

## MRI-guided needle localization of suspicious breast lesions: Results of a freehand technique

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### *Purpose*

Magnetic resonance imaging (MRI) can detect clinically and mammographically occult breast lesions.<sup>1</sup> Several techniques have been developed to allow localization and selective tissue sampling of these lesions.<sup>2-4</sup> In this study we report the results of MRI-guided preoperative needle localization by using a freehand technique in a 0.5-T open magnet.

### *Materials and methods*

Preoperative MRI-guided single needle localization was performed in 220 patients with 304 breast lesions at our hospital between January 1997 and July 2004. All localization procedures were performed in an open 0.5-T Signa-SP imager, with the patient in prone position by using a phased array breast coil.<sup>5</sup> In all patients MRI compatible hookwires were placed in a non-compressed breast by using a freehand technique. MRI findings were correlated with pathology and follow-up

### *Results*

MRI-guided needle localization was performed for a single lesion in 150 patients, for two lesions in 56 patients, and for three lesions in 14 patients. Histopathologic analysis of these 304 lesions showed 104 (34%) malignant lesions, 51 (17%) high risk lesions, and 149 (49%) benign lesions. Of the 104 malignant lesions, 38 (37%) were invasive carcinoma (22 invasive ductal carcinoma, 8 infiltrating lobular carcinoma, 5 tubular carcinoma, and 3 B-cell lymphoma), 36 (35%) were pure ductal carcinoma in situ (DCIS), and 30 (28%) were a combination of in situ and infiltrating carcinoma. Of the 51 high risk lesions, 22 (43%) were intraductal papilloma, 14 (28%) were atypical ductal hyperplasia, 11 (21%) were radial scar, and 4 (8%) were lobular carcinoma in situ (LCIS). Of the 149 benign lesions, 120 (81%) were focal fibrocystic change, 14 (9%) were fibroadenoma, 10 (7%) were sclerosing adenosis, and 5 (3%) were lymph node. The overall lesion size ranged from 2.0-65.0mm (mean 8.4mm). The positive predictive value of MRI-guided freehand needle localization technique was 34%. No direct complications occurred. Follow-up MRI showed that 2 (0.7%) lesions were missed by surgical biopsy.

### *Conclusion*

MRI-guided freehand needle localization is simple and accurate, with a positive predictive value (34%) comparable to that reported for MRI-guided localization techniques that use a grid. Another advantage of the freehand technique compared to grid localization is the ability to localize lesions in the anterior breast, the axillary region and near the chest wall.

### *References*

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