Excerpta Medica

The American Journal of Surgery

The American Journal of Surgery 190 (2005) 633–640

Presentation

Pathologic correlates of false positive breast magnetic resonance imaging findings: which lesions warrant biopsy?

Samantha A. Langer, M.D.[a], Kathleen C. Horst, M.D.[b], Debra M. Ikeda, M.D.[c], Bruce L. Daniel, M.D.[c], Christina S. Kong, M.D.[d], Frederick M. Dirbas, M.D.[a,*]

[a]*Department of Surgery, Stanford Cancer Center and Stanford University School of Medicine, Stanford, CA 94305, USA*
[b]*Department of Radiation Oncology, Stanford Cancer Center and Stanford University School of Medicine, Stanford, CA 94305, USA*
[c]*Department of Radiology, Stanford Cancer Center and Stanford University School of Medicine, Stanford, CA 94305, USA*
[d]*Department of Pathology, Stanford Cancer Center and Stanford University School of Medicine, Stanford, CA 94305, USA*

Manuscript received June 5, 2005; revised manuscript June 10, 2005

Presented at the Sixth Annual Meeting of the American Society of Breast Surgeons, Los Angeles, California, March 16–20, 2005

Abstract

Background: Contrast-enhanced breast magnetic resonance imaging (MRI) is highly sensitive for breast cancer. However, adoption of breast MRI is hampered by frequent false positive (FP) findings. Though ultimately proven benign, these suspicious findings require biopsy due to abnormal morphology and/or kinetic enhancement curves that simulate malignancy on MRI. We hypothesized that analysis of a series of FP MRI findings could reveal a pattern of association between certain "suspicious" lesions and benign disease that might help avoid unnecessary biopsy of such lesions in the future.

Methods: A retrospective chart review identified women undergoing breast MRI between June 1995 and March 2002 with FP findings identified by MRI alone. Lesions were retrospectively characterized according to an MRI Breast Imaging–Reporting and Data System lexicon and matched to pathology.

Results: Twenty-two women were identified with 29 FP lesions. Morphology revealed 1 focus (3.5%), 5 masses less than 5 mm (17%), 11 masses greater than 5 mm (38%), 1 (3.5%) linear enhancement, and 11 (38%) non–mass-like enhancement. Kinetic curves were suspicious in 15 (52%). Histology demonstrated 20 (69%) variants of normal tissue and 9 (31%) benign masses. MRI lesions less than 5 mm (n = 6, 20.5%) were small, well-delineated nodules of benign breast tissue.

Conclusion: Suspicious MRI lesions less than 5 mm often represent benign breast tissue and could potentially undergo surveillance instead of biopsy. © 2005 Excerpta Medica Inc. All rights reserved.

Keywords: Breast magnetic resonance imaging; False positive breast MRI findings; MRI-guided biopsy

Contrast-enhanced breast magnetic resonance imaging (MRI) is a highly sensitive test for identifying breast carcinoma and, to a lesser extent, ductal carcinoma in situ (DCIS). Further, breast MRI is able to demonstrate malignancy invisible to clinical examination, mammography, and ultrasound. Therefore, MRI is now used in a variety of clinical settings to supplement, and in some instances to precede, more traditional methods of breast evaluation [1–3]. Principal criteria for identifying suspicious lesions with MRI are lesion morphology and enhancement kinetics.

Breast MRI is emerging as the preferred imaging study for screening women at very high risk for developing breast cancer and for women with axillary metastases with unknown primary breast lesions [2]. Nevertheless, clinical benefit in other settings is more variable. Reasons commonly cited for hesitancy in administering the test are high cost, lack of diagnostic information beyond that obtainable with a clinical breast examination and conventional imaging, and frequent false positive (FP) findings. FP findings are particularly problematic and significantly offset potential benefits from breast MRI.

FP findings prolong patient evaluation and increase pa-

* Corresponding author. Stanford Cancer Center, 875 Blake Wilbur Dr., CC2235, Stanford, CA 94305. Tel.: +1-650-723-6779; fax: +1-650-724-4137.

E-mail address: dirbas@stanford.edu

0002-9610/05/$ – see front matter © 2005 Excerpta Medica Inc. All rights reserved.
doi:10.1016/j.amjsurg.2005.06.030

tient anxiety. They also typically lead to additional imaging studies, including ultrasound and repeat MRI. Moreover, they may lead to unnecessary biopsies and, in some situations, may even lead to unnecessary mastectomies. If FP findings were reduced, MRI would be a more useful adjunctive diagnostic imaging tool.

