MRI Scans Detect More Cancer in Women With Dense Breasts

Adding a second screening method finds more early cancer between mammograms but also leads to more false positives.

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Adding magnetic resonance imaging (MRI) to regular mammograms improves the ability to detect small, early breast tumors that are easier to treat in women with very dense breasts, according to a new study.

However, the chances of developing breast cancer between regularly scheduled mammograms is low, and combining the two methods produces more false positives, which can lead to unnecessary follow-up testing and treatment. It is not yet clear whether more intensive screening will ultimately save lives.

As described in The New England Journal of Medicine, Marije Bakker, PhD, of Utrecht University in the Netherlands, and colleagues conducted a study to see whether supplemental MRI for women with extremely dense breast tissue would improve early detection and reduce the diagnosis of interval breast cancers, as tumors detected between normal mammograms are known.

Nearly half of women under age 40 have dense breast tissue, and about 10% have very dense breasts, meaning their breasts have more fibrous connective tissue relative to glandular or fatty tissue. Several states require providers to inform women that they have dense breasts, but what action such women should take is not yet clear.

Dense breast tissue makes it more difficult to see small tumors on mammograms, which use low-energy X-rays. MRI uses strong magnetic fields and radio waves to create images of organs and tissues. A contrast agent is usually administered by IV to improve visibility. Ultrasound is another screening method sometimes used for those with dense breast tissue.

This randomized, controlled trial enrolled more than 40,000 women ages 50 to 75 in the Netherlands. They were classified as having extremely dense breast tissue and had normal results on screening mammograms performed every other year.

The participants were randomly assigned to receive mammograms alone or an invitation to undergo supplemental MRI screening in addition to mammography. About 60% of the latter group accepted the offer.

Within two years after screening, interval breast cancers were detected at a rate of 2.5 per 1,000 screenings in the mammography plus MRI group compared with 5.0 per 1,000 screenings in the mammography only group. That is, these cancers were detected twice as often in the combination screening group, suggesting that mammograms alone missed some of them.

Within the MRI invitation group, four of the 20 diagnosed interval cancers were detected in women who did in fact undergo MRI screening (a rate of 0.8 per 1,000 screenings) while 16 occurred in those who declined the invitation (4.9 per 1,000 screenings). The cancer detection rate among women who actually underwent MRI screening was 16.5 per 1,000 screenings.

The positive predictive value—meaning a test correctly detects cancer when it is present—was 17% for recalls for additional testing and 26% for breast biopsy. In other words, more than 80% of women called back for more testing and nearly three quarters of those who underwent biopsies were found not to have cancer. The false positive rate—meaning a test incorrectly suggests cancer that is not present—was 79.8 per 1,000 screenings, or about 8%.

“The use of supplemental MRI screening in women with extremely dense breast tissue and normal results on mammography resulted in the diagnosis of significantly fewer interval cancers than mammography alone during a two-year screening period” the study authors concluded.

MRI screening was generally safe. Among women who underwent MRIs plus mammography, just 0.1% experienced adverse events during or immediately after the MRI screenings.

Although uncommon, these events must be balanced against the benefits of more intensive screening. Women with false-positive MRI results may undergo unnecessary further testing and treatment, which can lead to side effects. Even when accurate, more intensive testing detects small cancers that might never have progressed to a life-threatening stage, dubbed overdiagnosis. What’s more, MRI screening is substantially more expensive than mammography, and it may not be covered by insurance.

Importantly, follow-up was short in this study, and it is not possible to say whether, over a longer term, adding MRI screening to mammograms would reduce the risk of death from breast cancer.

“Our dilemma is that, for most tumors, we cannot tell the difference between cancers that can kill you and those that cannot,” Dan Longo, MD, of Harvard Medical School wrote in an editorial accompanying the study report. “The ultimate test of the value of MRI screening” in these women will be “whether it improves survival—an answer that we will not have for a very long time.”

Click here to read the study abstract.
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