Elastography Useful as Adjunct to Breast US

BY PATRICE WENDLING

VITALS

Major Finding: Elastography correctly identified 98% of lesions shown on biopsy to be malignant, and 78% of lesions shown on biopsy to be benign.

Data Source: A study of 193 women.

Disclosures: Dr. Destounis disclosed being a consultant for Carestream Health Inc., an advisory board member for Siemens AG, and an investigator for Siemens, Fujifilm Holdings Corp., Hologic Inc., and U-Systems Inc.

CHICAGO — The use of elastography, or the ability to measure the stiffness of lesions during ultrasound, may help distinguish benign from malignant breast lesions, suggest results of a study of 193 women.

Elastography correctly identified 98% of lesions that were shown on biopsy to be malignant. With biopsied benign lesions, elastography properly identified 78% of the lesions, Dr. Stamatia V. Destounis, a diagnostic radiologist at a breast-imaging and diagnosis center in Rochester, N.Y., reported in a poster at the annual meeting of the Radiological Society of North America.

"The addition of elastography could potentially help decrease the need to perform a biopsy, or could reduce the need for additional imaging of benign lesions, thus reducing the associated patient anxiety," she told reporters, noting that as many as 20% of young women have breast fibroadenomas.

Elastography software has been available for some time, but is having a resurgence in recent years, particularly in thyroid, prostate, and breast applications as the technology advances and the software is included on new imaging units. The technology can also be applied to a standard unit without an additional upgrade, with the images read side by side, she said at a press briefing.

Overall, elasticity imaging increases the specificity of ultrasound by measuring the compressibility and mechanical properties of a lesion. Tumors are typically stiffer than surrounding tissue, whereas cysts demonstrate a "bull's eye" appearance on elastography, Dr. Destounis said. Cancerous lesions also tend to be larger than benign findings on elastography.

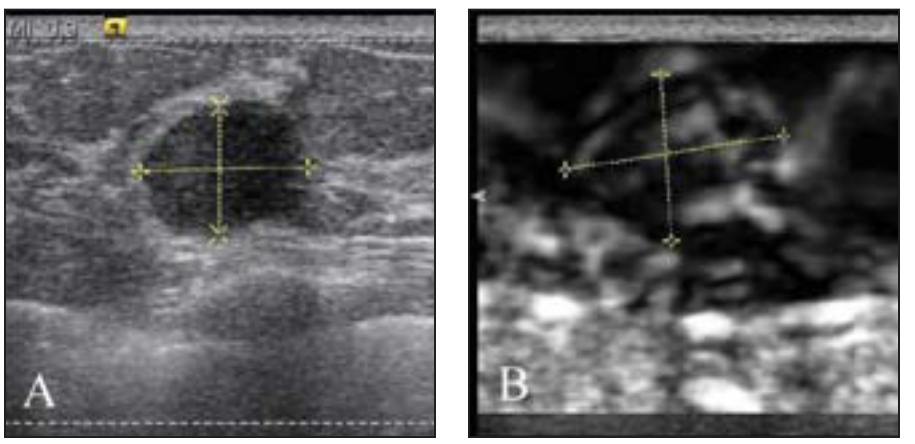
The study was conducted in 2007-2009 and included 193 patients (average age, 54 years) who underwent elastography at the time of standard breast ultrasound utilizing a Siemens Sonoline Antares or Siemens S2000 ultrasound unit.

Although the data are early, elastography is a promising adjunct imaging tool.

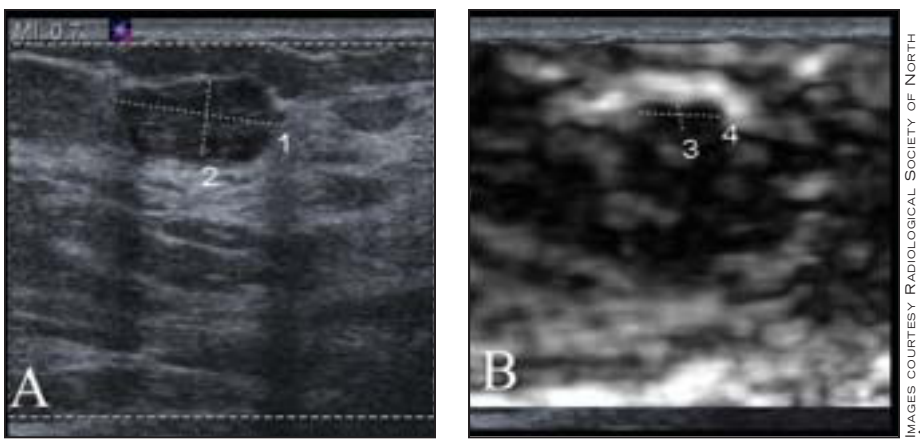
DR. DESTOUNIS

A total of 58 lesions did not undergo biopsy and were predetermined to be benign. Biopsies were performed in 140 lesions, of which 59 were cancers, 69 were benign, 1 was an atypical papillary neoplasm, and 11 were cyst aspirations in which fluid was drained and the abnormality resolved. Of the 140 biopsies, the elastogram image correlated with the standard B-mode ultrasound image in 58 of the 59 cancers (98%), said Dr. Destounis, also of the department of imaging sciences at the University of Rochester.

