SIEMENS

Breast Imaging Case Study

Automated breast volume scanning is shown to be an alternative for MRI
Courtesy of Dr. Louisy, Burlington Ultrasound and Radiology

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Answers for life.

Epidemiology

Diagnosis

ABVS has the potential of detecting occult disease in dense breasts

Women with dense tissue in 75% or more of the breast have a risk of breast cancer four to six times as great as the risk among women with little or no dense tissue.*

Extensive mammographic density may also make breast cancer more difficult to detect by mammography and thus increases the risk of the development of cancer between mammographic screening tests. Because density influences the detection of cancer, estimates of the risk of breast cancer associated with mammographic density may be distorted. Risk may be underestimated if it is based solely on cancers found during screening because cancers masked by dense tissue will be omitted.*

Risk Factors for Breast Cancer

Risk Factor	Relative Risk
BRCA1 or BRCA2 mutation	10.0–32.0
Family history of cancer (no known mutation)	
1 first-degree relative	1.5–2.0
2 first-degree relatives	3.0
3 or more first-degree relatives	4.0
1 second-degree relative	1.2–1.5
Therapeutic radiation to chest at <30 yr of age	7.0–17.0
Hormonal factors	
Late (age >30 yr) parity or nulliparity	1.2–1.7
Early (age <12 yr) menarche or late menopause (age >55 yr)	1.2–1.3
Combined hormone-replacement therapy (e.g., for 10 or more yr)	1.5
Postmenopausal obesity	1.2–1.9
Alcohol consumption (2 drinks/day vs. none)	1.2
Smoking before first live birth	1.2
Sedentary lifestyle	1.1–1.8
White race	1.1–1.5
Breast density (very dense vs. mainly fatty)	5.0
Atypical ductal or lobular hyperplasia or lobular carcinoma in situ on previous breast biopsy	4.0

Warner E., N Engl J Med 2011; 365(11):1025-32

* N Engl J Med 2007; 356:227-236, January 18, 2007

Patient History

Diagnosis

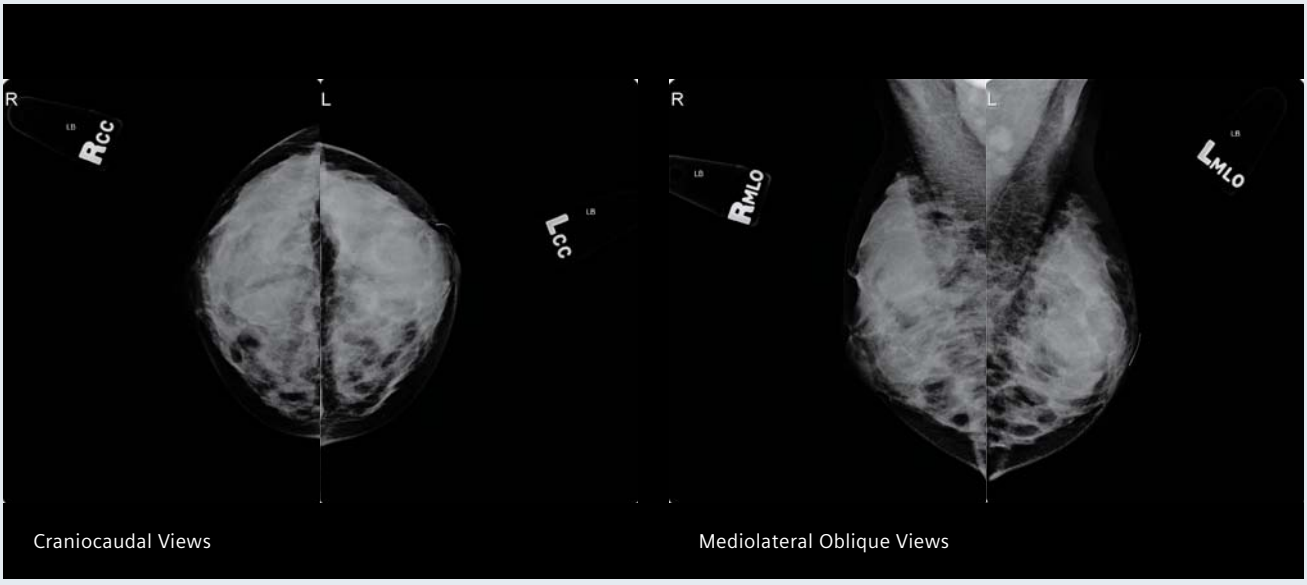
A 23-year-old female patient was referred for a mammogram following excision of a palpable retroareolar nodule in the left breast. The mammogram demonstrated extremely dense breast tissue with no evidence of masses or microcalcifications. An automated breast volume scan (ABVS) was performed which demonstrated a 2.7 cm seroma and multiple small lesions suspicious for multi-focal disease.

