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New statistical model could help reduce breast-lesion biopsies

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A new method of characterizing breast lesions found during an MRI exam could result in fewer biopsies of benign tumors with the benefits of reduced pain and expense for patients and providers, according to a paper that will be presented today (Sunday, Nov. 30) at the annual meeting of the Radiological Society of North America (RSNA).

Wendy DeMartini, M.D., and colleagues in the breast imaging department at the Seattle Cancer Care Alliance developed a preliminary statistical model that breast radiologists could use eventually when deciding whether a lesion found on breast MRI is likely to be malignant or benign. Their retrospective review of almost 2,600 breast MRI exams performed during a four-year period at the SCCA found three crucial patient and lesion characteristics that, when used in combination, could predict the likelihood of malignancy, including identifying some lesions with probabilities of cancer close to zero.

Such a model, if confirmed by more research, could be beneficial because MRI exams are so sensitive that they reveal cancerous and non-cancerous lesions that often look alike and behave similarly when contrast dye is injected into the patient. Biopsy is often necessary to determine whether a lesion is cancerous. Statistical models may improve the ability to distinguish between such lesions and avoid unnecessary biopsies.

The researchers looked at several patient and lesion characteristics that radiologists take into account now when deciding whether a biopsy is

required for diagnosis. They found three categories of characteristics that, when taken together, were the best at predicting malignancy. These were the reason that the women was having a breast MRI, the size of the lesion, and the lesion enhancement pattern from the the MRI contrast dye.

Lesions found in women undergoing MRI to look for additional malignancy after new breast cancer diagnosis, lesions that were found to be larger than one centimeter, and those whose enhancement quickly faded (called washout) were the most likely to be malignant, according to DeMartini, who is an assistant professor in the University of Washington School of Medicine.

In contrast, breast lesions found in women being screened because they are considered to be at high risk for developing cancer, that were found to be small lesions and increased their enhancement over time were very likely to benign.

"If the lesions had those three characteristics, the likelihood of malignancy was 1 percent," said DeMartini. "This is so close to zeros that rather than doing a biopsy we could instead follow the patient by doing another MRI in a few months, or we may not need to do any additional testing."

DeMartini cautioned that more research is needed before this statistical model can be validated for use as standard practice.

"This is a preliminary model. Future work will look at additional patient and lesion features and in the longer term we need to examine lesions from multiple practice sites," she said. "Our goal is to identify a group of lesions that we currently recommend for additional tests where the likelihood of cancer is so low that we can safely avoid additional testing."

Source: Fred Hutchinson Cancer Research Center