The usefulness of high temporal resolution breast MRI sequences

Utilité des séquences à haute résolution temporelle en IRM mammaire

Breast MRI bears and even more important role in the characterization of breast lesions [1-3]. However, its high negative predictive value can be hampered by background parenchymal enhancement (BPE), masking breast lesions. We report on the case of a 39 years old patient referred upon discovery of a suspicious lesion in the lower outer quadrant (LOQ) of the left breast. Despite being scheduled with optimal timing on the 8th day of the menstrual cycle, the breast MRI exam with typical sequences showed marked BPE (figure 1). It was impossible to single out any lesion from within the LOQ of the left breast. We performed high temporal resolution dynamic sequences (TWIST®) within the first minute after administration of intravenous contrast (acquisition time per sequence: 8 seconds). Analysis of these sequences allowed us to depict an 8 mm mass within the LOQ of the left breast bearing an intense enhancement, distinguishing it from the BPE (figure 2). A needle core biopsy of the lesion was performed as follow up and yielded a lobular invasive carcinoma.

Discussion

This case highlights the usefulness of new sequences in breast MRI. It would have been impossible to unmask the cancerous lesion in this patient without the help of the high temporal resolution sequences. In the same manner that suspicious lesions can be obscured on a mammogram by dense fibroglandular tissue, BPE does not allow for affirmative conclusions to be drawn on the presence or absence of a suspicious lesion. In such cases, breast MRI fails to uphold its high negative predictive value. Given their lower acquisition times (5 to 10 seconds) [4] compared to more classical sequences (90 seconds), these novel high temporal resolution sequences allow for dynamic contrast-enhanced acquisitions at much earlier phases of tumoral enhancement where malignant lesions are known to display earlier enhancement than benign lesions. International and French national guidelines along with the BI-RADS lexicon of the American College of Radiology [5] recommend assessment of late enhancement at 7 minutes and of the wash out as the parameters for distinguishing malignant from benign lesions. Mann et al. [4] demonstrated that though the analysis of enhancement patterns within the first minute after administration of IV contrast was not possible due to the prolonged acquisition times, it was as discriminating as the assessment of kinetic curves. This would lead to shorter exam times and greater specificity than with the shortened protocols [6] presently under assessment. Furthermore, like in the case reported here, sensitivity would be increased when faced with complex diagnostic situations in the setting of background parenchymal enhancement.

Disclosure of interest: the authors declare that they have no competing interest.

References
