Don’t Get Scared but Be Aware: Focal Fibrocystic Changes

Eduarda Castelo Branco Araujo Bernal¹, MD, Guilherme Wilson Otaviano Garcia Chaves¹, MD, Isabella dos Santos Alves¹, MD, Carolina Rossi Saccarelli¹, MD, Danúbia Ariane de Andrade³, MD, Claudia Costa Leite, MD, PhD¹,² and Marcos Fernando Lima Docema, MD, PhD¹*

¹Department of Radiology, Hospital Sírio-Libanês, São Paulo, Brazil.
²Instituto de Radiologia (INRAD)-HCFMUSP, São Paulo, Brazil.
³Department of Mastology, Hospital Sírio-Libanês, São Paulo, Brazil.


Abstract

Breast focal fibrocystic changes (FCC) are a rare form of fibrocystic breast disease and a benign condition that may be present as a non-mass enhancement (NME) in magnetic resonance imaging (MRI) due to an inflammatory process caused by cyst fluid extravasation to surrounding tissues. This enhancement can mimic a malignant lesion, especially if not correlated to a cystic area detected on T2-weighted image (T2WI) in the enhancement site. In this study, we aim to describe the imaging characteristics of FCC, that is a benign lesion, Breast Imaging Reporting and Data System category 2 (BI-RADS 2), through analysis of T2WI and post-contrast sequences, to illustrate how a simple cyst or clustered microcysts on T2WI image may be found in the NME area allowing the diagnosis of FCC.

Keywords

Focal fibrocystic changes, Multiple cysts, Magnetic resonance imaging, Benign lesion.

Introduction

Breast fibrocystic changes (FCC) are a common finding, affecting over half of women between 20 and 50 years-old [1]. The breast tissue hormonal monthly changes of estrogen and progesterone levels are probably associated with FCC pathogenesis [2].

Breast FCC is a rare form of fibrocystic changes and can occasionally appear as a focal lesion that can mimic a tumor on imaging [3,4]. Currently, breast magnetic resonance imaging (MRI) is increasingly been used in the diagnostic routine and it is an important tool to recognize this benign condition, in order to avoid unnecessary biopsies [1,5].

Dynamic contrast-enhanced MRI (DCE-MRI) of the breast has a high specificity for breast cancer detection and can help in the differentiation of suspicious lesions seen on ultrasound (US) and mammography [6]. Breast background parenchymal enhancement (BPE) on post-contrast T1-weighted images is commonly diffuse and symmetric, ranging in degrees from minimal, mild and moderate to mark. However, it may sometimes raise doubts about its benignity, especially when it is asymmetric, focal or if it presents regional heterogeneity. In this setting, the radiologist should consider whether the enhancing area represents focal BPE or non-mass enhancement (NME), either benign or suspicious [7]. An alternative to minimize this confounding factor is to perform breast MRI during the second week of the menstrual cycle, because transiently asymmetric enhancements are usually seen during the second half of menstrual cycle [8].

Discussion

NME in breast MRI refers to lesions with abnormal enhancement, and ill-defined margins without mass effect [9]. The distribution of non-mass-like enhancement is defined on BI-RADS lexicon as focal, linear, segmental, regional, multiple regions, or diffuse. Internal enhancement patterns of NME are described as homogeneous, heterogeneous, clumped or clustered ring [10].

NME with linear or segmental distribution with any internal enhancement patterns should be considered suspicious. However, a benign condition such as breast FCC may present as NME on
MRI, mimicking suspicious malignant enhancement. Thus, it is important to recognize FCC imaging features, as well as to know the pathophysiology, clinical and epidemiological characteristics associated with the disease. For better understanding we created a flowchart to recognize breast FCC (Figure 1).

![Flowchart to recognize FCC](image)

**Figure 1:** Flowchart to recognize FCC. When there is an asymmetric NME on MRI, we need to look the distribution, and if it is segmental, there is suspicion of malignancy. Asymmetric NME without segmental distribution is doubtful if there are suspicious calcifications on mammography. Discarding this possibility, to characterize the NME as FCC, a benign lesion (ACR BI-RADS 2), we have to look for multiple clusters of cysts, best seen on T2WI.
Case 3
A 39-year-old woman with right breast pain. DCE-MRI showed NME with regional distribution (Figure 6), associated with clustered microcysts and simple cysts, characterizing FCC, classified as ACR BI-RADS Category 2 (Figure 7).

Case 4
A 35-year-old woman mammography with architectural distortion of the mammary parenchyma in the upper outer quadrant of the left breast, with associated grouped pleomorphic calcifications, in correspondence with US showing an irregular mass with spiculated margins. Classified as ACR BI-RADS Category 4. Patient underwent biopsy; the result was ductal carcinoma in situ (DCIS). The DCE-MRI showed NME with regional distribution associated with clustered microcysts and simple cysts, compatible with FCC. Another NME was seen, but with segmental distribution, corresponding to the pre-established diagnosis of DCIS (Figure 8).

Conclusion
The fibrocystic breast disease is a spectrum of benign alterations, and the most common finding is the presence of simple cysts and clustered microcysts. Breast FCC is a rare form of fibrocystic breast disease that presents as NME in DCE-MRI associated with clustered microcysts on T2-weighted images, and its recognition as a benign condition is important, avoiding pitfalls and unnecessary biopsies.
Figure 7: DCE-MRI T1WI after intravenous contrast and post-processed subtraction image and STIR showing NME with regional distribution (yellow circle) in upper inner quadrant of the right breast, associated with clustered microcysts and simple cysts (yellow arrow), characterizing a FCC, classified as ACR BI-RADS Category 2.

Figure 8: DCE-MRI T1WI after intravenous contrast and post-processed subtraction image and STIR showing NME with regional distribution (red arrowhead) in upper outer quadrant of the left breast, associated with clustered microcysts and simple cysts (red arrowhead), characterizing a FCC. Adjacent to this area, we see NME with segmental distribution (red arrow), that is, suspect, and with a pre-established diagnosis of DCIS. Sagittal images show better the segmental distribution of the NME, characterizing a suspicious distribution.

References