Batch MRI Breast Cancer Screening Possibility With Accelerated Protocol

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By Leah Lawrence

Expert radiologists were able to screen magnetic resonance images and rule out breast cancer diagnosis with a negative predictive value of about 99% using an abridged breast MRI protocol in a single-center study presented Saturday at the ASCO Breast Cancer Symposium 2013.

SAN FRANCISCO—Expert radiologists were able to screen magnetic resonance images and rule out breast cancer diagnosis, with a negative predictive value of about 99%, using an abridged breast MRI protocol in a single-center study presented Saturday at the American Society of Clinical Oncology (ASCO) Breast Cancer Symposium 2013.

“In this preliminary, small, proof-of-principle study we have shown that an MR table time of less than 3 minutes and radiologist reading time of less than 3 seconds can help rule out breast cancer with a negative predictive value of 98.9%,” said study presenter Christiane K. Kuhl, MD, of the University of Aachen, Aachen, Germany.

MRI is not currently used for screening of breast cancer on a broad scale due to high direct and indirect costs, and the length of time associated with acquiring and reading images. However, according to Dr. Kuhl, MRI may be a better imaging modality for detecting more invasive or aggressive cancers when compared with mammography.

The cancers diagnosed using mammography tend to be slowly growing cancers or cancers that may not progress to a lethal disease, she said. In contrast, the better a breast cancer is at inducing angiogenesis and protease activity, the more likely that it will be found on MRI.

“Using an imaging test that has a bias towards rapidly growing, biologically aggressive, invasive disease may help avoid overdiagnosis,” Dr. Kuhl said.

Dr. Kuhl and colleagues examined an abridged MRI protocol that used the first post contrast subtracted (FAST) images and their maximum intensity projection (MIP).

“Our expectation was that we would trade in some of the high sensitivity of MRI and invest it into acquisition,” Kuhl told Cancer Network. “To our surprise, [we found] that the diagnostic accuracy was equivalent.”

The protocol was tested in 443 women at high risk for breast cancer who had negative digital mammography. The researchers had experienced breast radiologists review the MIP images looking for significant enhancement followed by evaluation of the FAST images for further categorization of enhancement. Later, all patient images were analyzed using the full diagnostic breast MRI protocol. Patients had an average table time of 3 minutes compared with 21 minutes for the full MRI protocol. In addition, the experienced radiologists were able to read the MIP images in about 2.8 seconds and the FAST images in about 28 seconds.

Using the full MRI protocol, 11 breast cancers were diagnosed; all were classified as intermediate grade or high grade. Four of the cancers were ductal carcinoma in situ and seven were invasive. The mean size of the cancers was 8 mm.

Radiologists identified cancers using MIP images in 9 of 11 cases (82%). Both the FAST images and the full MRI protocol positively identified 10 of 11 cancers (91%).

In addition, the specificity of the FAST images at 94.4% was equivalent to that of the full MRI protocol. Thirty-three false positives occurred using FAST images compared with 35 for the full protocol.

“FAST screening thereby compares favorably with mammographic screening with regards to the time needed to acquire and review the images,” Dr. Kuhl concluded.

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