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NEWS

RSNA Press Release

Elasticity Imaging Identifies Cancers and Reduces Breast Biopsies

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At A Glance

- Breast ultrasound with elasticity imaging promises to be a highly specific method for distinguishing benign from cancerous breast lesions.
- Elasticity imaging is noninvasive, analyzes tissue movement and can determine the softness or stiffness of an object.
- Elasticity imaging has the potential to greatly reduce the number of breast biopsies performed in the United States.

CHICAGO — A new ultrasound technique allows radiologists to accurately distinguish benign from malignant breast lesions. Using elasticity imaging, researchers correctly identified both cancerous and harmless lesions in nearly all of the cases studied. The findings were presented today at the annual meeting of the Radiological Society of North America (RSNA).

"In our work, elasticity imaging has been found to have high specificity," said Richard G. Barr, M.D., Ph.D., professor of radiology at Northeastern Ohio Universities College of Medicine and radiologist at Southwoods X-Ray and MRI in Youngstown. "If our results can be reproduced in a large, multicenter trial, this technique could significantly reduce the number of breast biopsies required."

The American Cancer Society (ACS) estimates that 212,920 women will be diagnosed with breast cancer in the United States this year. Early detection through screening is the best way to combat cancer at its early, most treatable stage. While mammography is the standard breast cancer screening exam, screening with magnetic resonance imaging (MRI) or ultrasound may be more effective for high-risk patients or women with dense breast tissue. MRI and ultrasound depict more breast lesions than mammography but have low specificity, meaning they are less effective at distinguishing benign from malignant lesions, resulting in a high number of invasive biopsies. ACS reports that 80 percent of breast lesions biopsied are found to be benign.

Elasticity imaging is a modification of a routine ultrasound exam. It is like a manual self-exam but much more sensitive. The noninvasive technique works by gauging how much tissue moves when pushed, and it can detect how soft or stiff an object is.

"There are no needles," Dr. Barr explained. "The patient does not notice any difference from a standard ultrasound."

Dr. Barr used a real-time, free-hand, elasticity imaging technique in correlation with a

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routine ultrasound exam to study 166 lesions identified and scheduled for biopsy in 99 patients. Lesions were measured for the largest length on both the standard ultrasound image and the elasticity image. Lesions where the elasticity image was smaller than the standard image were characterized as benign, and lesions where the elasticity image was larger were characterized as malignant. Ultrasound-guided biopsies were performed on 80 patients with 123 lesions. Biopsy showed that elasticity imaging correctly identified all 17 malignant lesions and 105 of 106 benign lesions, for a sensitivity of 100 percent and a specificity of 99 percent.

"Our ability to find lesions in the breast has increased significantly over the last 10 years but at the expense of an increased number of biopsies," Dr. Barr said. "This technique could significantly reduce the number of biopsies and increase the confidence of women that a detected lesion is truly benign."

He anticipates that elasticity imaging will also help in detecting cancers, but did not evaluate that capability for this study. Dr. Barr and colleagues are planning to expand their research in an international, multicenter trial beginning in January 2007.

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RSNA is an association of more than 40,000 radiologists, radiation oncologists, medical physicists and related scientists committed to promoting excellence in radiology through education and by fostering research, with the ultimate goal of improving patient care. The Society is based in Oak Brook, Ill.

Editor's note: The data in these releases may differ from those in the printed abstract and those actually presented at the meeting, as researchers continue to update their data right up until the meeting. To ensure you are using the most up-to-date information, please call the RSNA Newsroom at (312) 949-3233.

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