Preoperative localization and biopsy of exclusively MRI detectable breast lesions: Experiences with 103 patients

Corinna Gorriz, Markus Müller-Schimpfle, Katja C. Siegmann, Nikos Fersis, Jochen Vogel, Claus D. Claussen

Dept. of Radiology, University of Tübingen, Hoppe-Seyler-Str. 3, D-72076 Tübingen, Germany; corinna@gorriz.de

RATIONALE AND OBJECTIVES:
To evaluate the diagnostic benefit of MR-guided localization and biopsy of suspicious breast lesions in comparison to the prediction of contrast enhanced dynamic MR-mammography (MRM) alone.

METHODS:
118 exclusively MRI detectable breast lesions of 103 patients (age: 25 to 80 years, mean age: 50) were histologically proven by excisional biopsy after MR-guided marking (n=89) or MR-guided microbiopsy (n=29). The interventional imaging was performed at 1 T (n=108) or 0.2 T (n=10). Lesion localization was carried out with an MR compatible metal coil (n=50) or a hook wire (n=39). Microbiopsies were performed with 14 G-high-speed biopsy systems. Prior to the interventional MRI every patient underwent diagnostic dynamic contrast-enhanced MRI of the breast (0.16 mmol Gd-DTPA/kg bw, double breast coil) by means of a T1w FLASH 3D-sequence. Different lesion characteristics (size, shape, margin, pattern of contrast enhancement) and BI-RADSTM-analogous categories depending on the degree of suspicion (3=probably benign, 4=suspicious, 5=highly suggestive of malignancy) were investigated by analysis of diagnostic MRI. Specificity and sensitivity of the contrast enhanced MRI were calculated and the relation between distinct lesion parameters and malignancy is discussed.

RESULTS:
The specificity of contrast enhanced dynamic MRM to detect a malignant lesion in this study was 23.7% (28 carcinomas of 118 lesions in total). 24 of the carcinomas were invasive and 4 carcinoma in situ. None of the malignant lesions were evaluated false negative in the initial MRM (BI-RADS 3). All carcinomas were correctly diagnosed in the initial MRM (BI-RADS 4 or 5). 76.3% of the lesions showed a benign histopathology, of which MRM revealed false positive results in 90% (79 cases BI-RADS 4, 2 cases BI-RADS 5). PPV of small (<10 mm) and larger lesions (>10 mm) is 21.4% (9/42) respectively 39.3% (11/28). Sharp lesion margins predict more often malignancy (48%; 12/25) than fuzzy lesion margins (26.9%; 7/26). PPV of round/oval and irregular shape is 31.3% (5/16) respectively 40% (14/35). 20% (5/25) of late homogenous enhancing and 53.8% (14/26) of late inhomogenous enhancing lesions are malignant. Early homogenous enhancing lesions are more frequently malignant (42.9%; 6/14) than early inhomogenous enhancing lesions (35.1%; 13/37).

CONCLUSION:
Due to the deficient specificity of MRM alone, which is concordant with reports of other authors [1-3], MRI-guided preoperative localization and biopsy is an indispensable diagnostic tool for differentiating suspicious breast lesions.

KEY WORDS:
contrast enhanced MR-mammography, interventional MRI, breast lesions

REFERENCES: