New Ultrasound Method Detects Breast Cancer

Elastic imaging techniques incorporate manual exam principles to detect how the tissue moves.

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Contributing Writer

CHICAGO — Elastic imaging, a noninvasive ultrasound technique, can help radiologists improve the accuracy of breast cancer diagnosis in women with abnormal mammograms, according to a study of 99 women.

Elastic imaging works by combining ultrasound techniques with the principles of a manual breast exam. This technique evaluates how much breast tissue moves when an examiner pushes on the breast being examined with the transducer, giving an indication of how soft or stiff a particular lesion is.

Examiners use a standard ultrasound machine with additional software to also determine the relative darkness of the lesions as well as the size of each lesion. Stiff lesions that appear black on ultrasound are more likely to be malignant, and soft lesions that appear white are more likely to be benign, Dr. Richard G. Barr said at a press briefing during the annual meeting of the Radiological Society of North America.

Doctors perform about 1.4 million breast biopsies each year, and 80% of them are benign. This technique could help prevent unnecessary biopsies.

"The ultrasound looks to see how the tissues move," he said.

Using a real-time, free-hand elasticity imaging technique along with a routine ultrasound exam, Dr. Barr, a professor of radiology at Northeastern Ohio Universities, Rootstown, studied 166 breast lesions initially identified by mammogram in 99 women undergoing standard screening mammograms.

He measured the largest length in the lesions using both the standard ultrasound image and the elasticity image. If the lesion appeared smaller on the elasticity image than on the standard image, it was classified as benign; if it appeared larger on the elasticity image than on the standard image, it was considered malignant.

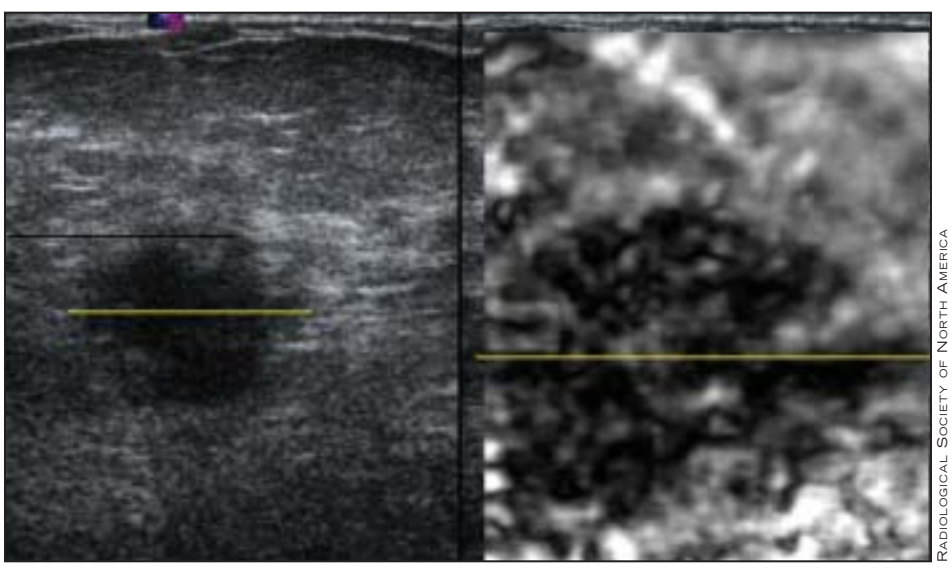
Dr. Barr subsequently performed ultrasound-guided biopsies on 80 patients with 123 lesions to verify the ultrasound findings. The biopsy results indicated that the elastic imaging identified all 17 malignant lesions correctly and 105 of the 106 benign lesions. These findings indicate that the elastic imaging had a sensitivity of 100% and a specificity of 99% in this study.

Citing American Cancer Society data, Dr. Barr noted that doctors perform about 1.4 million breast biopsies each year, and 80% of these biopsies are benign. This technique could help prevent unnecessary breast biopsies in women with suspicious lesions. "There is a potential for us to significantly decrease the number of breast biopsies performed," Dr. Barr said.

He was satisfied that in the study, the lesion always appeared larger on the elasticity image than on the ultrasound image if it was considered malignant, no matter how he and the other researchers positioned the patient to do the ultrasound. "To be useful in a clinical setting, the procedure needs to be robust," he said.

Despite the promising results, Dr. Barr admits that no one is sure exactly why malignant lesions appear larger than benign ones on this specialized ultrasound. "I don't know [why this works]," he said. He added, "I don't think anyone else does."

The FDA recently approved elastic ultrasound imaging, and radiologists will probably begin using this technique within the next 6 months. Dr. Barr noted that a much larger study will be needed to confirm the sensitivity and specificity of this technique. ■



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A lesion that was shown to be invasive ductal carcinoma appears much smaller in a conventional ultrasound image (left) than in an elastic ultrasound image (right).

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