Automated Breast Ultrasound Clarifies Diagnosis of Subareolar Mass in Dense Breast

Introduction

Since mammography may miss up to one-third of breast cancers in women with dense breasts,[1] many radiology departments in the United States are using supplementary imaging tools to help them detect breast cancers earlier and with more clarity. When cancers are diagnosed early, doctors can prescribe less invasive treatments and/or shorten the length of treatment.

Dr. Stuart Souders is an experienced breast radiologist in California who recommends Invenia™ Automated Breast Ultrasound (ABUS) to his patients with dense breasts as an adjunct screening exam with mammography. Since ABUS screens breasts in an automated fashion, it provides consistent, reproducible images regardless of who is operating the machine. Furthermore, in a diagnostic setting, these images can provide a road map for evaluation of additional suspicious areas that may require targeted hand-held ultrasound in addition to any obvious palpable abnormality.

In the following case, ABUS was able to characterize a mass that was not seen, even in retrospect, in a routine 2D screening mammogram. Ten months later, it was detected in a diagnostic work-up performed after the patient felt a lump in her left breast.

"With ABUS, everything is on the images. Hand-held screening ultrasound can take 20 to 30 minutes of a technologist's and/or radiologist's time to perform. If a lesion is not found by the person doing the scanning, it will not be recorded in the image file. Whereas, regardless of who performs ABUS, the entire breast is captured by the ABUS data set and the data can be analyzed by any physician, even after the patient has left. Thus, ABUS is more comprehensive and reproducible."

Case Study

Presentation

A 65-year-old woman with no prior history of cancer had her annual 2D screening mammogram in May 2015. Her results were negative and showed no change from 2014. Because her current assessment showed extremely dense breast tissue (Category D), she was offered ABUS, but she declined. Several weeks later, she noticed a lump near her left nipple. Due to a planned trip, she ignored the lump hoping it would go away.
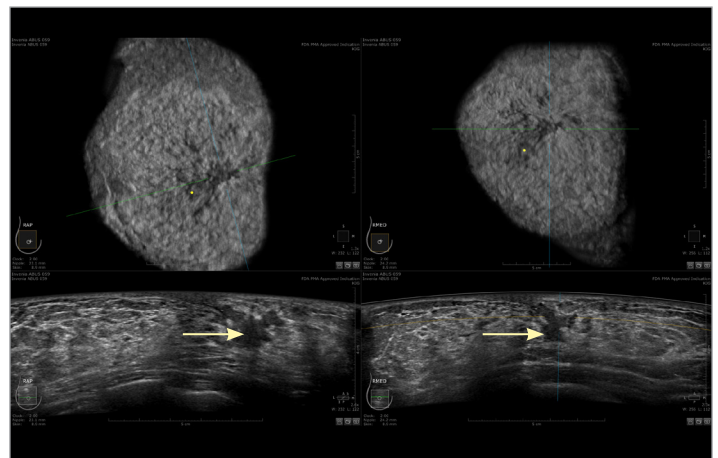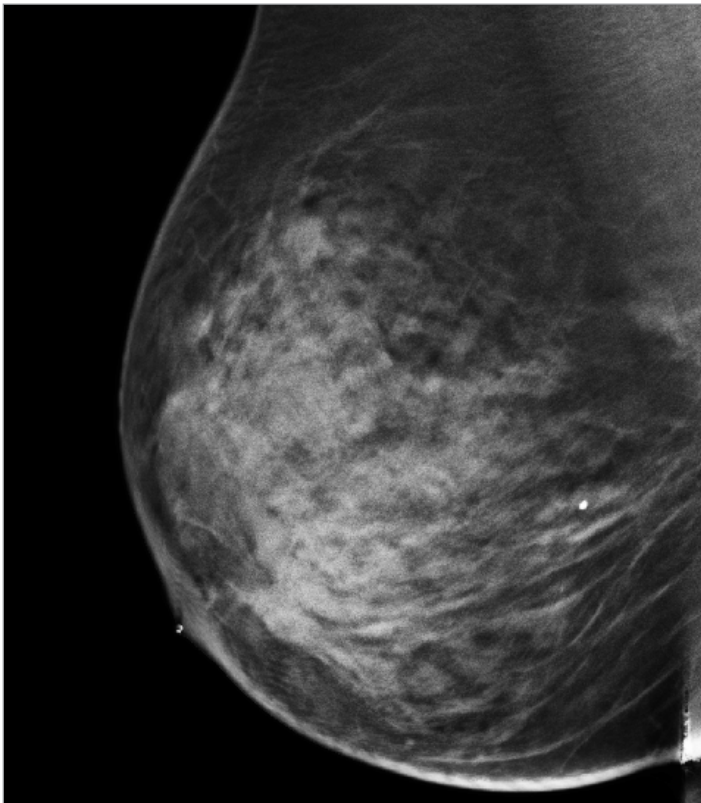

Multi-volume images of the right anterior-posterior, and the right medial views, clearly defining the biopsy proven low grade Invasive Lobular Carcinoma with ductal features seen extending toward the nipple.

Investigation

It was not until February 2016 that the patient scheduled a physical exam to check on the lump, which she believed had grown. Her nurse practitioner ordered a diagnostic work-up.

Dr. Stuart Souders performed 3D tomosynthesis as a first step in evaluating the palpable mass. The initial impression on the 3D tomo study was that there were no significant abnormalities. However, this was a symptomatic patient. This was not a screening exam. So, very careful scrutiny was given to the area of concern. On a single tomo slice in the MLO projection, a subtle focus of architectural distortion was suggested.

