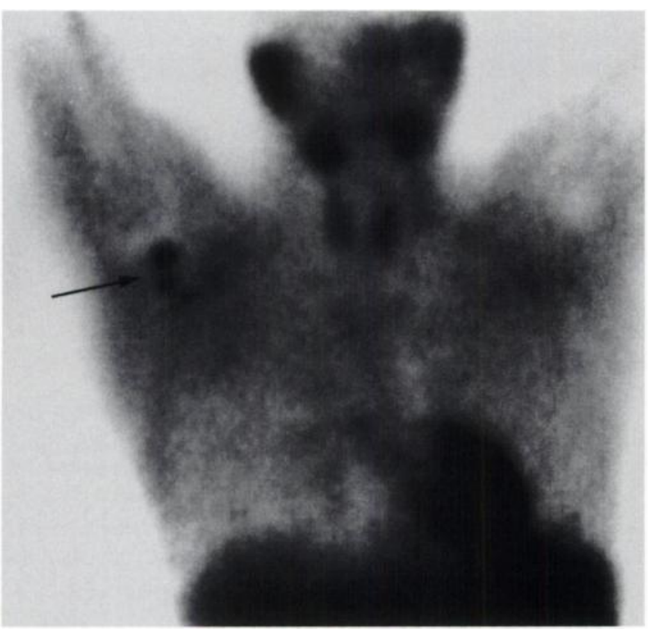

FIGURE 2. Anterior thoracic view obtained 30 min postinjection of 25 mCi ^{99m}Tc-sestamibi in the right antecubital vein. Three right axillary lymph nodes were clearly visualized (arrow). Nonspecific nodal uptake was related to lymphatic uptake of ^{99m}Tc-sestamibi, secondary to some degree of radiotracer extravasation at the site of venipuncture.

RESULTS

Breast Lesions

Table 1 summarizes the ^{99m}Tc-sestamibi scintimammography results for detecting suspicious breast lesions using histopathologic diagnosis as the gold standard. There were 47 primary breast cancers (8 different histologic types) and 18 benign breast lesions (5 different histologic diagnosis). The sensitivity of ^{99m}Tc-sestamibi for detecting primary breast cancer was 91.5% (43 true-positive and 4 false-negative); the specificity was 94.4% (17 true-negative and 1 false-positive).

One false-positive scintigraphic study was observed in a patient with fibrocystic disease. Although ^{99m}Tc-sestamibi uptake in this study was slightly more diffused and less focalized than for usual breast cancers, the relative uptake was judged significant enough to be positive for cancer. The diagnostic certainty in this particular case was grade 2 (equivocal), but for the overall study, it was considered as abnormal.

Four studies had false-negative findings based on pathologic results from biopsied specimens. One patient had a microscopic ductal carcinoma in situ (small cluster of microcalcifications without an associated mass). Infiltrating ductal carcinomas of relatively small size (0.6 × 0.5 × 0.5 cm, 0.6 × 0.4 × 0.3 cm and 0.7 × 0.5 cm) were found in three other patients. Two of these patients had a nonpalpable mass.

Based on our diagnostic certainty gradation, 42 of the 43 true-positive cases were classified as definitely abnormal, whereas 1 was viewed as probably abnormal. Fifteen of the 17 true-negative cases were definitely normal and 2 were probably normal.

