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'Smarter' ordering of breast biomarker tests could save millions in health care dollars

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A review of medical records for almost 200 patients with breast cancer suggests that more selective use of biomarker testing for such patients has the potential to save millions of dollars in health care spending without compromising care, according to Johns Hopkins researchers.

Specifically, waiting to perform these tests until a patient has a full excisional biopsy instead of "reflexively" or automatically testing for them on initial small "core" biopsies could save as much as $117 million, according to a report on the study published in the July issue of The American Journal of Surgical Pathology.

Pathologists traditionally have tested for the biomarkers estrogen receptor (ER), progesterone receptor (PR) and human epidermal growth factor receptor 2 (Her2) on breast cancers in excisional biopsy specimens, when a surgeon removes all or a large portion of the tumor, to help guide drug treatment.

Over the past 10 years, however, there's been a shift toward testing of core biopsies—the initial small samples of breast cancer removed through a small needle—for these markers, says senior study author Pedram Argani, M.D., director of the Breast Pathology Service at The Johns Hopkins Hospital and a professor of pathology and oncology at the Johns Hopkins University School of Medicine: "The main reason is that some of these patients may receive chemotherapy before their surgery (neoadjuvant chemotherapy) instead of after (adjuvant chemotherapy), and if they receive neoadjuvant chemotherapy, knowing the markers

beforehand is important."

But some experts question the routine use of core biopsy marker testing. Many patients do not receive neoadjuvant chemotherapy, as many of the tumors detected today are too small to be eligible for the therapy. For patients who do not receive neoadjuvant chemotherapy, a negative biomarker test on their smaller core biopsy may not reflect the results in the larger excision specimen, because biomarkers may appear in some parts of the tumor but not in others, Argani says. "That means pathologists generally have to repeat a biomarker test that is negative in the core biopsy on the excision specimen."

To investigate whether smarter, less routine use of small sample marker testing would make sense clinically and financially, researchers led by Christopher J. VandenBussche, M.D., Ph.D., an assistant professor of pathology at the Johns Hopkins University School of Medicine, studied records for 197 patients with breast cancer at Johns Hopkins who had so-called reflex biomarker testing done after small sample core needle biopsy. Among those patients, just 27 (13.6 percent) received chemotherapy before surgery, and eight (4 percent) showed no residual cancer during excisional biopsy. In those cases, researchers noted, biomarker testing on the core biopsy was necessary.

However, none of the remaining 162 patients received chemotherapy before surgery, and that treatment was considered only in a minority of those patients. Only five patients (3 percent) were seen by a radiation oncologist and medical oncologist before surgery, while only six (4 percent) were seen only by a medical oncologist. Forty-four patients (26 percent) visited only a radiation oncologist before surgery, but these visits were largely for decisions about local therapy, such as lumpectomy versus mastectomy, not chemotherapy.

On repeat testing after excisional biopsy, researchers noted that three of

the 18 cancers (17 percent) that were ER-negative in core biopsy samples were now found to be positive on excision, and one of the 24 (4 percent) cancers that was PR-negative in core biopsy samples was now positive on the excision. On repeat Her2 testing, one of the 42 cancers (2.4 percent) that was Her2-negative in the core biopsy was positive on the excision. These results are consistent with those of other research groups, indicating that testing the larger sample helps pick up tumors that carry biomarkers in some areas but not others and that are eligible for targeted therapy, Argani says.

Analyzing costs and benefits, the researchers found that if all negative core biopsy tests been repeated, the increased costs would potentially have been more than $100,000, or about $500 per patient. The researchers estimated that if these costs were applied to the 230,000 new breast cancer cases diagnosed in the United States each year, they would total as much as $117 million annually.

"We suggest that clinical breast cancer teams consider stopping the practice of reflex testing of core needle biopsies, because the results typically do not guide the next step in therapy," Argani says. "A more logical, cost-effective approach would be to perform such testing only if chemotherapy before surgery is a serious consideration for that individual patient."

There are other cancers, such as colon cancer and lung cancer, for which testing is done for different genetic markers that guide treatment, Argani adds, "and when you do it reflexively on all specimens, you often end up repeating your tests on different specimens from the same patient and again driving up costs for no reason." Treating clinicians using these tests may not realize the costs, he says, because the tests are done reflexively without a specific order for that patient, and the bill comes not from the treating clinician but from the hospital pathology department.

"It's our hope that people will look at this and start thinking about how to change policies," Argani says. "It would be smart for most if not all medical centers to consider limiting their breast core biopsy biomarker testing to cases in which chemotherapy before surgery is a serious clinical consideration."

Other authors on the paper are Ashley Cimino-Mathews, Ben Ho Park and Leisha A. Emens, all of The Johns Hopkins University, and Theodore N. Tsangaris of Thomas Jefferson University (formerly of The Johns Hopkins University).

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