

Detection of Invasive Lobular Carcinoma using a High-Resolution Breast-Specific Gamma Camera

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BACKGROUND

Mammography is the mainstay for breast cancer screening. However, it is an imperfect examination with 10-15 % of breast cancers not mammographically visible (1). Therefore adjunct imaging modalities are being developed to improve diagnosis. Mammography and ultrasound, the mainstays of breast cancer imaging, are anatomic approaches to cancer diagnosis. However, Molecular Breast Imaging or Breast Specific Gamma Imaging using a high resolution, breast specific gamma camera (BSGI) is a physiologic approach to breast cancer diagnosis. BSGI utilizes a radiotracer and images breast cancer by its increased metabolic activity and blood flow. Recently BSGI has been shown to be a powerful and important modality for improving cancer diagnosis in a high-risk screening population with normal mammograms and physical examination (2).

The specific pathologic type of cancer can affect whether a radiologist may miss a cancer on a mammogram. Specifically, invasive lobular carcinoma is more apt to be missed on a mammogram (3). Therefore, it is important to assess whether BSGI is an effective imaging modality in detection of the more difficult to diagnose cancers.

PURPOSE

The purpose of this study is to evaluate the ability of BSGI utilizing a high-resolution, breast specific gamma to detect invasive lobular carcinoma.

MATERIALS AND METHODS

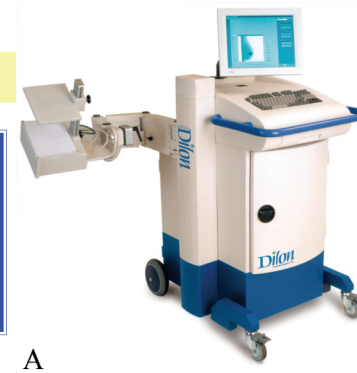
117 women over age 18 who were not pregnant were included in this study. All women had breast lesions warranting biopsy (BIRADS 4 or 5) detected by mammography or ultrasound. Patients underwent BSGI using 25-30 mCi of Technetium 99m sestamibi with a high resolution, small field-of-view, breast-specific gamma camera (Dilon 6800, Dilon Technologies, Newport News, VA) in the cranio-caudal and mediolateral oblique views. The acquisition time for each image was less than 10 minutes. BSGI images were prospectively classified using a 1-5 scale: 1) normal; 2) benign with minimal patchy physiological uptake; 3) probably benign with scattered patchy uptake; 4) probably abnormal, with mild focal radiotracer uptake; and 5) abnormal with marked focal radiotracer uptake.

RESULTS

Of the 117 women, 5 (4.3%) had lesions that on pathology were found to be pure invasive lobular carcinoma. Mean size of the ILC was 22.1 mm (range 1.5-60 mm). All 5 lesions (100%) had BSGI studies that were classified as 4 or 5, that is, positive in the same quadrant of the breast and the same distance from the nipple in which the cancer was detected. There were no false negative studies in women with ILC.

CONCLUSIONS

BSGI is a highly sensitive imaging modality in detecting Invasive Lobular Carcinoma, a cancer which is often difficult to detect mammographically, with ultrasound or on physical examination. Additional, larger studies are being undertaken to further evaluate BSGI in the diagnosis of invasive lobular carcinoma.



A

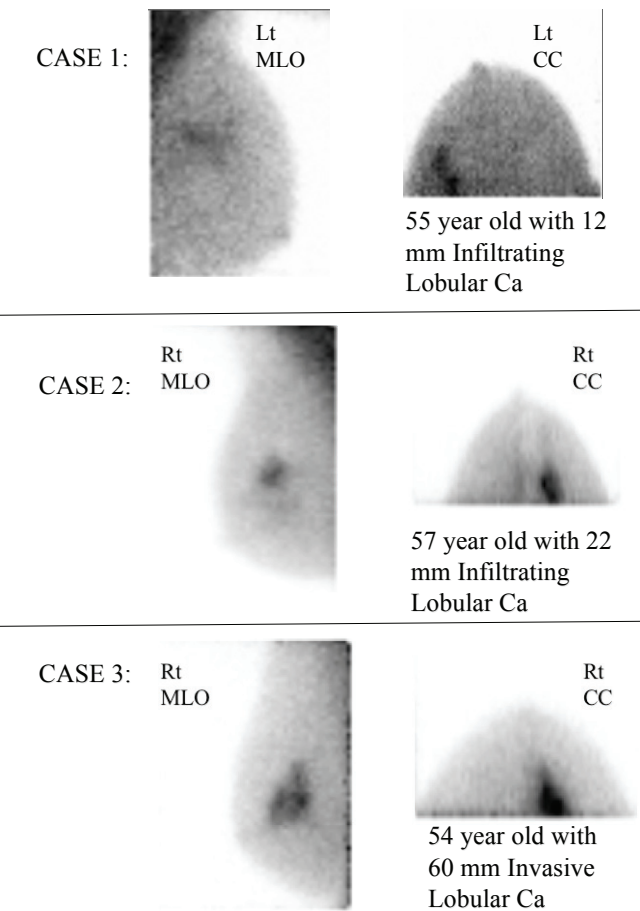


B



C

The Dilon 6800: High Resolution Breast-Specific Gamma Camera:
A: The Camera
B: Patient imaged in the medio-lateral oblique projection
C: Patient imaged in the cranio-caudal projection



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