

**Presenter:**

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**Session: Breast Imaging (Ultrasound)**

**Presentation: Friday, November 30, 2007**

**Start time: 10:50 AM, End time: 11:00 AM**

**Location: E253CD**

**Code: SST01-03**

**Title: The Use of 3-D Ultrasound Images for the Identification and Diagnosis of Breast Cancer**

**PURPOSE**

To evaluate the incremental value of 3-D ultrasound images produced by an automated breast ultrasound system (SomoVu™) for identification and diagnosis of breast cancers.

**METHOD AND MATERIALS**

Patients presenting for screening or diagnostic ultrasound exams between 09/14/05 and 03/30/07 were recruited and signed an IRB-approved informed consent. Lesions were imaged using mammography, hand-held ultrasound (HHUS), SomoVu, and in some cases MRI. Among a subset of these patients who had BI-RADs codes 3, 4, 5, or 6, the visibility of lesions using the SomoVu was then compared with the visibility of these same lesions using the other imaging modalities.

**RESULTS**

A total of 748 breasts in 429 patients were scanned with the SomoVu. A subset of 146 of these diagnostic and screening patients had BI-RADS codes 3, 4, 5, or 6. Breast composition was dense in 116 of these patients, with 103 of 146 (70%) having tissue density 3 and 13 of 146 (9%) having tissue density 4. A total of 117 biopsies were performed within this subset of patients, which identified 45 cancers and 72 benign lesions. In 17 of these cases, patients already had a biopsy proven cancer prior to SomoVu and were assigned BI-RADS code 6. Multifocal or multicentric cancers were found in 13 patients, and bilateral cancers were found in 3 patients. Among the 117 biopsied lesions, 46 were not detected mammographically, 4 lesions in 149 HHUS exams were missed with the first attempt using HHUS, and 1 lesion in 24 (unilateral) breast MRI exams was not detected with MRI. Among the missed lesions, 3-D SomoVu had the most profound effect on 3 of 39 (8%) cancer patients: a second cancer that was not demonstrated on breast MRI; a mammographically occult contralateral cancer; and a cancer not detected on first attempt HHUS. In all three patients, the SomoVu scan added to their surgical management.

**CONCLUSION**

The 3-D image reconstructions made with SomoVu enabled an important group of patients to have more satisfactory outcome, compared to breast imaging using mammography, HHUS and MRI only.

**CLINICAL RELEVANCE/APPLICATION**

3-D ultrasound images of the breast can enable the radiologist to identify and localize breast lesions that could be missed by conventional technologies.