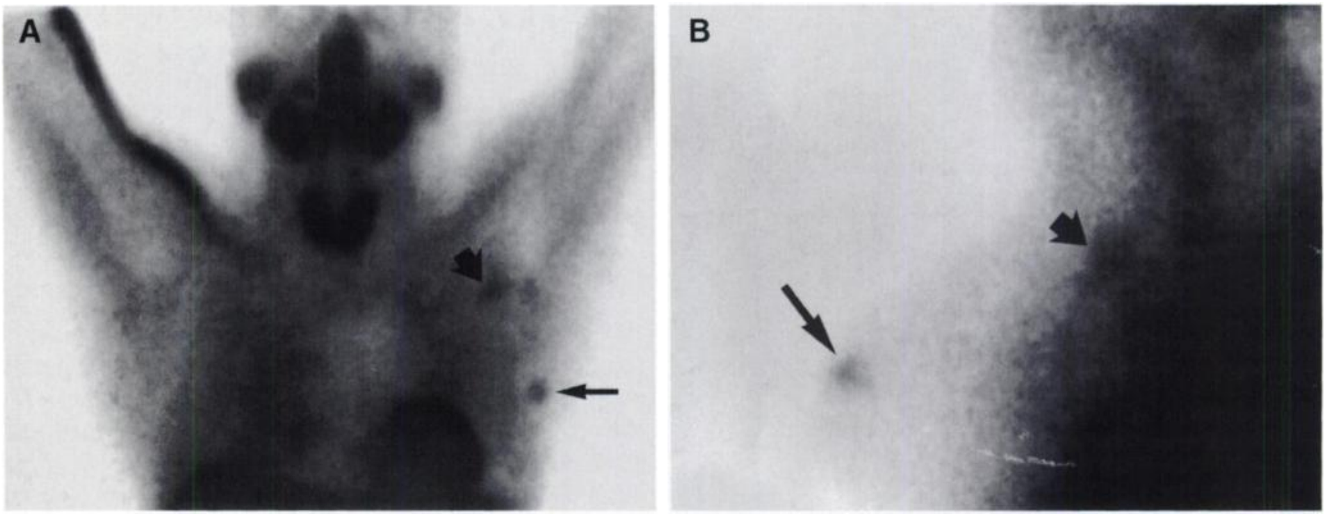

FIGURE 4. (A) Anterior and (B) left lateral views of a patient with infiltrating ductal carcinoma of the left breast measuring 1.6 × 1.4 × 1.1 cm. Metastatic involvement was found in five of nine axillary lymph nodes. Scintimammography correctly detected the primary cancer (arrow) and the axillary metastases (arrowhead).

Axillary Nodes

Axillary node dissection was performed in 41 patients. Histopathologic examination revealed metastatic node involvement in 19. A total of 405 nodes were removed and 77 showed metastatic disease. Technetium-99m-sestamibi imaging had a sensitivity of 84.2% for detecting metastatic axillary lymphatic nodes (16 true-positive and 3 false-negative results). For the three patients with false-negative results, positive lymph nodes were seen in two of nine, one of fourteen, and in two (micronidus) of seven axillary lymph nodes, respectively.

The specificity of ^{99m}Tc-sestamibi to exclude metastatic lymph node involvement was 90.9% (20 true-negative and 2 false-positive results). For one patient with a false-positive scintigraphic study, sarcoidosic lymphadenitis was discovered in 1 of 10 nodes, while a nonspecific chronic inflammatory reaction was diagnosed in another patient. The positive and negative predictive values were 88.9% and 86.9%, respectively (Table 2).

Our diagnostic certainty evaluation identified 12 of 16 true-positive cases as definitely abnormal and 4 as probably abnormal. Seventeen of the 20 true-negative cases were

