Redefining MRI:
From Image to Insight

ICMRI 2026
THE 14th INTERNATIONAL CONGRESS ON MRI
& 37th ANNUAL SCIENTIFIC MEETING OF KSMRM

AUGUST 27 - 28, 2026
Grand Walkerhill Seoul, Seoul, Korea
https://icmri.ksmrm.org/2026m

Breast 1

SY05-1

The Essentials of Breast MRI Protocols: Why We Scan and What to See

Jin Chung

Ewha Womans University Mokdong Hospital, Korea

1. Core Sequences & Essential Techniques of Breast MRI

- **Fat Suppression Techniques:** Applying fat suppression (e.g., CHESS or IR) eliminates background interference. This dramatically maximizes the contrast, allowing for the clear, unobstructed visualization of enhancing malignant lesions on post-contrast T1WI and distinctly highlighting cysts or peritumoral edema on T2WI.
- **Pre-contrast T1WI:** Essential for establishing a baseline, assessing fat suppression uniformity, and identifying signal-void biopsy clips or pre-existing high-signal areas (e.g., proteinaceous cysts, hemorrhagic cysts)
- **T2WI:** Critical for morphological characterization. Benign lesions (e.g., cysts, fibroadenomas) typically show high T2 signal. It is also useful for evaluation of peritumoral edema and nodal morphology.
- **DWI:** Malignant tumors restrict water diffusion, appearing bright on high b-value images (800 sec/mm2 recommended) and dark on ADC maps.
- **Conventional DCE-MRI:** It requires a baseline scan followed by multiple phases. Early phase imaging (60–120s) captures the rapid wash-in of contrast in tumors. Delayed phases (up to 4–8 minutes) generate kinetic curves.

2. Advanced Protocols & Post-Processing of Breast MRI

- **MIP:** It provides an immediate, global overview of bilateral breast vascularity and asymmetry. MIP is highly beneficial for the rapid visual detection of enhancing masses, evaluating multifocal or multicentric distribution at a glance, and serves as a primary diagnostic tool in ABMR reading.
- **Ultrafast MRI:** Utilizing view-sharing or compressed sensing, this technique captures the entire breast volume every 4 to 10 seconds. It captures the very early arterial inflow. Malignancies typically show a significantly steeper and earlier initial slope compared to background parenchyma or benign lesions.
- **Abbreviated MRI:** Designed to reduce scan time and cost while maintaining high sensitivity for breast cancer screening, particularly in women with dense breasts. The protocol is less than 10 minutes, typically consisting of a pre-contrast T1, a single early post-contrast T1, and T2WI. Post-processing (Subtraction and MIP images), DWI and 2nd post-contrast T1WI are useful and optional.

Keywords: *Breast MR, Sequence, DWI, Ultrafast MRI, Abbreviated MRI, Fat suppression*