Study finds substantial variability in rate of additional surgery after partial mastectomy

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Nearly one in four women who undergo a partial mastectomy for treatment of breast cancer have another surgery to remove additional tissue (reexcision), and there is substantial surgeon and institutional variation in the rate of reexcisions that cannot be explained by patients' clinical characteristics, according to a study in the February 1 issue of *JAMA*.

The current environment of health care reform in the United States calls for increasing physician and hospital accountability and transparency of health care outcomes. "Breast-conserving therapy, or partial mastectomy, is one of the most commonly performed cancer operations in the United States," according to background information in the article. "Currently, there are no readily identifiable quality measures that allow for meaningful comparisons of breast cancer surgical outcomes among treating surgeons and hospitals."

Partial mastectomy is optimally performed by achieving adequate surgical margins (the rim of normal tissue around the breast cancer) during the initial surgical resection while maintaining maximum cosmetic appearance of the breast. Failure to achieve appropriate margins at the initial operation will require additional surgery. These additional operations can produce considerable psychological, physical, and economic stress for patients and delay use of recommended supplemental therapies. "Thus, the effect of reexcision on altering a patient's initial treatment of choice is significant," the authors write.

Laurence E. McCahill, M.D., of the Richard J. Lacks Cancer Center, Van Andel Research Institute, and Michigan State University, Grand Rapids, Mich., and colleagues conducted a study (between 2003 and 2008) to measure variation in reexcision rates across hospitals and surgeons treating patients with similar clinical conditions. The study included women with invasive breast cancer undergoing partial mastectomy from 4 institutions (a university hospital [University of Vermont] and 3 large health plans [Kaiser Permanente Colorado, Group Health, and Marshfield Clinic]). Data were obtained from electronic medical records and chart abstraction of surgical, pathology, radiology and outpatient records.

The study included 2,206 women with 2,220 newly identified invasive breast cancers who underwent a breast-conserving first surgical procedure. The average age for patients was 62 years and 92.8 percent of patients with reported race/ethnicity were non-Hispanic white. Overall, 509 patients (22.9 percent) underwent additional surgery on the affected breast. Among these patients, 454 (89.2 percent) underwent a single reexcision, 48 (9.4 percent) underwent 2 reexcisions, and 7 (1.4 percent) underwent 3 reexcisions. Among all patients undergoing initial breast conservation, a total mastectomy was subsequently performed in 190 patients (8.5 percent).

"Reexcision rates for margin status following initial surgery were 85.9 percent for initial positive margins [cancer cells at the edge of the removed tissue], 47.9 percent for less than 1.0 mm margins, 20.2 percent for 1.0 to 1.9 mm margins, and 6.3 percent for 2.0 to 2.9 mm margins. For patients with negative margins [no cancer cells at the outer edge of the tissue that was removed], reexcision rates varied widely among surgeons (range, 0 percent - 70 percent) and institutions (range, 1.7 percent - 20.9 percent). Reexcision rates were not associated with surgeon procedure volume after adjusting for case mix," the authors write.

The researchers also observed variation in the reexcision of positive margins among institutions, with rates ranging between 73.7 percent and 93.5 percent. This may reflect institutional variation in surgeons' training, regional variation in interpretation of the required criteria for reexcision, or both, they write.

"Our study highlights the value of multicenter observational studies in demonstrating variability in health care across geographic regions and different health systems, with uniform data collection instruments. The long-term effect of this variability is beyond the scope of our study, but it is feasible that outcomes such as local recurrence and even overall survival could be affected by variability in initial surgical care. Even in the absence of effects on local control, the wide level of unexplained clinical variation itself represents a potential barrier to high-quality and cost-effective care of patients with breast cancer. Continued comparative effectiveness research of breast cancer surgery requires further attention to better determine the association of initial surgical care with long-term patient outcomes," the authors conclude.

Monica Morrow, M.D., of the Memorial Sloan-Kettering Cancer Center, New York, and Steven J. Katz, M.D., M.P.H., of the University of Michigan. Ann Arbor, comments on the findings of this study in an accompanying editorial.

"The article by McCahill et al underscores the challenge in developing surgical quality indicators for patients with cancer, especially for procedures with very low risk of major complications. While there is strong evidence that positive margins are associated with an increased rate of local recurrence, a substantial number of reexcisions are performed among patients with negative margins to obtain a more widely clear margin. There is no consensus among surgeons and radiation oncologists as to what constitutes an optimal negative margin width because the question has not been addressed in prospective

randomized trials. The observational design used in the McCahill et al study is valuable for illuminating the nature of potential quality gaps but cannot be used to inform the validity of candidate quality measures."

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