Comparing BI-RADS 2013 With the 2003 Edition: Has It Worked Better?

Afsaneh Alikhassi*

*Department of Radiology, Cancer Institute, Imam Khomeini Hospital, Tehran University of Medical Sciences (TUMS), Tehran, Iran

The most recent (5th) edition of the American College of Radiology (ACR) Breast Imaging Reporting and Data System (BI-RADS) Atlas has replaced the previous one in most centers. Various texts and articles in the literature have reviewed or summarized the new edition, and some original articles have evaluated the predictive value of BI-RADS descriptors. In this commentary, we highlight some problems that we had with the new edition of BI-RADS in daily clinical practice.

We believe the changes introduced into the latest edition of the ACR Atlas can be classified into minor changes, completing changes, and major challenging changes.

Minor Changes
Minor changes can be further categorized into three groups: (1) lexical changes, such as using rim calcification instead of eggshell and lucent-centered calcification, asymmetry instead of simple asymmetry, which is mostly to make reporting easier; (2) changes in classifications, i.e., moving global asymmetry from the “special cases” category to the “asymmetries” category or taking intermammary lymph nodes out of the “special cases” category and making it an independent category; and (3) addition of new items such as simple cyst and fat necrosis to the “special cases” category. These changes are easily substituted.

Adding and Completing Data
Some new useful parts were added to the latest edition of BI-RADS, including a background on parenchymal enhancement in MRI (minimal, mild, moderate, or marked) and a new subsection on prosthesis assessment. The previously deficient parts of the BI-RADS atlas have now been completed.

Major Changes
Major changes are those that had a great impact on daily clinical practice and are as follows: (1) density description; (2) omitting the “intermediate concern” group from calcifications categories, and BI-RADS 4a; and (3) BI-RADS 3, 4, and 5 should only be used after a full imaging workup and not for mammography screening.

Density
The 2003 edition of BI-RADS used breast composition categories (ACR category 1–4) based on the overall density (%) of fibrograndular tissue as a breast cancer risk indicator. However, the ACR Committee on BI-RADS concluded that the association of breast density with the sensitivity of mammography is clinically more important than the percentage of breast density as an indicator for breast cancer risk (Figure 1). Therefore, in the 2013 edition, new breast composition categories (assigned alphabetically α–d to avoid possible confusion with the numbered BI-RADS assessment categories), have been introduced.

There is intra- and inter-observer variation in visually estimating breast density between any two adjacent density categories in both types of categorization. In a study performed in our center, substantial inter-observer agreement was seen using both the fourth and fifth editions, and the intra-observer agreement was high for both editions. The percentage of women who were classified as having dense breasts was also not statistically significant using both methods.

BI-RADS 3
Since the release of the ACR BI-RADS fifth
edition, when a patient attends our center for screening or a benign-appearing lesion, such as when an oval circumscribed mass is found, we classify it as BI-RADS 0 in the report and perform a full evaluation including targeted sonography. The authors of the BI-RADS 2013 believed that some of these patients would not need short-term follow-up mammography after a full evaluation. For example, the mass may be identified as a cyst on the targeted sonogram (Figure 2). On rare occasions, the described mass can be a solid circumscribed one on sonography with a high flow in a simultaneous color Doppler, which suggests a high-grade malignancy. Some of these lesions may have a solid oval circumference and appear to have a homogenous texture on sonography; these will obtain a classification of BI-RADS 3. In this case, the patient will be recommended to have a short-term follow-up via sonography. In palpable lesions with a BI-RADS 3 appearance on imaging, different clinicians have different approaches because of nonrobust evidence in the literature, with some preferring to order a biopsy. As mentioned in the BI-RADS edition 5, and based on our experience, persistent focal asymmetry after full evaluation and a group of punctate microcalcifications are the most prevalent mammographic BI-RADS 3 classifications that need short-term follow-up with mammography.

**BI-RADS 4 and 5**

In the previous BI-RADS edition, categories 4 and 5 could not be reported during a screening mammography. Both categories required additional images before they could be classified. However, in some imaging departments, such as our center in Iran, the screening and diagnostic wards are not separate, and the same radiologists often perform both tasks on the same day. In addition, for insurance and legal reasons, the radiologists are not supposed to take any additional images without the request of a clinician. Thus, if we encounter a suspicious or highly suspicious finding, we will assign it to BI-RADS 4 or 5 category based on the descriptors in the screening mammography. For example, if we detect a spiculated mass containing suspicious microcalcifications during a screening mammography, we assign a classification of BI-RADS 5 instead of BI-RADS 0 in the same session (Figure 3).

**Calcifications**

We believe that the most challenging changes in the BI-RADS 2013 as compared to the 2003 edition are reporting microcalcifications. The changes are as
In the 2013 edition, “lucent-centered” and “eggshell” calcifications in the “typically benign” category have been replaced by the new term “rim” for ease and simplicity.

One major change in microcalcification classifications in the 2013 edition is the omitting of the “intermediate concern” category. The three calcification types (amorphous, coarse heterogeneous, and fine pleomorphic) are grouped as “suspicious morphology,” and since their probability of malignancy is 10% to 50%, they are assigned BI-RADS 4b. Fine linear or fine linear branching calcifications are placed in category 4c or 5 depending on their distribution. The number of microcalcifications in each group is not identified, but we know that when their number increases, the probability of malignancy will increase.

Although some types of microcalcifications encountered in daily clinical practice are not mentioned, such as punctate microcalcifications with regional distribution and regionally distributed microcalcifications with some degree of pleomorphism. This may be because there is little robust data in the literature.

Heterogeneity in the density and size of microcalcifications were also not focused. For example, it is not clear which BI-RADS score should be assigned to a group of punctate microcalcifications varying in size and density (Figure 4).

In summary, the BI-RADS system has greatly improved breast imaging reporting by standardizing the reports and has made data collection for research purposes much easier, but some other important details may be considered in the future editions.

**Conflict of Interest**

None.
References


