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Upgrade of high-risk breast lesions detected on mammography in the Breast Cancer Surveillance Consortium

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Papillary lesions;
Upgrade

Abstract

BACKGROUND: Upgrade rates of high-risk breast lesions after screening mammography were examined.

METHODS: The Breast Cancer Surveillance Consortium registry was used to identify all Breast Imaging Reporting and Data System category 4 assessments followed by needle biopsies with high-risk lesions. Follow-up was performed for all women.

RESULTS: High-risk lesions were found in 957 needle biopsies, with excision documented in 53%. Most (n = 685) were atypical ductal hyperplasia (ADH), 173 were lobular neoplasia, and 99 were papillary lesions. Upgrade to cancer varied with type of lesion (18% in ADH, 10% in lobular neoplasia, and 2% in papillary lesions). In premenopausal women with ADH, upgrade was associated with family history. Cancers associated with ADH were mostly (82%) ductal carcinoma in situ, and those associated with lobular neoplasia were mostly (56%) invasive. During a further 2 years of follow-up, cancer was documented in 1% of women with follow-up surgery and in 3% with no surgery.

CONCLUSIONS: Despite low rates of surgery, low rates of cancer were documented during follow-up. Benign papillary lesions diagnosed on Breast Imaging Reporting and Data System category 4 mammograms among asymptomatic women do not justify surgical excision.

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Percutaneous image-guided needle biopsies have revolutionized the management of suspicious breast imaging findings. The ability to obtain tissue from mammography, ultrasound, or magnetic resonance imaging findings enables women with benign pathology to avoid surgery, whereas those diagnosed with cancer can be planned for a definitive 1-stage surgery. However, there is 1 group of women who do not gain from this breakthrough: those diagnosed with high-risk breast lesions on needle biopsy. These lesions include atypical ductal hyperplasia (ADH), atypical lobular hyperplasia, lobular carcinoma in situ, papillary lesions (benign papilloma, atypical papillary hyperplasia), radial sclerosing lesions, and columnar lesions. Many will undergo surgery after needle biopsy to achieve a definitive diagnosis and rule out cancer. Those who are upgraded to invasive cancer may need further surgery to achieve negative margins or to stage the axilla. There is great controversy regarding the need for follow-up surgery. Multiple studies and reviews have been published on the surgical results with a wide range of upgrade rates to cancer and hence different recommendations. These reports are limited by the small numbers of women included with a mix of indications for biopsy, by the selection of women for surgery, and by a lack of imaging-pathology correlation. To complicate matters, poor interobserver variability has been reported with these lesions.[1] In addition, there is great variation in physician recommendations; in surveys of surgeons,[2] radiologists,[3] and pathologists,[4] there seemed to be more disagreement then agreement on the management of some of these lesions. This problem will only increase with the increased use of newer imaging technologies such as magnetic resonance imaging, breast tomosynthesis, and molecular breast imaging.

Large population-based studies with adequate follow-up of women who did and those who did not have surgery are needed to resolve these questions. We used data from the Breast Cancer Surveillance Consortium (BCSC) to examine the rates of upgrade of high-risk lesions in this population-based cohort.

Methods

We included data from 5 mammography registries that participate in the National Cancer Institute–funded BCSC (http://breastscreening.cancer.gov): the Carolina Mammography Registry, Group Health Cooperative in Washington, the New Hampshire Mammography Network, the New Mexico Mammography Project, and the Vermont Breast Cancer Surveillance System. These registries collect information on mammographic examinations done in their defined catchment areas. Each mammography registry annually links women in its registry to a state tumor registry or regional Surveillance, Epidemiology and End Results program that collects population-based cancer data and pathology databases that collect information on both benign and malignant diagnoses. The BCSC Statistical Coordinating Center pooled and analyzed the data. Each mammography registry and the Statistical Coordinating Center have received institutional review board approval for either active or passive consenting processes or a waiver of consent to enroll participants, link data, and perform analytic studies. All procedures comply with the Health Insurance Portability and Accountability Act, and all registries and the Statistical Coordinating Center have received federal certificates of confidentiality and other protection for the identities of women, physicians, and facilities studied by this research.

The study sample included screening mammographic examinations and short-interval follow-up examinations done between January 1, 1994, and December 31, 2007, on women aged $\geq$40 years. To avoid misclassifying diagnostic examinations as screening examinations, we excluded examinations done within 9 months of a prior breast imaging examination. Short interval follow-up examinations were defined by the indication given by the radiologist. Breast Imaging Reporting and Data System (BI-RADS) category 5 exams were excluded from the study. Mammography examinations that occurred after 2007 were not included to ensure $\geq$12 months for reporting cancers to tumor registries after the most recent mammographic examination.

A self-administered questionnaire included questions about family history of breast cancer (first-degree relative), time since previous mammography, menopausal status, and current use of postmenopausal hormone treatment. Time since previous mammography was classified as $<$1 year (9 to 11 months), 12 to 35 months, 36 to 59 months, $\geq$5 years, or no previous mammography.

Pathologic data included pathologic results for the first needle biopsy within 4 months of mammography and for all surgical biopsies (including excisional biopsies, lumpectomies, and mastectomies) done on the same side within 6 months of the needle biopsy. Fine-needle aspiration specimens were excluded.

Pathology results were classified as ADH, lobular neoplasia (atypical lobular hyperplasia, lobular carcinoma in situ), papillary lesions (intraductal papilloma, multiple papillomas), or cancer (ductal carcinoma in situ [DCIS] or invasive cancer). Papillary lesions with atypia were combined with ADH lesions. Data on papillary lesions and radial sclerosing lesions were available from 2 registries. Radial sclerosing lesions were excluded because there were too few. Because complete cancer ascertainment is available for the women in the BCSC, to determine if high-risk lesions were upgraded to cancer ($<$1 year after needle biopsy), all women, regardless of documented surgery, were included, though cancer was rare in women without follow-up surgery. Two-year and 3-year follow-up was available for 749 (78%) and 678 (71%) of the study subjects, respectively.

Cancers were classified according to their grade and American Joint Committee on Cancer 6th edition[5] stage at diagnosis. Invasive cancers were classified according to their histology.