

IMPLEMENTING THE ACR BI-RADS® –MRI LEXICON IN CLINICAL PRACTICE

As in the mammography BI-RADS® lexicon, there are sources of confusion in using the ACR BI-RADS® –MRI lexicon. Some confusion occurs because descriptors may be used more than once to describe different features of a mass. Specifically, the descriptor “IRREGULAR” is both a mass shape and a mass margin, which could conceivably result in an “irregularly shaped” mass with an “irregular margin.” For this situation, we recommend that the term “IRREGULAR” be used only once to describe the mass shape or mass margin.

Differentiation between a very large, irregular heterogeneous mass and a large heterogeneous area of regional enhancement also has been bothersome to the committee, since both terms describe abnormally enhancing large volume-occupying findings. To help in this distinction, a “MASS” should have definable margins with a separable distinct edge from the surrounding glandular tissue. In general, a “MASS” is usually composed of a pathologic process in a ball-like three-dimensional structure. On the other hand, “REGIONAL ENHANCEMENT” is not as distinct from the surrounding elements, “REGIONAL ENHANCEMENT” may represent normal or pathologic changes, depending on the character of the enhancement within the region. For example, “STIPPLED REGIONAL ENHANCEMENT” describes tiny separated dots of enhancement over a large area, suggestive of fibrocystic change within the structure of the glandular elements, displayed as tiny enhancing foci separated by islands of fat and nonenhancing glandular tissue. “REGIONAL ENHANCEMENT” can also represent abnormal pathologic processes

such as a large heterogeneously enhancing extensive breast cancer, or a wide area of “REGIONAL CLUMPED ENHANCEMENT” representing ductal carcinoma in situ (DCIS). However, even using these guidelines, categorization of large enhancing findings into “MASS” or “REGIONAL ENHANCEMENT” may still prove problematic, since one person’s large mass may be another person’s regional enhancement.

There has been confusion regarding the nouns “FOCI” or “FOCUS,” which describe a specific tiny dot or dots of enhancement that cannot otherwise be characterized, compared to the distribution descriptor “FOCAL AREA,” describing a small region of NON-MASS-LIKE abnormal enhancement. A “FOCUS” is a small isolated spot of enhancement, generally less than 5 mm in size, that is so tiny that no definitive morphologic descriptors can be applied to it, and so small that ROI dynamic data may be spurious due to partial volume averaging with surrounding normal tissue. “FOCI” describe several such tiny spots separated widely by normal tissue so that each tiny spot of enhancement can be considered a separate entity.

A “FOCAL AREA” of enhancement describes a small area of abnormal enhancement (larger than a “FOCUS”) that contains a specific characteristic morphologic enhancing pattern that can be distinguished from the surrounding normal tissue, has isolated spots of fat or normal glandular tissue within it (to distinguish it from a “MASS”), and is larger than a “FOCUS.” In general, a FOCAL AREA occupies less than 25% of a breast quadrant volume. For example, “a 1 cm FOCAL AREA of CLUMPED enhance-

ment near the chest wall” might be used to describe a small region of DCIS, whereas “a 1 cm FOCAL AREA of STIPPLED enhancement” might describe a small region of fibrocystic change.

Other questions arose regarding the terms “LINEAR,” “DUCTAL,” and “SEGMENTAL.” The term “LINEAR” describes enhancement in a line that is not definitely in a duct and cannot be otherwise characterized. On three-dimensional images, “LINEAR” enhancement described from a sagittal image might be seen to represent a sheet of enhancement that is seen as a line on the sagittal tomographic slice. “DUCTAL” enhancement describes abnormal enhancement in a linear distribution that may branch, may have smooth or irregular margins, and is pointing toward the nipple, representing enhancement in breast ducts and its branches. “DUCTAL” enhancement can best be discerned on images with enough high spatial resolution to define and separate individual ducts.

“SEGMENTAL” enhancement is enhancement in single ductal system resulting in a cone or triangular area of enhancement with its apex pointing at the nipple. “SEGMENTAL” enhancement may be seen more frequently on thicker sections, but the same process might show individual “DUCTAL” enhancement if the spatial resolution were high enough. Both “DUCTAL” and “SEGMENTAL” enhancement represent enhancement in ductal structures, how-

ever, the morphologic appearance of the ductal system on MRI depends on spatial resolution as well as the orientation of the viewing plane.

Breast MRI is a developing field, and it is expected that technical advances will allow faster temporal acquisitions and higher spatial resolution, easier acquisition of physiologic images, and new types of image display. The current ACR BI-RADS®–MRI lexicon reflects current technology, but it is to be expected that the Breast MRI lexicon will be a “living document,” that the lexicon will be continually updated and changed as new sequences and imaging techniques develop.

The ACR BI-RADS®–MRI lexicon is arranged to be used in everyday practice. Constant use of the lexicon should make it possible to issue meaningful, unambiguous breast MRI reports. As a document that is expected to change with advances in morphologic and dynamic imaging techniques, the committee welcomes any comments and/or suggestions, and requests that they be addressed in writing to the ACR.

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