

## Contrast-enhanced magnetic resonance mammography (MRM): improvement in breast lesion detection and characterization with gadobenate dimeglumine (Gd-BOPTA) compared to gadopentate dimeglumine (Gd-DTPA)

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**Purpose:** To prospectively and intra-individually compare equivalent 0.1 mmol/kg doses of gadobenate dimeglumine (Gd-BOPTA) and gadopentetate dimeglumine (Gd-DTPA) for accuracy of detection and characterization of breast lesions on contrast-enhanced MR mammography (MRM).

**Materials and Methods:** Fifty-six consecutive women with one or more suspected breast tumors on conventional x-ray mammography and sonography underwent two identical CE-MRM examinations at 1.5T separated by 48-72h. A T1w 3D gradient-echo sequence was used and images were acquired before and at 2,4,6,8 and 10 minutes after injection of either Gd-DTPA or Gd-BOPTA at an identical flow rate of 2 ml/s. Separate and combined assessment of non-enhanced, enhanced and subtracted images was performed blindly by two readers in consensus. The accuracy for lesion detection was determined against final diagnosis, based on findings from conventional mammography, sonography and surgery. The sensitivity, specificity, positive and negative predictive values (PPV and NPV, respectively), and overall accuracy for malignant lesion identification was determined against histology. Data were analyzed using McNemar's test, proportional odds models and analysis of variance.

**Results:** Gd-BOPTA-enhanced MRM detected significantly ( $p=0.003$ ) more lesions (66/76) than Gd-DTPA-enhanced MRM (56/66) and detected lesions were significantly more conspicuous with Gd-BOPTA. Confidence for lesion characterization was significantly ( $p=0.031$ ) greater with

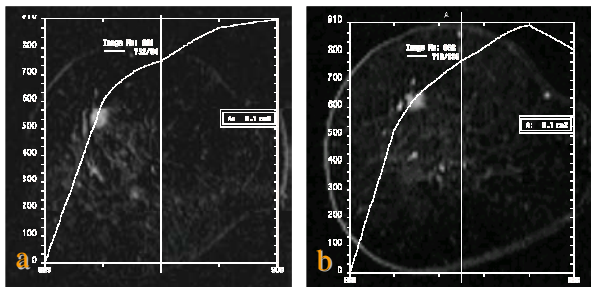


Fig. 2: MR examination with **Gd-DTPA**: irregular shaped lesion with a type I IS/T curve (a). MR examination with **Gd-BOPTA**: irregular shaped lesion with a type III IS/T curve, suspicious for a malignant lesion (b).

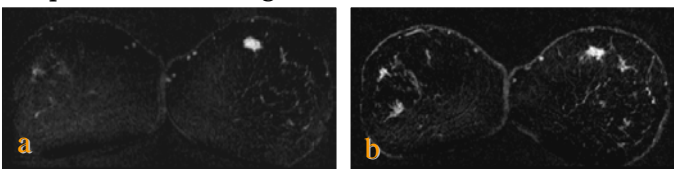


Fig. 3: MR examination with **Gd-DTPA**: an enhancing lesion in the left breast (a). MR with **Gd-BOPTA**: confirmed the presence of the lesion in the left breast and showed the presence of other 2 enhancing lesions in the contralateral breast (b).

**Conclusion:** Gd-BOPTA is significantly better than Gd-DTPA for the detection of breast lesions and for the accurate identification of malignant breast lesions. Gd-BOPTA could be used in breast cancer screening procedures.