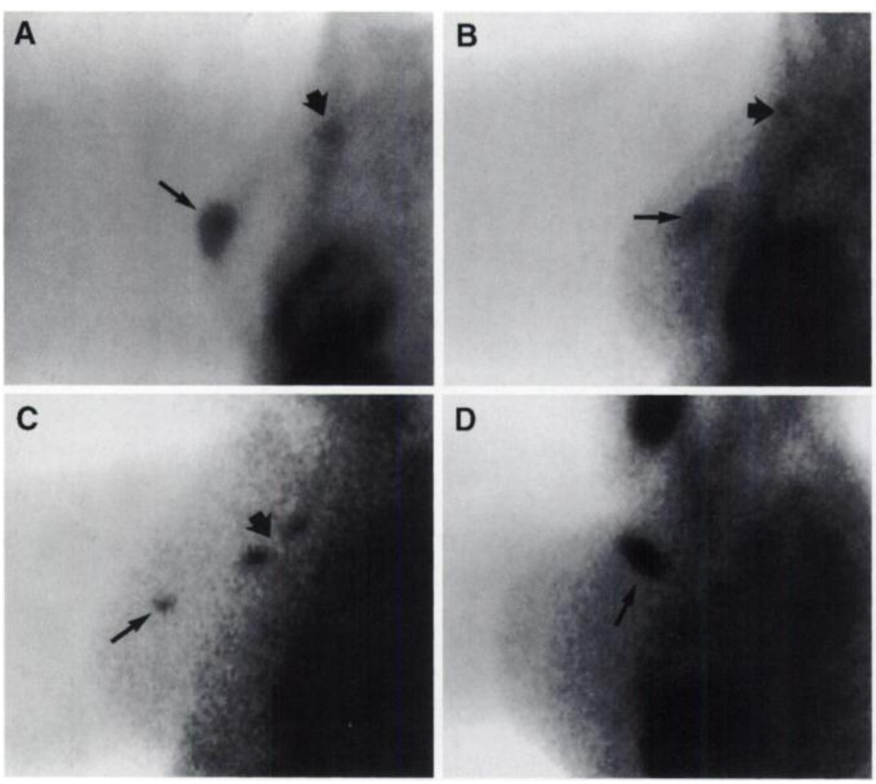

FIGURE 5. Technetium-99m-sestamibi scintimammograms from four different patients with primary breast tumor (arrows) and metastatic axillary lymph node involvement (arrowheads). (A) Patient with an infiltrating ductal carcinoma, axillary involvement and breast prosthesis. (B) Mixed ductal and lobular infiltrating lobular carcinoma measuring 1.6 × 1.7 cm and axillary metastasis in a patient with a normal mammography. (C) Infiltrating ductal carcinoma (1.5 × 1.5 cm) and axillary metastasis. (D) Malignant follicular lymphoma (2.0 × 2.0 × 2.0 cm) of the left breast.

TABLE 1
Technetium-99m-Sestamibi Scintimammography Results and Histopathologic Correlations

True-positive cases (n = 43)
34 infiltrating ductal carcinoma
2 infiltrating lobular carcinomas
2 tubular carcinomas
2 lymphomas
1 mixed ductal and lobular carcinomas
1 medullary carcinoma
1 cribriform carcinoma
True-negative cases (n = 17)
9 fibrocystic disease
4 fibroadenomas
2 cysts
1 normal breast tissue
1 siliconoma
False-positive case (n = 1)
1 fibrocystic disease
False-negative cases (n = 4)
3 infiltrating ductal carcinoma
A: 0.6 × 0.5 × 0.5 cm
B: 0.6 × 0.4 × 0.3 cm
C: 0.7 × 0.5 cm
1 microscopic ductal carcinoma (in situ, no infiltration)

evaluated as definitely normal and the remaining 3 were probably normal. Of the 19 patients with metastatic axillary lymph node involvement, 7 patients had negative physical examination results of the axillary cavity. Four of the 22 patients without metastatic involvement had false-positive physical exams.

Semiquantitative Analysis (Activity Ratios)

Four different activity ratios were determined in 61 patients for whom all computerized data were available and complete: Primary breast tumor-to-normal breast tissue was 2.2 ± 0.7 (from 1.2 to 3.7); breast tumor-to-positive axillary nodes was 0.7 ± 0.2 (from 0.3 to 1.1); normal breast-to-lung was 0.3 ± 0.1 (from 0.1 to 0.6); and axillary nodes-to-lung was 0.8 ± 0.3 (from 0.6 to 1.5).

DISCUSSION

Several radionuclide imaging approaches have been reported or are currently undergoing animal or human studies for detecting breast cancer and differentiating benign and malignant breast masses. Presently, three of these techniques have been more extensively applied in humans: [^{18}F]FDG with PET, ^{201}Tl and ^{99m}Tc-sestamibi breast imaging. Although the sensitivity and specificity of [^{18}F]FDG PET have been reported to be as high as 100% and 85%, respectively, clinical experience with this modality is limited. Furthermore, cost and availability of PET prevent its widespread clinical application.

