Short-Interval Follow-Up Mammography: Are We Doing the Right Thing?

Karla Kerlikowske, Rebecca Smith-Bindman, Edward A. Sickles

The American College of Radiology Breast Imaging Reporting and Data System (BI-RADS) (1) was designed to standardize the interpretation and reporting of mammography results by providing six well-defined assessment categories and standard recommendations for follow-up. One of the six assessment categories is “probably benign – short-interval follow-up recommended” or BI-RADS 3. The creation of the BI-RADS 3 assessment category was based on two empiric observations. First, there is an identifiable class of mammography findings for which the probability of malignancy is somewhat higher (1%–2%) (2–10) than the overall cancer detection rate in a screened population (0.6%) but lower than the probability of cancer when clearly abnormal findings are present (8.5%) (11). Second, the tumor size, lymph node status, and stage of cancers found among probably benign lesions typically indicate a favorable prognosis. Because probably benign lesions have a relatively low likelihood of being malignant and because tumors found among probably benign lesions have a favorable prognosis, the American College of Radiology supports the recommendation of periodic follow-up to monitor these lesions (1). Typically, a repeat diagnostic mammography examination is suggested after 6 months to determine whether the probably benign lesion has remained stable. Lesions that have progressed require immediate biopsy, whereas those that remain stable are usually evaluated at an additional 6-month interval. If, after 1 year of observation, the probably benign lesion has still not progressed, the interval is lengthened to annual surveillance for the next 1 or 2 years. Regular screening mammography can resume if the probably benign lesion has remained stable. Periodic follow-up of lesions that have a low likelihood of being malignant averts immediate biopsy and decreases the number of women who require tissue sampling as well as the associated morbidity and cost of performing biopsies on every probably benign lesion has remained stable. Periodic follow-up examination to look for the (admittedly uncommon) more rapidly growing cancers among probably benign lesions recommended only after a full diagnostic imaging workup has been performed to establish that a lesion is of sufficiently low malignant potential that immediate biopsy is not warranted (2–5,7–9).

A short-interval follow-up recommendation made only from a screening examination may be given for lesions that represent more rapidly growing cancers that could have been identified by an initial diagnostic workup. In addition, a short-interval follow-up recommendation made only from a screening examination may be given for lesions that would have been called benign after a diagnostic imaging workup and do not require any follow-up. One study (15) reported that approximately 40% of women with probably benign assessments are given a recommendation for short-interval follow-up solely from a screening examination. Because the proportion of examinations with probably benign lesions given a short-interval follow-up recommendation solely from a screening examination is unknown in the WHI study, it is not possible to discern which lesions recommended for short-interval follow-up resulted in the 1%–2% cancer yield reported by Yasmeen et al (14).

Six months is the recommended interval for having a follow-up examination to look for the (admittedly uncommon) more rapidly growing breast cancers among probably benign lesions before they become symptomatic and grow to a more advanced stage (16–18). Yasmeen et al. (14) provide supporting evidence that this is a reasonable recommendation. A modest percentage (i.e., 37%) of cancers associated with a short-interval follow-up recommendation were discovered within 12 months of the baseline examination, and all of those cancers were early-stage (0 or I). All of the cancers were 20 millimeters or smaller in size and lymph node-negative, suggesting that most were probably identified after performing a short-interval mammography examination and that short-interval follow-up likely permitted their early detection.

The findings reported in this issue of the Journal by Yasmeen et al. (14) from the Women’s Health Initiative (WHI) study—that the frequency of breast cancer among women with probably benign lesions recommended for short-interval follow-up is 1%–2%—are consistent with what others have reported (2–10). However, the lack of information on the initial and final mammography assessments and the diagnostic workups that led to short-interval follow-up recommendations make it difficult to know what lesions were studied by Yasmeen et al. (14) and limit the potential impact of their findings on clinical practice. For example, the lack of information about whether a short-interval follow-up recommendation was made immediately after a screening examination or only after a woman had a full diagnostic imaging workup potentially allows for a mixture of very different kinds of breast lesions that are to be monitored with short-interval follow-up. On the basis of evidence reported in the peer-reviewed literature, short-interval follow-up should be recommended only after a full diagnostic imaging workup has been performed to establish that a lesion is of sufficiently low malignant potential that immediate biopsy is not warranted (2–5,7–9).
The goal of screening mammography is to detect breast cancers at an early stage, to prevent deaths from breast cancer, and to minimize the harms associated with screening healthy women. If the BI-RADS 3 assessment category and its associated recommendation for short-interval follow-up are used as intended by the American College of Radiology, for every 10,000 women screened, there would be an estimated 120 BI-RADS 3 assessments, 120 diagnostic mammography examinations of probably benign lesions performed within 6 months of the screening mammography examination, 12 biopsies, 108 biopsies averted, and one to two cancers detected at an early stage (2–5, 7–9, 17). These numbers suggest that periodic surveillance is reasonable if the prevalence of probably benign lesions is low (i.e., 1%–2%). However, if the prevalence of probably benign lesions recommended for short-interval follow-up is actually higher—5% (range = 1.2%–9.8%), as reported by Yasmeen et al. (14)—a large number of women may be undergoing unnecessary surveillance of benign lesions.

We need to better understand how radiologists use the BI-RADS 3 category in practice to make recommendations on how best to limit unnecessary periodic surveillance. Further research is required to know whether probably benign lesions can be safely characterized and followed directly from a screening examination and whether this approach maximizes the identification of early-stage breast cancers while limiting the number of women undergoing surveillance and biopsy.