This study retrospectively evaluated a cohort of women who had abnormalities demonstrated solely on MRI that were subsequently found to represent benign processes by surgical biopsy. Our goal was to carefully correlate these false positive MRI findings with histology. The specific aim was to define a pattern of morphologic characteristics and kinetic enhancement curves that might more accurately have predicted the benign processes that were eventually found. The hypothesis was that by analyzing a series of FP MRI findings we would be able to reveal an association between certain "suspicious" lesions based on morphology and kinetic enhancement and benign breast disease. If this were demonstrated, lesions with such MRI characteristics could potentially be approached with close surveillance rather than biopsy in the future.

Methods

Identification of patient cohort

We performed an institutional review board–approved, retrospective, chart review within a single surgeon's practice between June 1995 and March 2002 to identify women who underwent breast MRI. Once they were identified, their individual clinical breast examinations and matched imaging studies were carefully reviewed to determine the subset of women who had a breast lesion detected solely by MRI that was interpreted as suspicious but was later proven to represent benign histology by surgical biopsy. These defined our FP findings.

Once this cohort was identified, histories were reviewed in detail for chief complaint, physical findings, results from any and all breast imaging studies, diagnostic procedures, surgical pathology, and clinical follow-up. The more detailed review allowed us to confirm that women in the study group had a likely benign ipsilateral clinical breast examination, standard 2-view screening or diagnostic mammography, and focused ultrasound (if performed) with MRI alone responsible for identifying a suspect lesion. Because our intent was to determine the full clinical impact of administering breast MRI, women were also included in the study even if the MRI suggested a benign finding and the patient requested a biopsy of this previously occult lesion. Biopsy results were carefully reviewed to confirm the absence of atypical hyperplasia, carcinoma-in-situ (CIS), or other suspicious/malignant findings to exclude women whose MRI-guided biopsy results might have altered management recommendations, such as initiation of tamoxifen.

MRI

MRI was performed in a 1.5-T scanner (Echospeed; GE Medical Systems, Milwaukee, WI). All images were obtained in the prone position. Since the study spanned a 7-year period, there were slight alterations in equipment and technique. Examinations were performed with non-phased array surface coil (Medrad, Pittsburgh, PA), and with a phased array breast coil (MRI Devices, Waukesha, WI). Whole breast rapid dynamic MR images and high-spatial-resolution fat-nulled MR images were contemporaneously acquired by using a combination of dynamic 3-dimensional (3D) spiral MRI to obtain initial kinetic enhancement curves during the wash-in phase of gadolinium (GD) contrast. Intravenous GD (Gadoteridol, Bracco Diagnostics, Princeton, NY or Magnevist, Berlex, Berlin, Germany) at a dose of 0.1 mmol/kg was infused as a rapid bolus at a rate of 2 to 3 mL/s using a power injector (Spectris, Medrad). Immediately following this injection, high-spatial-resolution transfer (3DSSMT) imaging was done to collect information regarding morphology followed by additional dynamic 3D spiral MRI to obtain delayed kinetic enhancement curves.

All MRI scans in this report were performed prior to the development of a standardized reporting system. Accordingly, it was necessary to retrospectively review all MRI scans and classify lesions using a standardized lexicon. We used a modification of the recently developed, American College of Radiology (ACR) MRI Breast Imaging–Reporting and Data System (BI-RADS) lexicon [4]. MRI findings were retrospectively classified into 5 morphologic subtypes: foci (entities <2 mm), masses less than 5 mm, masses ≥ 5 mm, linear enhancement, and non–mass-like enhancement. Kinetic enhancement curves were coded based on initial and delayed enhancement patterns. These curves were classified as highly suspicious (rapid initial uptake with washout or plateau), indeterminate suspicion (rapid initial uptake with sustained late phase), or low suspicion (slow uptake with a persistent late phase).

At a minimum, each patient discussed the suspicious findings seen on breast MRI with their surgeon (F.M.D.). Other members of each patient's health care team participated in this decision making process to a greater or lesser degree. In the early part of the study period, an MRI wire-localized surgical biopsy was the initial management recommendation for lesions interpreted as indeterminate or suspicious by radiologists specializing in breast MRI. During the latter part of the study period, we recommended that suspicious MRI lesions be evaluated with focused ultrasound prior to MRI-guided wire-localized biopsy. Others have shown that focused ultrasound can often identify discrete MRI lesions [5]. These can then be managed more expeditiously with ultrasound-guided percutaneous biopsy or ultrasound-guided wire localization biopsy. Women in the current study had lesions that were not seen on ultrasound and, accordingly, were encouraged to pursue MRI-

Download English Version:

https://daneshyari.com/en/article/10101191

Download Persian Version:

https://daneshyari.com/article/10101191

Daneshyari.com