Breast imaging with ^{201}Tl-chloride was first reported in 1978 (*67*). Other studies have been reported since then. A recent study by Waxman et al. (*50*) found that ^{201}Tl breast scintigraphy had a sensitivity of 96% in 81 patients with palpable breast masses and 30 patients with no palpable abnormalities. Three highly cellular benign adenomas were detected; the smallest detectable cancer measured 1.3 × 1.1 × 0.9 cm. Waxman et al. also imaged patients while they were supine. Unfortunately, ^{201}Tl is not an optimal imaging agent for tumor detection because its physical characteristics are not ideal for modern gamma cameras and there is washout and redistribution in tumors.

Because of the more favorable emission characteristics of ^{99m}Tc and its myocardial biodistribution proportional to the blood flow, ^{99m}Tc-sestamibi is a good alternative to ^{201}Tl for tumor detection. Tumor imaging with ^{99m}Tc-sestamibi was reported in 1987 (*68*). Subsequent studies focused on sestamibi imaging of various cancers such as lung carcinoma, osteosarcoma, brain tumors as well as benign tumors such as thyroid or parathyroid adenomas. Although the exact mechanism of ^{99m}Tc-sestamibi cellular uptake by cancer cells is not really known, experimental culture cell studies demonstrated that ^{99m}Tc-sestamibi has good characteristics for in vivo tumor imaging (*69–71*). Recent data (*72*) using ^{99m}Tc-sestamibi imaging in the c-neu OncoMouse™ (transgenic mouse that spontaneously develops mammary tumors) showed that tumor retention of ^{99m}Tc-sestamibi was highest at the periphery of the tumor, with an uptake of 0.94% ± 0.54% ID/g of tissue, while the center of the tumor (often acellular and filled with blood or necrotic debris) showed less retention. These data support the use of ^{99m}Tc-sestamibi as a marker of viable tumor tissue. It is likely that many factors are simultaneously involved in sestamibi tumor uptake, including the biochemical characteristics of ^{99m}Tc-sestamibi (its cationic charge and its lipophilicity), the degree of local blood flow, transcapillary exchange, interstitial transport and the negative intracellular charge of both mitochondria and cell membranes. It is known that ^{99m}Tc-sestamibi is taken up by the mitochondria using some form of active transport but it is passively transferred across the cell membrane.

We found that ^{99m}Tc-sestamibi scintimammography has a high sensitivity (91.5%) and specificity (94.4%) for detecting primary breast cancer, with positive and negative predictive values of 97.7% and 81%, respectively. These results are comparable to those reported by Khalkhali et al. (*63*). As did we, Khalkhali et al. used prone breast imaging with a plastic table overlay to obtain lateral views 5 min to

TABLE 2
Specificity and Sensitivity Technetium-99m-Sestamibi Scintimammography in Detecting Breast Cancers and Axillary Node Involvement

Parameter	Breast cancer	Axillary nodes
Sensitivity	91.5% (43/47)	84.2% (16/19)
Specificity	94.4% (17/18)	90.9% (20/22)
Positive predictive value	97.7% (43/44)	88.9% (16/18)
Negative predictive value	81.0% (17/20)	86.9% (20/23)

The values in parentheses are the number of patients with abnormal or normal lobes.

1 hr after injection of 20 mCi sestamibi. A final anterior thoracic image was obtained in the upright position to visualize the axillae. They found a sensitivity of 95.8%, specificity of 86.8% and positive and negative predictive values of 82.1% and 97.1%, respectively. The higher incidence of false-positive cases in their study explains the lower specificity and positive predictive value. They had five false-positive cases, two patients with fibroadenomas and three with fibrocystic disease, while we had only one false-positive case, a patient with fibrocystic disease.

One major difference between the two studies is that we correlated the pathologic and scintigraphic results in detecting concomitant axillary lymph node involvement. Because knowledge of axillary node involvement is clinically important and because both breast tissue and axilla can be included simultaneously in the same field of view, it is certainly relevant to obtain scintigraphic information of both regions. In our patient sample, ^{99m}Tc-sestamibi scintimammography had a sensitivity of 84.2% and a specificity of 90.9% in detecting axillary metastasis from breast cancer. The positive predictive value is 88.9% and the negative predictive value is 86.9%. These results are similar to those reported by Waxman et al. (*73*), who studied a smaller number of patients (13 patients had an axillary dissection) and found a sensitivity and specificity of 79% and 80%, respectively, for axillary metastasis detection.

