The Role of MRI in the Workup of Mammographic Architectural Distortion

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Synopsis
Mammographic evaluation of architectural distortion can be frustrating. A review of 57 patients sent for contrast-enhanced breast MRI after indeteminate mammography showed that 25% of patients had cancer. MRI correctly classified 13 of 14 cancers and 33 of 43 benign lesions. In 10 of 57 patients, followup studies (6 - mammography; 4 - MRI) were recommended due to slow Gd-DTPA uptake specific to the area of concern. One of these studies resulted in a diagnosis of cancer 18 months after MRI. We conclude that MRI can reliably aid in the workup of architectural distortion.

Purpose
Mammographic management of architectural distortion can be challenging and frustrating as this finding may be subtle and is sometimes seen on only a single projection. In such situations, biopsy may be falsely negative and diagnosis delayed. We reviewed seven years of breast MRI to determine how MRI helped manage architectural distortion.

Patients and Methods
Between 1/1/95 and 8/9/02 552 patients had breast MRI - 96 underwent MRI to evaluate architectural distortion. MRI was performed at 1.5 T with dynamic contrast-enhanced imaging having a temporal resolution of 30 seconds. Slice thickness varied from 1.2 - 2.0 mm and in-plane resolution was 0.625 mm^2 during static and 0.625 x 1.25 mm during dynamic imaging. Depending on morphology and Gd-DTPA uptake/washout, MRI diagnosis was classified into three groups: malignant (suspicious morphology, rapid uptake, with or without washout), needs follow-up (slow uptake specific to the area of mammographic concern, no washout) and benign (no differential uptake). For patients who underwent biopsy the pathological report established the diagnosis. An MRI study was classified as false negative if a cancer diagnosis was made within 24 months of the initial study. For patients who did not undergo biopsy or further imaging studies, a true negative was assigned if: (a) follow-up mammography > 12 months after MRI showed no change, or resolution of the finding; or (b) the patient had clinical follow-up (e.g. clinic or ER visit) >36 months after MRI, and did not have clinical signs of breast cancer.

Results
Of 96 patients imaged for mammographic architectural distortion, follow-up criteria were satisfied in 57: 14 with cancer and 43 without cancer. MRI correctly classified 13 of 14 cancers on first imaging and the remaining cancer after recommended follow-up mammography. MRI correctly classified 24 of 43 benign findings on first imaging and 9 benign findings after follow-up studies. A six-month follow-up study was recommended in 10 patients: by MRI in 4 cases and by mammography in 6 cases. In 9 of these 10 cases, final diagnosis was benign, and for one case, mammography diagnosed a 3 mm invasive ductal cancer 18 months after MRI. There were 10 false positive results: eight were biopsied, revealing combinations of mastitis, fibrosis, sclerosing adenosis and fibrocystic change. Of the two cases not biopsied, follow-up mammography was stable 22 and 27 months after MRI.

Conclusion
Cancer was diagnosed in 25% of cases sent to MRI after inconsistent mammographic characterization of architectural distorion. Incorporating breast MRI into the imaging algorithm can significantly alleviate the frustration associated with the mammographic workup. MRI correctly diagnosed 33 of 43 cases without cancer while leading to a correct diagnosis in all 14 cases with cancer (13 immediately, and one as the result of changes on a recommended follow-up mammogram). When isolated Gd-DTPA uptake coincides with architectural distortion, even in the absence of rapid Gadolinium contrast uptake and washout, close follow-up is recommended, either by MRI or mammography.