

CASE STUDY

Advances in Magnetic Resonance Images from Breast (MRIB), as promising method at the diagnosis



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Introduction

Breast is a modified sweat gland, constituted of glandular part, fat, and fibrous elements. The gland is the noble part, also called parenchyma, composed by ducts and wolves. The fat involves the entire breast, and it is divided into anterior adipose layer and posterior adipose layer. The fibrous elements sustain the breast, and for this, it surrounds and crossing the gland. (Fig. 1)

Usually, the adult woman's breast occupies a larger area of the thorax than that it is noticed at the surface anatomy. The gland can stretch out until the armpit region, what it represents an anatomic variation.¹

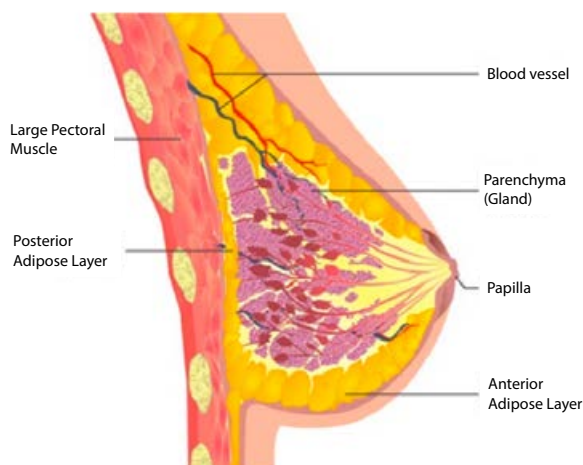


Figure 1 Anatomical structure of Breast¹

Breast cancer is a heterogeneous disease, being the second most common cancer in the world and the most frequent among women.²

It is also, the most frequent cause of cancer death among women, accounting for 13% of all female cancer deaths worldwide. It is estimated, in Brazil, in 2020, approximately 66.280 new cases of breast cancer.³

The early diagnosis is fundamental to stop the natural history of the disease, contributing to the diminution of mortality.

Mammography is the consecrated imaging method for mass screening of breast cancer, demonstrated by prospective, randomized, controlled studies. Despite frequent debates around mammographic tracking, there is no doubt that this represents one of the greatest achievements of our century.

Breast ultrasonography is an important auxiliar of mammography, especially at the dense breast. Demonstrates good rate of breast cancer detection, but with many false positives, that does not permit its utilization as tracking method.

In 1986, the Breast Magnetic Resonance Imaging (BMRI) was used for the first time in a breast study and, from then on, this method has been passed by significant advances, showing itself promising at the breast cancer investigation⁴.

When compared with the methods that are used to detect breast cancer, magnetic resonance offers new information related to the capacity of functional study, and not only morphologic.

Magnetic resonance imaging of the breast (BMRI) is a complement method noninvasive of breast propaedeutic, that has been passing through various advances in the last decades, making it is possible its use at the detection and breast cancer diagnosis. Various studies demonstrate that magnetic resonance imaging can contribute with morphological information similar from mammography at the maligns neoplasm lesions invasive, allowing however, at the post-contrast dynamic study the exploration at the beginning of the neoangiogenesis and the tumoral growth, promoting early diagnosis, additional focus evaluation of cancer, extension evaluation from lesion and contralateral breast.

Magnetic resonance imaging is the method more sensitive for invasive cancer detecting of the breast and today, present several specifics and well-established indications, as screening for women high risk, the occult cancer assessment, the preoperative staging, and the response assessment to neoadjuvant chemotherapy.⁵

Magnetic Resonance Imaging presents high sensibility and does not use ionizing radiation and it uses intravenous contrast-media. It is necessary that the equipment

parameters are adjusted to allow the best quality imaging. In addition, as the mammography and the ultrasound, are necessary important care to obtain a good study. During exam performing, as at the mammography, is necessary an excellent positioning of the breast in its specific coil. Important also, the explanation to the patient about the importance of remaining more immobile as possible during the examination and transmit security to her to reduce the anxiety. These cautions, the comprehension of anatomy and breast physiopathology and the knowledge of other images methods, form the basis for a promising study.

Canon Medical Systems do Brasil through the partnership with great names from radiology, follow the valuation of high image quality and the to prove the philosophy "Made for life". At Mama Imagem Clinic, through the Vantage Elan 1.5T equipment, the magnetic resonance from breast, demonstrates as promising method in early diagnosis. In this document we will demonstrate case with great image quality and important diagnosis.

