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Tomosynthesis vs. Mammogram for Breast Cancer Screening: The Latest Evidence

Announcer:
Welcome to *Project Oncology* on ReachMD. On this episode, sponsored by Lilly, we're joined by Dr. Manisha Bahl, who's a breast imaging radiologist and Assistant Professor of Radiology at Harvard Medical Center and the former Director of the Breast Imaging Fellowship Program at the Massachusetts General Hospital in Boston. Dr. Bahl is here to share the latest evidence on tomosynthesis versus mammography for breast cancer screening. Let's hear from her now.

Dr. Bahl:
Tomosynthesis was first approved by the United States Food and Drug Administration in 2011 and is widely used in breast imaging for screening and diagnostic purposes. In fact, about 75% of all accredited breast imaging facilities have tomosynthesis capability.

Now, conventional 2D digital mammography is limited by overlapping tissue structures, which can mask breast cancers or can lead to false positive findings caused by tissue overlap.

With digital breast tomosynthesis, images are acquired as low-dose x-ray projections in a limited arc around the breast, which are then reconstructed into thin section images. The ability to scroll through the stack of thin section images improves the detection of lesions and minimizes the masking effect of overlying tissues.

The benefits of tomosynthesis are well established. In the screening setting, tomosynthesis has led to higher invasive cancer detection rates and fewer false positive findings when compared to conventional 2D digital mammography.

Although much of the research has focused on the screening setting, tomosynthesis has also led to higher accuracy and higher radiologist confidence in the diagnostic setting.

Yet, tomosynthesis does have limitations.

First, some practices acquire the 2D images and tomosynthesis images separately, which increases radiation dose. Instead, synthesized mammography can be used in which a 2D mammogram is created based on the tomosynthesis images. As such, a separate 2D exam does not need to be acquired, which reduces the radiation dose by nearly 50%.

Second, tomosynthesis exams take a longer time to interpret than conventional 2D digital mammograms because tomosynthesis exams have more images. However, tomosynthesis has streamlined the diagnostic workflow and minimized the need for short-term follow-up exams.

The third limitation is that, although cancer detection rates are higher and false positive findings are lower with tomosynthesis for women across age groups and breast density categories, these benefits seem to be minimal in women with extremely dense breast tissue.

The final issue I'll address is that the ultimate goal of screening is to reduce mortality from breast cancer. We know that conventional 2D digital mammography has led to a reduction in breast cancer mortality based on large randomized control trials. And we assume that tomosynthesis leads to the same mortality benefit. However, we do not know whether tomosynthesis confers any additional mortality benefit when compared with conventional 2D digital mammography.

To answer that question with regard to the impact of tomosynthesis screening on breast cancer mortality, a randomized trial is currently underway. The tomosynthesis mammographic imaging screening trial, or TMIST, is an NIH funded randomized trial to compare tomosynthesis with conventional 2D digital mammography for breast cancer screening. The trial is enrolling healthy women aged 45 to

74, who are already planning to get screening mammograms, and randomly assigning those women to screening for several years with tomosynthesis versus screening for several years with 2D digital mammography. Participants will be followed for up to eight years.

Now, TMIST is not a traditional study of the diagnostic accuracy of tomosynthesis versus 2D digital mammography. Instead, the primary endpoint is to compare the number of advanced cancers found, as women who undergo regular screening are more likely to survive breast cancer if a screening test allows their cancers to be detected before the cancer becomes advanced.

TMIST will help us understand the types of cancers that are detected with tomosynthesis versus 2D mammography, and the data collected will ultimately help us address one of the most important unanswered questions about tomosynthesis screening, which is its impact on breast cancer mortality.

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