- The diagnosis obtained using the ACUSON S2000™ Automated Breast Volume Scanner indicated a suspicion for multi-focal malignancy.
- An MRI examination confirmed the diagnosis obtained with the ABVS: Identified similar lesions.
- A core biopsy confirmed secretory carcinoma – juvenile papillomatosis.

Clinical Images

Diagnosis

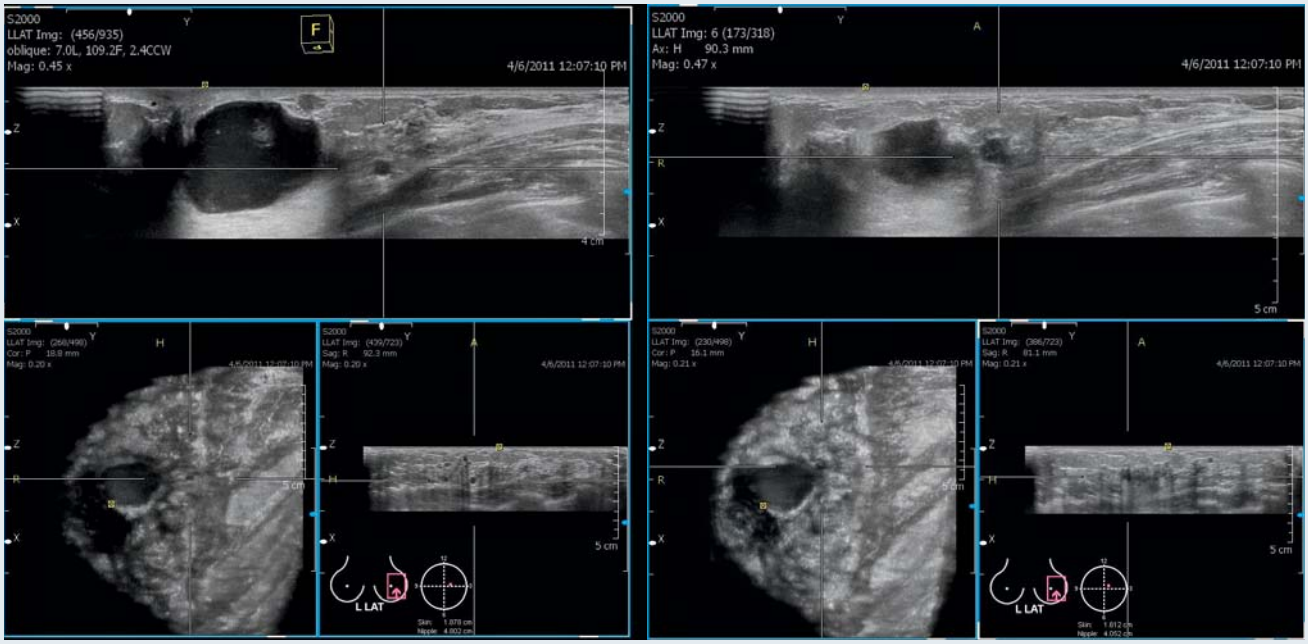
Mammogram



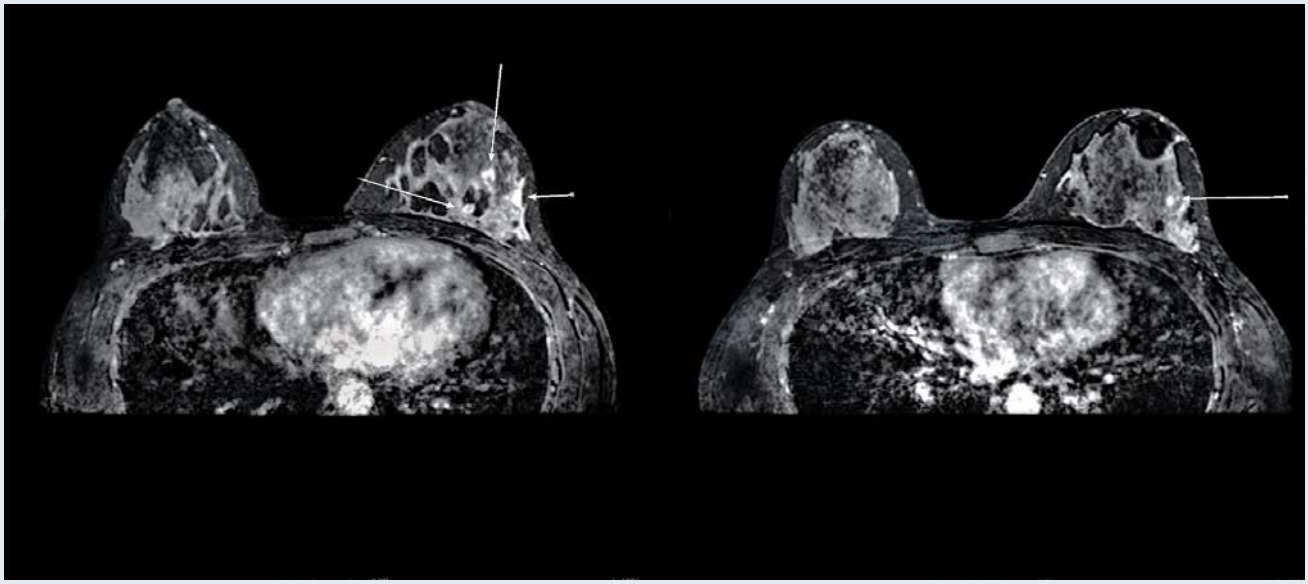
Craniocaudal Views

Mediolateral Oblique Views

3D Breast Ultrasound (ABVS)



MRI



Clinical Conclusion

Treatment & Summary

Prediction | Diagnosis | Treatment | Summary

A mastectomy was performed which revealed 16 lesions; 15 of which were previously confirmed with the ABVS images.

The patient's extremely dense breast tissue made the diagnosis difficult:

- The mammogram was inconclusive.
- The ACUSON S2000 ABVS ultrasound system identified multiple lesions.
- The MRI confirmed the lesions.

Ultrasound Solution Benefits

Summary & Conclusion

Prediction | Diagnosis | Treatment | Summary

Benefits: Greater diagnostic confidence and Reduction in exam time

The ACUSON S2000 ABVS provides:

- Greater diagnostic information with the full breast volumes and unique coronal plane.
- Reproducible, standardized views of the breast reduce operator dependence.
- More efficient surgical planning as a result of the coronal plane and patient's position.

A non-invasive automated breast volume ultrasound takes approximately 20 minutes, as compared to

- Hand held 2D ultrasound, which is operator dependent and can take as long as 45 minutes.
- MRI, which has issues with patient compliance, is invasive in nature due to equipment design and injection and can take up to 1 hour.

ABVS enables disconnection of image acquisition and assessment:

- Reproducible volumes can be rendered and reviewed conveniently at any time, resulting in time shift advantages.

Automated Breast Volume Scanning is a valid alternative for MRI

After mammography demonstrated dense breast tissue and pathology could not be found, an ABVS study found multi-focal lesions, which were later confirmed on MRI. Patients with suspected multi-focal disease are usually referred to MRI, however, the findings confirm that these studies could be done with ultrasound using the ACUSON S2000 ABVS.

Standalone clinical images may have been cropped to better visualize pathology.

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