Dr. Souders did both ABUS and HH-US in the same visit, saving the patient the possibility of being called back for a second ultrasound if ABUS detected multi-centricity. This case gave Dr. Souders the opportunity to use and compare 3D tomosynthesis and ABUS capabilities in a patient with extremely dense breast tissue.

3D Tomosynthesis view of the palpable mass – Only vague area of distortion.

Right medial view of the palpable mass, proven to be low grade Invasive Lobular Carcinoma.

Because there was a palpable mass, an ultrasound was scheduled immediately after the 3D exam. Prior to the targeted US to characterize the palpable findings, Dr. Souders routinely also does an ABUS if the patient has dense breasts. This enables him to detect any other areas that might need targeted characterization and therefore potentially avoid an additional study. He incorporates both studies as one exam.

ABUS dramatically confirmed the subtle findings on 3D mammogram and suggested the palpable mass was very suspicious. No other suspicious ABUS findings were noted in either breast. A targeted HH-US was then used to further delineate and characterize the mass as highly suspicious. A biopsy was performed later that same day and was positive.

Diagnosis

The differences in the images were dramatic. ABUS indicated a clear 1.5 cm mass versus a vague distortion seen on the 3D tomosyntheisis image. No multi-centricity or multi-focality was noted. The targeted HH-US combined with MRI again confirmed the ABUS findings. MRI showed cancer at 2 o'clock in the retroareolar region.

Pathology from a HH-US biopsy demonstrated a 1.9 cm low grade Invasive Lobular Carcinoma with some ductal features that was estrogen and progesterone positive and HER2-negative.

Treatment

The patient was treated with a simple, nipple-sparing lumpectomy that had clear margins. She had intra-operative radiation followed by three weeks of external beam radiation. She had no metastasis and is on a five-year course of Letrozole.™

Discussion

Dr. Souders is particularly excited about what ABUS did for his patient and how it can continue to provide early breast cancer detection for all his patients with dense breasts:

"ABUS demonstrated this cancer beautifully. While the cancerous mass was mammographically occult on her screening mammogram in May 2015, I believe it was most likely present. If the patient had an ABUS at that time, this lesion could have been detected earlier, her treatment would have been less invasive and her prognosis improved.

Comparing ABUS to 3D tomosynthesis suggests that ABUS is a superior diagnostic tool in the very dense breast, which is what has been reported by other radiologists."

Dr. Stuart Souders

Dr. Souders is a board-certified radiologist who has been practicing for over 30 years in Southern California. He earned his medical degree at the University of Nebraska College of Medicine, did his residency at Duke University Medical Center and a fellowship at University of Southern California – LAC & USC Medical Center. He is currently affiliated with Northern Inyo Hospital in Bishop, California.
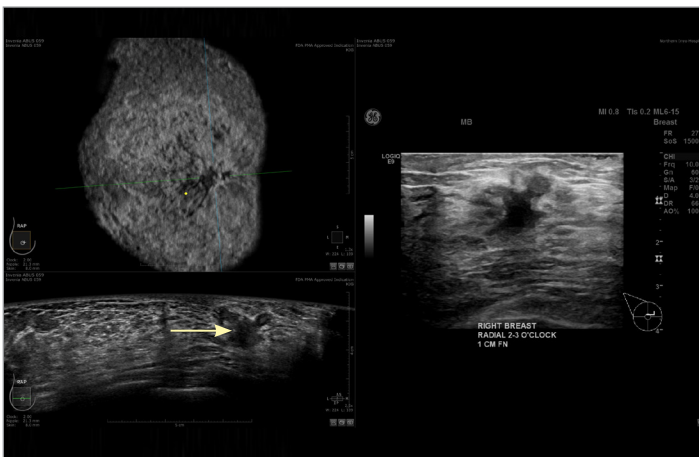
Biopsy proven low grade Invasive Lobular Carcinoma with corresponding hand-held ultrasound.
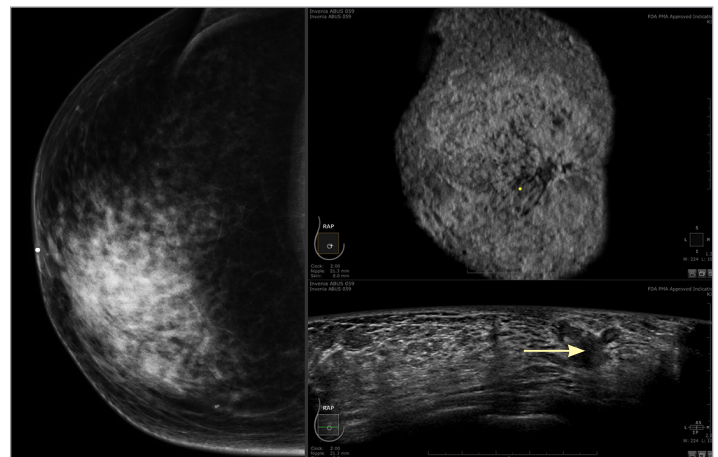
Biopsy proven low grade Invasive Lobular Carcinoma with corresponding mammo.

Summary

ABUS has been used effectively as both a supplementary screening and diagnostic tool in detecting cancers in women with dense breast tissue. Using it to characterize masses and to identify other suspicious areas can increase the efficiency of targeted HH-US and improve patient outcomes.

If you would like to learn more about our technology and training, contact your GE Healthcare sales representative. For more information, visit **www.gehealthcare.com/inveniaabus**, or call 866-281-7545.

1. Pisano et al. Diagnostic Performance of Digital versus Film Mammography for Breast–Cancer Screening. NEJM 2005;353:1773. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4311471/.

Imagination at work