

INTRODUCTION

Contrast-enhanced breast magnetic resonance imaging (MRI) has been shown to have very high sensitivity in the detection of breast cancer, particularly invasive breast cancers. Initial studies were disappointing because the high sensitivity was tempered by modest specificity, rendering this technique less than optimal for clinical use. Morphologic criteria such as lesion margin characteristics (spiculated for cancers, smooth for benign lesions) on high-spatial-resolution scans improves specificity for breast cancer without sacrificing sensitivity. Contrast-enhancement kinetics, generally showing fast initial enhancement and rapid washout in breast cancers versus continued enhancement in benign fibroadenomas, further increased specificity. Other technologies (parametric image or physiologic imaging) display high-resolution architectural features and signal intensity/time-course kinetic data on one image.

There are numerous morphologic and dynamic curve interpretation criteria for benign and malignant lesion features in the scientific literature. Imaging findings differ due to varying MRI techniques across the world. These variations in technique influence what the observer may perceive and report. This lack of consensus in describing architectural features and/or kinetic data results in major problems in consolidating data from breast MRI studies, evaluating the applicability of any one technique, and communicating findings and results to referring physicians.

As a result of similar problems in reporting breast abnormalities on mammography, the American College of Radiology (ACR) produced a mammography lexicon resulting in the Breast Imaging Reporting and Data System (BI-RADS®).

BI-RADS® provided a standard language that

could be used to compare findings across multiple scientific studies and enabled all radiologists to describe mammographic findings in a consistent manner.

In 1998, the United States Public Health Service's Office of Women's Health funded the International Working Group on Breast MRI to establish an international team of breast MRI investigators to expedite the clinical implementation and widespread dissemination of breast MRI. As part of that effort, the Lesion Diagnosis Working Group was charged with development of a breast MRI lexicon to provide a means for consensus among experts for the standardization of reporting MRI techniques and the reconciliation of terms used to describe lesion architecture and enhancement characteristics. The Lesion Diagnosis Working Group was comprised of investigators from breast imaging and breast MRI, with specialties in high-resolution scans, kinetic studies, and parametric/physiologic imaging (the latter involving the simultaneous display of kinetic enhancement characteristics superimposed on the morphology of the lesion). Similar to the effort by the ACR to produce BI-RADS®, the purpose of the MRI project was to develop a lexicon for contrast-enhanced breast MRI. Subsequent work involved development and testing for reproducibility of the MRI lexicon on case studies.

During an initial two-day session in 1998, the Lesion Diagnosis Working Group developed a preliminary ACR BI-RADS®-MRI lexicon to encompass the reporting of breast MRI scanning technique, lesion architecture, and region of interest (ROI) kinetic/time-intensity curve interpretation. The working group reviewed the breast MRI literature for architecture and ROI kinetic/

time-intensity curve descriptors used for describing cancers or benign lesions, features considered significant for lesion management, and features that would prompt specific management recommendations (biopsy or follow-up management). The lexicon included most descriptors thought to be important for lesion diagnosis and interpretation. Descriptors for lesion morphology were based loosely on architectural features described in BI-RADS®.

Between 1998 and 2002, the preliminary breast MRI lexicon was refined by the Lesion Diagnosis Working Group members and experiments were designed and performed to evaluate the reproducibility of the new breast MRI lexicon (ACR BI-RADS®–MRI). Based on data analysis of reproducibility experiments involving multiple observers, MRI images, and dynamic curves, terms were reevaluated, some sections were expanded and others were eliminated.¹ The National Cancer Institute (NCI), Susan G. Komen Foundation, United States Army Breast Cancer Research Program, United States Public Health Service’s Office of Women’s Health, and ACR funded these efforts. Subsequently, continued efforts on the breast MRI lexicon were taken over by the ACR, which was instrumental in the development and production of the ACR Breast Imaging Reporting and Data System–MRI (ACR BI-RADS®–MRI).

This edition of the ACR BI-RADS®–MRI is the final product of development and testing by the international group of MRI experts. This edition includes a section on definitions and illustrations of each morphologic feature described in the ACR BI-RADS®–MRI nomen-

clature, technical aspects of acquiring breast MRI examinations, and illustrations of dynamic curve data. The objective of the ACR BI-RADS®–MRI lexicon is to standardize the language used in breast MRI reporting, to aid clinicians in understanding the results of the breast MRI tests for subsequent patient management, and to aid scientific research by enabling investigators to compare studies based on similar breast MRI terminology.

Each of the features illustrated in the ACR BI-RADS®–MRI lexicon is described by a legend below an MRI image. Many images will show more than one feature, but the main illustrated feature will be capitalized, such as “SPICULATED rim-enhancing irregular mass.” Where possible, the pathology of the illustrated finding will be included.

Reference:

- ¹ Ikeda DM, Hylton NM, Kinkel K, et al. Development, standardization, and testing of a lexicon for reporting contrast-enhanced breast magnetic resonance imaging studies. *J Magn Reson Imaging*. 2001 Jun;13(6):889-95.