The American College of Radiology recently introduced a classification for lesions detected by MRM (adapted from the mammographic BI-RADS classification) [11] in five classes: BI-RADS I = negative finding, BI-RADS II = benign finding, BI-RADS III = probably benign finding, BI-RADS IV = suspicious finding, and BI-RADS V = a finding highly suggestive of malignancy.

The Fischer score was accordingly converted into the MRM-BI-RADS score of the American College of Radiology, as follows: Fischer 0, 1 = BI-RADS I; Fischer 2 = BI-RADS II; Fischer 3 = BI-RADS III; Fischer 4 and Fischer 5 = BI-RADS IV; Fischer 6, Fischer 7 and Fischer 8 = BI-RADS V.

MRI findings were compared either with histological findings, if the patient underwent biopsy or surgery, or with a 36-month follow-up with the usual imaging modalities (ultrasound and/or mammography), if the patient did not undergo any biopsy or surgery.

Statistical analysis

True-positive, true-negative, false-positive and false-negative cases were recorded as follows. True-positive cases were patients with histological signs of disease within 3 months after the MRM indicating the lesion as suspicious for recurrence. True-negative cases were patients with negative findings at MRM who had negative findings at ultrasonography and/or mammography during the following 36-month follow-up. False-positive cases were patients who underwent biopsy or surgery because MRM indicated an enhancing lesion as suspicious for malignancy but histological findings and follow-up examinations were negative for malignancies. False-negative cases were patients who underwent biopsy or surgery within 3 months after a negative MRM, because of clinical, ultrasound or mammographic findings suspicious for recurrence. These patients were considered false negative at MRM if histological examination demonstrated the presence of cancer.

The sensitivity, specificity, positive predictive value and negative predictive value and the accuracy of MRM in the detection of recurrent disease on the surgical scar were calculated. The same values, with 95% confidence intervals relating to the sensitivity and specificity, were calculated for the lesions detected in areas not related to the scar, in order to define the overall accuracy of MRM in the detection of new breast cancer lesions.

Results

Ninety-three patients (mean age, 53.3 years; range, 40–72 years) were evaluated in the present study: 40 patients had conservative surgery on the right breast, and 53 patients had conservative surgery on the left breast. Follow-up evaluation after surgery included mammography for all 93 patients and ultrasound for 74 patients. Recurrence was suspected by mammography in 27 patients (15 patients graded as mammographic BI-RADS III, 12 patients graded as BI-RADS IV), by ultrasound in 58 patients (30 patients graded as US BI-RADS III, 28 patients graded as BI-RADS IV), and by both examinations in eight patients (one patient graded as both mammographic and ultrasound BI-RADS III, two patients graded as ultrasound BI-RADS III and mammographic BI-RADS IV, three patients graded as ultrasound BI-RADS IV and mammographic BI-RADS III, two patients graded as both ultrasound and mammographic BI-RADS IV).

The mean time of follow-up after MRM, performed with mammography, ultrasonography or both examinations, was 36 months (range, 12–48 months). The mean age of patients at the time of new diagnosis was 52 years.

MRM findings were confirmed by histological findings in 29 patients and by follow-up imaging modalities (ultrasound and/or mammography) in 64 patients.

The 93 lesions studied by MRM on the surgical scar, evaluated according to the Fischer criteria, included 59 lesions graded as Fischer 0, two lesions graded as Fischer 1, eight lesions graded as Fischer 2, eight lesions graded as Fischer 3, 12 lesions graded as Fischer 4, no lesions graded as Fischer 5, four lesions graded as Fischer 6, and no lesions graded as Fischer 7 and Fischer 8. The same lesions subsequently classified into the magnetic resonance BI-RADS classification were: 61 lesions graded as BI-RADS I, eight lesions graded as BI-RADS II, eight lesions graded as BI-RADS III, 12 lesions graded as BI-RADS IV, and four lesions graded as BI-RADS V (Table 1).

In the evaluation of enhancing lesions on the surgical scar, nine lesions were true-positive cases. All of these lesions were confirmed positive by histological examination. In these cases, malignancy was suspected by ultrasound alone in five cases (three cases of BI-RADS III, two cases of BI-RADS IV), by mammography alone in two cases (both graded as mammographic BI-RADS IV), and by both examinations in two cases (one case graded as mammographic BI-RADS IV and ultrasound BI-RADS III, one case graded as both mammographic and ultrasound BI-RADS IV). Histological proof of malignancy was obtained with a vacuum-assisted breast biopsy in four patients, with a tru-cut biopsy in three cases, with fine-needle aspiration cytology in one case, and with fine-needle aspiration cytology + tru-cut in one case. Four out of nine patients underwent a complete mastectomy, 2/9 underwent a second conservative treatment (quadrantectomy), 1/9 died without undergoing further surgery (histological confirmation of recurrence came from biopsy), and the remaining 2/9 underwent surgery in other institutions – we received the pathological report without a detailed description of the type of surgery. Histological types of the true-positive cases were 8/9 infiltrating ductal carcinoma and 1/9 cribriform infiltrating carcinoma.