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The Probably Benign Assessment

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The term "probably benign" is widely recognized and accepted in breast imaging. Earlier descriptors included "low suspicion" [1] and "minimally suspicious," [2] but, because of concern that the pejorative nature of such terms might prompt unintended biopsy, "probably benign" was substituted [3]. An assessment of probably benign is clinically helpful when used for a lesion that is not definitely benign and that can be followed safely with short-term imaging surveillance rather than biopsy. Indeed, this term has been incorporated into the Breast Imaging Reporting and Data System (BI-RADS) as assessment category 3 [4–6].

The probably benign assessment was introduced and popularized in the early 1990s, once screening mammography had become widely implemented. The major goal of screening mammography is the detection of early-stage, favorable-prognosis cancers, but to detect such cancers, false-positive biopsy recommendations are occasionally necessary. The primary rationale behind probably benign assessments is to reduce false-positive recommendations for biopsy substantially while maintaining an acceptably high detection rate of early-stage cancer. This goal is accomplished by defining as probably benign those lesions that carry a less than 2% likelihood of malignancy (lesions for which at least 50 biopsies are needed to identify one cancer) and by observing during periodic imaging surveillance that (1) these lesions demonstrate interval increase only infrequently and (2) those few lesions later found to be malignant are almost always still early-stage cancers, even though diagnosis was delayed until interval progression prompted biopsy. The costs and morbidity of false-positive biopsies thus can be reduced, enhancing the cost effectiveness and efficacy of screening mammography. Before the introduction of the probably benign assessment, the biopsy costs for mammographic abnormalities or palpable masses constituted half the total costs of screening programs [7]. The proper use of probably benign assessments can reduce

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the costs associated with false-positive biopsies and increase the positive predictive value of biopsy [2].

Robust data from diverse sources support the use of the probably benign assessment in mammography. It has stood the test of time, even after percutaneous core biopsy, with reduced cost and morbidity, was introduced as an alternative to surgical biopsy [8]. Recently BI-RADS has added probably benign assessments to the interpretation of breast ultrasound [5] and MR imaging examinations [6]. This article examines in depth the use of the probably benign assessment: which lesions should be assessed as probably benign, the published evidence supporting such use, pitfalls in misuse, and areas of potentially expanded use that currently are under investigation.

Inclusion criteria

Three types of mammographic lesions can be assessed confidently as probably benign: a circumscribed mass, clustered round (punctate) or oval calcifications, and a focal asymmetry. Additional miscellaneous types of lesions have been described as probably benign, although relatively few cases of each of these lesion types have been reported.

Mass

A mammographic mass is a space-occupying lesion, seen on at least two different mammographic projections, denser in the center than at the periphery, and characterized by convex outer margins. Ultrasound may be used to establish the diagnosis of a cyst, which is a definitively benign mass. Other than demonstrated location in the skin or depiction of internal fat, there are no characteristically benign mammographic features for a mass. Therefore, to be considered benign at mammography, a mass should have morphologic features suggestive of benignity as well as a minimum of 2-year stability [9]; the shape of the mass should be round, oval, or lobular, and its margins should be circumscribed. A probably benign mass is one that is noncalcified and circumscribed (Fig. 1) but lacks the requisite 2-year stability [3]. Not infrequently, portions of the margins of a mass are obscured by adjacent isodense fibroglandular tissue. In this circumstance, at least 75% of the margins of the mass should be deemed circumscribed to qualify as probably benign; none of the margins may be indistinct or spiculated (Fig. 2A, B). Diagnostic mammography views (such as those using spot compression with or without magnification) often can help in displacing adjacent obscuring tissues and reducing geometric blur to assist in margin assessment (see Fig. 2A, B; Fig. 3A, B) [10].

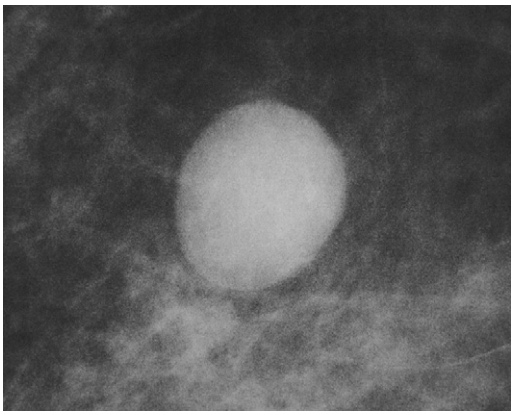

Fig. 1. Mammogram showing a circumscribed oval mass. In the absence of a suspicious sonographic correlate or sonographic demonstration of a simple cyst, this mass is associated with a probability of malignancy of less than 2%. Therefore, it may be assessed as probably benign and managed with periodic mammographic surveillance that begins with short-interval follow-up.

Calcifications

A cluster (defined as five or more particles per cubic centimeter) of tiny round or oval calcifications (Fig. 4) may be considered probably benign [3]. BI-RADS uses two descriptors for round calcifications; those tiny enough to be probably benign (< 0.5 mm) are termed "punctate," and those that are larger and more characteristically benign are simply termed "round" [4]. Spot-compression magnification mammography usually is required to provide sufficient resolution to portray the round shapes of probably benign calcifications. Note that calcifications that are amorphous in shape (Fig. 5) (too small or too indistinct to be considered round) are associated with a sufficiently high probability of malignancy (20%) that they should not be assessed as probably benign [11]. Although uncommon, tiny round calcifications that are linear or segmental in distribution also are considered suspicious (Fig. 6), based on limited anecdotal experience indicating a likelihood of malignancy substantially higher than 2%.

Focal asymmetry

A focal asymmetry is a space-occupying lesion, seen on at least two different mammographic projections, occupying less than a quadrant of the breast. It differs from a mass in that its margins are concave-outward, and it usually is seen interspersed with fat (Fig. 7A–D). In the absence of palpability or associated findings more suspicious for malignancy, as seen at fine-detail mammography or ultrasound, a focal asymmetry may be considered