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Comparison of bilateral whole-breast ultrasonography versus magnetic resonance imaging in the setting of breast cancer staging

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Objective: To compare the incremental cancer detection rate (ICDR) using bilateral whole-breast ultrasonography (BWBUS) versus dynamic contrast-enhanced magnetic resonance imaging (MRI) in patients with primary breast cancer.

Methods: A retrospective database search in a single institution identified 259 patients with breast cancer diagnosed from January 2011 through August 2014 who underwent mammography, BWBUS, and MRI before surgery. Patient characteristics, tumor characteristics, and lesions seen on each imaging modality were recorded. The sensitivity, specificity, and accuracy for each modality were calculated. ICDRs according to index tumor histology and receptor status were also evaluated. The effect of additional cancer detection on surgical planning was obtained from the medical records.

Results: A total of 266 additional lesions beyond 273 index malignancies were seen on at least one modality, of which 121 (45%) were malignant and 145 (55%) benign. MRI was significantly more sensitive than BWBUS ($p=0.01$), while BWBUS was significantly more accurate and specific than MRI ($p<0.0001$). Compared with mammography, the ICDRs using BWBUS and MRI were significantly higher for estrogen receptor-positive and triple-negative cancers, but not for human epidermal growth factor receptor-2-positive cancers. Twenty-two additional malignant lesions in 18 patients were seen on MRI only. Surgical planning remained unchanged in eight (44%) of those 18 patients.

Conclusion: MRI was more sensitive than BWBUS, while BWBUS was more accurate and specific than MRI. MRI-detected additional malignant lesions did not change surgical planning in almost half of these patients. BWBUS may be a cost-effective and practical tool in breast cancer staging.

Biography

Dr. Hongying He completed her PhD in microbiology at State University of New York at Buffalo in 2000 and her MD at Albert Einstein College of Medicine in New York City in 2005. She completed her radiology residency in the McGovern Medical School at UT Health in 2010 and her breast imaging fellowship at M.D. Anderson Cancer Center in 2011. She is currently the Chief of Breast Imaging in the Department of Diagnostic and Interventional Imaging at the McGovern Medical School. Her main research interest includes correlating imaging features of breast cancer with underlying biology and clinical outcomes.

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