

Combo tumor imaging can distinguish malignant and benign breast tumors, help avoid biopsies

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Imaging breast tumors using four approaches together can better distinguish malignant breast tumors from those that are benign, compared with imaging using fewer approaches, and this may help avoid repeat breast biopsies, according to a study published in *Clinical Cancer Research*, a journal of the American Association for Cancer Research.

"By assessing many functional processes involved in cancer development, a multiparameter PET-MRI of the breast allows for a better differentiation of benign and malignant breast tumors than currently used DCE-MRI alone. Therefore, unnecessary breast biopsies can be avoided," said Katja Pinker, MD, associate professor of radiology in the Department of Biomedical Imaging and Image-guided Therapy at the Medical University of Vienna in Austria.

The new imaging technique, called multiparametric (MP) 18FDG PET-MRI, which used four imaging approaches, was 96 percent accurate in distinguishing malignant breast tumors from those that were benign, and provided better results than combinations of two or three imaging approaches. The study estimates that this technique can reduce unnecessary [breast biopsies](#) recommended by the commonly used imaging method, the DCE-MRI, by 50 percent.

"DCE-MRI is a very sensitive test for the detection of breast tumors, but is limited in visualizing the functional properties cancer cells acquire

during development. Therefore, there is still room for improvement," explained Pinker. "PET-MRI mirrors cancer biology and allows accurate diagnosis of [breast cancer](#) without a biopsy. Additionally, the more accurately we understand a tumor's biology, the better we can tailor therapy to each breast [cancer](#) patient's individual needs.

"Provided that a hospital is equipped with a PET-CT and an MRI scanner or a combined PET-MRI, the technique we have described can be immediately implemented in clinics," said Pinker.

Pinker and colleagues recruited 76 patients to the study who had suspicious or inconclusive findings from a mammography or a breast ultrasonography. They performed a MP 18FDG PET-MRI on all the patients. In addition, all patients' [breast tumor](#) biopsies were evaluated by histopathology.

To determine the combination of imaging parameters that yielded the most accurate results, Pinker and colleagues combined the imaging data from two parameters, three parameters, and all four parameters. All two-parameter and three-parameter evaluations included DCE-MRI.

All results were compared with histopathology diagnosis to evaluate which combination was most efficient in making an accurate diagnosis. Of the 76 tumors, 53 were malignant and 23 were benign, based on histopathology.

The researchers found that none of the two- or three-parameter combinations reached the same level of sensitivity and specificity as the four-parameter method, which had an AUC of 0.935. (An AUC of 0.9 to 1 means the method is excellent, and an AUC of 0.5 means the method is worthless.)

"Performing a combined PET-MRI is currently less cost-effective than

existing breast imaging methods," said Pinker. "However, a significant reduction in unnecessary [breast](#) biopsies by using this combined method may improve the cost-effectiveness."

MP 18FDG PET-MRI allowed tumor imaging by four parameters: DCE-MRI, DWI, 3D 1H-MRSI, and 18FDG-PET.

Provided by American Association for Cancer Research

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