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BREAST IMAGING

ORIGINAL ARTICLE

Advanced MRI findings in patients with breast hamartomas

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PURPOSE
Although it has been stated that breast hamartomas are rare tumors, radiologists frequently encounter them in their daily practices. Fat, glandular and fibrous tissues all produce a mass of disorganized but mature specialized cells. Because hamartomas do not have specific diagnostic histological features, the clinical and radiological findings are important in their diagnosis. The aim of this study is to present the advanced magnetic resonance imaging (MRI) findings of breast hamartomas.

MATERIALS AND METHODS
Eight patients with breast hamartomas were examined using MRI techniques in addition to ultrasonographic and/or mammographic findings.

RESULTS
Each of the lesions examined showed a gradual enhancement pattern in its time-signal intensity curve on dynamic contrast-enhanced MRI. On MR spectroscopy, water and lipid peaks were detected that resembled normal breast tissue. The diffusion features of the lesions were variable due to the different ratios of the tissue elements constituting them on diffusion-weighted imaging (DWI).

CONCLUSION
Advanced MRI findings may clarify diagnoses by providing additional information following sonography, especially in lactating or pregnant women, in whom mammographic examination is not preferred.

Key words: • *breast* • *hamartoma* • *magnetic resonance imaging* • *diffusion magnetic resonance imaging* • *magnetic resonance spectroscopy*

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Although classical textbooks state that hamartomas are rare tumors, radiologists who use both mammography and ultrasonography (US) frequently encounter hamartomas in their daily practices. These tumors present as painless and mobile masses with well-defined borders. They are composed of variable amounts of glandular tissue, fat and fibrous elements that produce a mass of disorganized but mature specialized cells or tissues (1–3). The complete resemblance of the tissues to normal breast parenchyma and an occasional admixture of other elements limit the contribution of the pathological examination to the diagnosis. The correlation between clinical and radiological findings is of paramount importance (4, 5). Although mammographic and US findings of breast hamartomas have been well defined, advanced magnetic resonance imaging (MRI) findings in such cases have not been previously described. This study provides a description of dynamic contrast-enhanced MRI (DCE-MRI), diffusion-weighted imaging (DWI) and MR spectroscopy (MRS) findings in breast hamartomas.

Materials and methods

The study was executed retrospectively based on the records of our breast imaging center over a 24-month period. During that time, all examinations were performed by the same radiologist (G.E.), who is a specialist in breast imaging. Eight patients with a diagnosis of breast hamartoma were found in the center's registry. The ages of these patients ranged from 22 to 54 years (mean age, 38.6 years; SD, 14.6 years). These patients were initially examined with US and/or mammography either as part of a routine screening or as a work-up for palpable breast masses. Cases in which the masses were diagnosed as hamartomas were further examined via MRI. These patients each underwent an MRI examination to reveal advanced imaging characteristics of these rare lesions as part of an institutional research study on DCE-MRI, DWI and MRS. Informed consent was obtained from all patients. MRI scans were conducted using a 1.5 T scanner (Intera Master, Gyroscan, Philips, The Netherlands) with a gradient force of 32 mT/m. Images were obtained in the prone position using a standard breast coil.

Axial and sagittal T1-weighted (TR/TE, 550/11 ms), T2-weighted (TR/TE, 2429/120 ms), and fat-suppressed T1-weighted images were obtained for conventional MRI examinations. DCE-MRI was performed after intravenous administration of 0.1 mmol/kg gadopentetate dimeglumine (Gd-DTPA) with an automatic injector (Spectris, Medrad, USA). In this study, 12 consecutive T1-weighted fast field echo (FFE) sequences, each lasting 20 seconds, were obtained in four minutes. After subtracting the initial unenhanced images from the remaining enhanced images, the regions of interest (ROIs) were placed on the most enhancing area within the mass. Time intensity curves (TICs) were constructed to quantitative-