Early Experience with Automated Whole Breast Ultrasound Screening (AWBUS) as an Adjunct to Mammography in Women with Heterogenously or Extremely Dense Breast Tissue and a Normal Screening Mammogram

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Objectives:

We endeavored to review our initial clinical experience with those patients supplementally screened with Automated Whole Breast Ultrasound (AWBUS). Our objective was to quantify the clinical utility of this new technology and uncover any potential indicators of its long term success or failure.

Materials and Methods:

We sequentially scanned 173 women with the SonoCine AWBUS system over an approximate six month period beginning July 22, 2013 and ending January 16, 2014. All women scanned had heterogeneously or extremely dense breast tissue, a normal screening mammogram, and were also not at high enough risk to be screened with MRI. Images were acquired in an automated and reproducible fashion and without the intervention of a Radiologist. Several thousand ultrasound images were seamlessly bound together into a ciné loop and stored to PACS. The ciné loops were then queried, retrieved and read by one of three reading radiologists, each with varying levels of ciné loop reading experience. Patients were recalled for diagnostic ultrasound if any area of interest or suspicion was identified. Confirmed areas of suspicion were biopsied and malignancies were confirmed via pathology.

Results:

Of 173 women screened, 40 (23%) were recalled. The rate of recall dropped precipitously for the most experienced reader who recalled 22 of 130 screens (17%). Of the 40 recalled, 6 were eventually biopsied, resulting in two mammographically occult and pathologically confirmed malignancies. Both were IDC with tumor sizes of 1.1cm and 1.4cm in women with heterogeneously dense breasts (BIRADS Composition – 3). The positive predictive value for automated whole breast ultrasound (PPV1) is 5% and the positive predictive value for biopsy (PPV2) is 33%. The cancer detection rate of 2 in 173 women screened can be extrapolated to 11.5 in 1,000.
Conclusions:

The analysis of our early experience utilizing AWBUS supports its clinical utility in identifying mammographically occult cancers in heterogeneously and extremely dense breasted women with normal screening mammograms. Our cancer detection rate was noteworthy while our call back rate and PPVs were very acceptable. Importantly, the call back rate decreased significantly relative to the experience of the reader. We would expect this trend to continue. While these data are encouraging, larger numbers will be needed to confirm our findings.

Abstract Category:

Category II - Clinical Care, Treatments and Processing
   A. Radiology
      3. Novel Imaging Techniques