Of the 69 benign findings observed, the elastogram and B-mode ultrasound images correlated in 54 (78%) of cases.



This ultrasound (left) shows a solid mass. When elasticity software is applied, the mass is noticeably larger (right). Biopsy proved this to be invasive cancer.



The nodule on ultrasound (left) appears consistent with a known fibroadenoma. Elasticity imaging (right) shows the fibroadenoma as markedly smaller.

IMAGES COURTESY RADIOLOGICAL SOCIETY OF NORTH AMERICA

Four did not correlate and measured larger on elastography, and 11 cases were unclear, she said.

Although the data are early, elastography is a promising adjunct imaging tool, Dr. Destounis said.

"Women are becoming more and more concerned about unnecessary procedures and unnecessary needle biopsies and the anxiety that creates," she said. "I think this may be an additional tool, specifically for some of the benign findings like the fibroadenomas in young women or some of the cystic structures that you can really identify with elastography. You have to use your clinical judgment. I'm not using elastography in a vacuum. I'm using it in correlation with everything else."

For some women, the information gained through elastography will be enough to defer a biopsy, but others will not be comfortable until a biopsy has been performed, she said. ■

Algorithm for Evaluating Palpable Breast Mass Recommended

BY ROBERT FINN

SAN FRANCISCO — A proper evaluation of a palpable breast mass is important not only for quality of care but also because a delayed cancer diagnosis due to a negative clinical exam or a negative mammogram is a primary cause of malpractice awards in this area, according to Dr. Leah Karliner.

Studies have shown that over a 10-year period, about 16% of women aged 40-69 years bring a concern about their breasts to primary care physicians.

While the majority of palpable breast masses turn out to be benign cysts or fibroadenomas, breast cancer is found in 11% of women complaining of a breast lump and 4% of women with any breast complaint, she said said at a meeting on women's health sponsored by the University of California, San Francisco.

The classic characteristics of a malignant mass are well known. Cancer is more likely if there is a single lesion, if it's hard and immovable, if it has irregular borders, and if it's 2 cm or more in diameter.

"Unfortunately, cancers are often soft and cystic, movable, regular, [and] small," said Dr. Karliner of the division of general internal medicine at the university. Furthermore, "benign lesions can be single, like cancers are supposed to be."

With the clinical characteristics so unreliable, Dr. Karliner recommended the following algorithm when evaluating a woman with a palpable mass. Decisions are fairly simple for older women, those above the age of 30-35 years. All such women who come in complaining of a mass should receive a diagnostic mammogram, both to evaluate the mass and to search for occult malignancies elsewhere in the same breast. According to one study of 41,000 women with self-reported breast lumps, diagnostic mammography alone has a sensitivity of 87.3% and a specificity of 84.5%.

But that means diagnostic mammography misses 10%-20% of breast cancers. The addition of ultrasound to the mammogram, however, increases the negative predictive value to 97%.

The so-called triple diagnosis, consisting of a physical exam, mammography, and skilled fine-needle aspiration (FNA) biopsy, misses very few cancers, Dr. Karliner said. If all three tests are negative, it's safe to schedule follow-up exams every 3-6 months for a year. If all three are positive, the patient should be referred for definitive treatment. And if any one test is suggestive of malignancy, the patient should have a core or excisional biopsy.

The algorithm for younger women presenting with a self-reported lump has a more complex decision tree, with the evaluation depending on whether the physician can feel the lump and whether the woman is at high risk.

If the physician can't feel a dominant mass on physical exam and the woman is of average risk, she should return in 2-3 months for a reexamination, and if the lump is then palpable she should undergo a further work-up.

If the physician can't feel a dominant mass and the woman is at high risk, with first-degree relatives who had cancer at a young age, she should be referred to a breast surgeon or clinic. The surgeon or clinic may choose to do a further work-up or simply to follow her closely.

If the physician can feel a palpable lump in a younger woman, and if she's at average risk and the exam is not concerning, she should return for a reexamination 3-10 days after her next menses.

If that younger woman with a palpable lump is at high risk, or if the exam is concerning, "you want an ultrasound first, if the mass doesn't feel cystic," she said. "If the mass does feel cystic, it's an option to go ahead and FNA it first, and see if you can resolve the mass with that. ■

Disclosures: *None was reported.*