As with any other diagnostic procedure, technical considerations for ^{99m}Tc-sestamibi scintimammography are crucial to obtain satisfactory results. Intravenous administration of 25–30 mCi ^{99m}Tc-sestamibi, in addition to a relatively lengthy acquisition time (8–10 min/view), will provide images with high count density. The chest positioning device is also of prime importance so that the imaged breast is close to the detector surface and the patient is positioned as comfortably as possible.

At the beginning of this study, we obtained supine and upright lateral views, but the diagnostic quality of the images was so questionable that we decided to use only lateral breast imaging performed with the patient prone. With prone imaging, the breast contours are well delineated (providing a good anatomical reference for localization of the lesions) and there is excellent separation of deep breast structures from the thoracic or abdominal organs. Small, deeply localized lesions can be more easily detected in this projection. We also found that direct reading from the computer screen with correct adjustments for contrast are important, particularly for small lesions with relatively low sestamibi uptake or axillae evaluation.

Given sestamibi's favorable imaging characteristics, would SPECT imaging be appropriate for breast tumor detection? Although SPECT imaging can provide better contrast resolution, accurate localization of the lesion can be sometimes more difficult to obtain. Furthermore, Nagaraj et al. (*74*) compared planar and SPECT ^{99m}Tc-sestamibi scintimammography in 34 patients, and found that the sensitivity for detecting breast cancer or axillary abnormalities was similar for planar and SPECT imaging, but specificity was decreased with SPECT compared to planar acquisition: 70% for planar versus 50% for SPECT in detecting breast cancer and 100% for planar versus 75% for SPECT for detecting axillary node involvement. Of course, more data from a larger patient population are needed to confirm these numbers. At this time, we prefer planar imaging.

Technetium-99m-sestamibi scintimammography could potentially be useful in the evaluation of breast cancer in four ways:

1. It could be useful in the evaluation of clinically suspicious breast masses without mammographic abnormality (especially in young women with dense breast tissue).
2. Sestamibi scintimammography along with stereotactic fine needle aspiration cytology or core-biopsy could decrease the biopsy per cancer ratio in mammographic abnormalities.
3. It can potentially determine breast recurrence after segmental mastectomy for invasive breast cancer (as detected in this study in four patients with recurrent disease).
4. It can detect metastases in the axillary lymph nodes.

In fact, this later indication may be one of the greatest utility of this new procedure. Presently, axillary lymph node status is determined either clinically or pathologically. The clinical evaluation of lymph node status, however, is frequently inaccurate. Among patients with clinically negative axillary lymph nodes, up to 39% may have histologically positive nodes. Conversely, among patients with clinically palpable lymph nodes thought to be positive, 38% would not have lymph node metastases on histologic review (*75*).

Axillary dissection provides important staging and prognostic information and identifies subgroups of patients for the selection and evaluation of adjuvant chemotherapeutic regimens. In patients with clinically negative nodes, axillary dissection will prevent recurrent disease if the nodes are involved histologically but does not confer a survival advantage. Therefore, ^{99m}Tc-sestamibi scintimammography could be useful in the selection of patients for axillary dissection in both clinically negative and suspicious lymph nodes and, by doing so, may help to decrease the number of short-term and long-term complications associated with axillary dissection. Sensitivity and specificity results are not sufficient at this time to eliminate surgical dissection and further research is needed.

CONCLUSION

This preliminary study confirms the results of some previous reports demonstrating the high diagnostic accuracy of ^{99m}Tc-sestamibi scintimammography in detecting breast cancer. Furthermore, this study also shows the potential value of this procedure in detecting axillary lymph node involvement as concomitant data. Although further studies are needed to evaluate and confirm our impressions and those of others, we believe that ^{99m}Tc-sestamibi scintimammography has a promising clinical future and may play a significant clinical role in complementing conventional mammography for detecting breast cancer and axillary lymph node involvement.

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