Breast Magnetic Resonance Clinical Cases (BMR):

Case 1: Multiple coalescent nodules

Ovals nodules, hypertensive in T2 (Fig. 2), with peripheral highlight and the surroundings tissue, coalescing, measuring together approximately 5.0 × 4.0 × 4.4 cm (LL × AP × CC) localized at the inferolateral quadrant of right breast. Lymph nodes measuring until 1 cm, with discreetly thickened cortical, at the right auxiliar region. (Fig. 3-5)

Histopathology: granulomatous lobular mastitis.

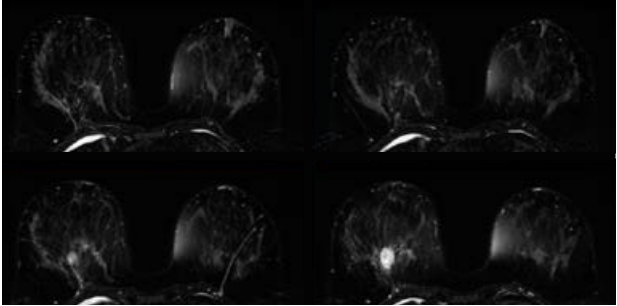


Figure 2 Axial T2 with fat suppression

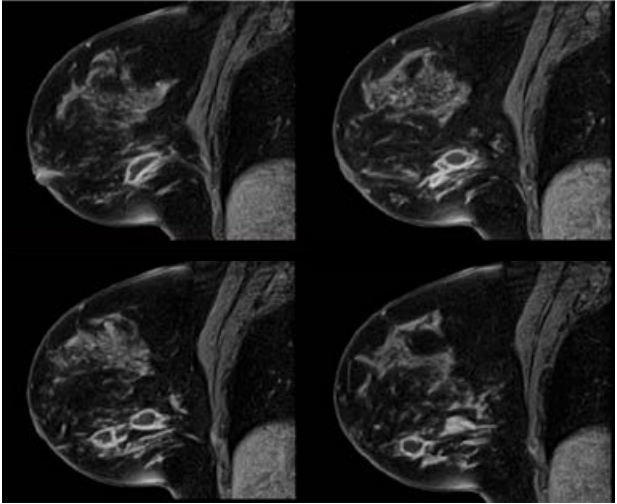


Figure 3 Sagittal 3D high resolution, Right Breast

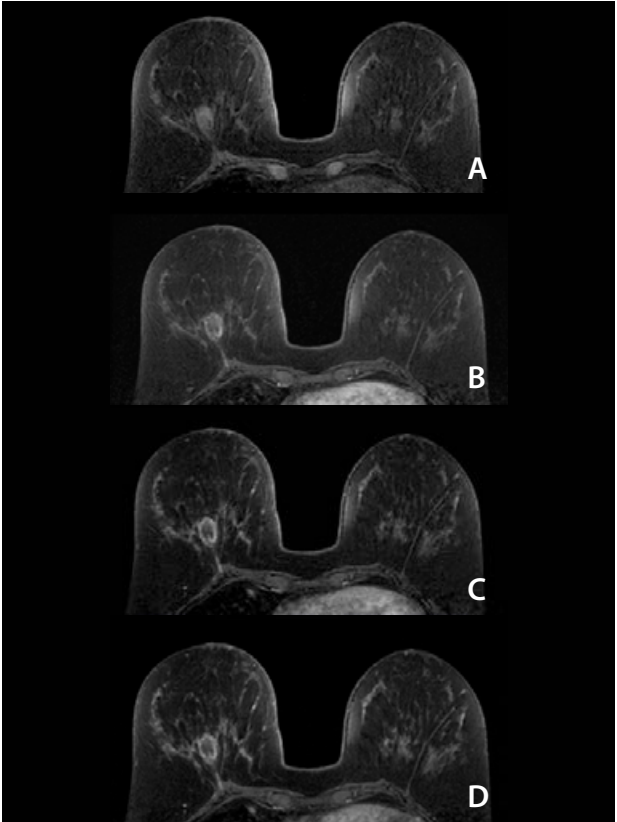


Figure 4 Dynamic Axial (4 phases):
A=pre phase, B=1ª post phase,
C=2ª post phase, D=3ª post phase

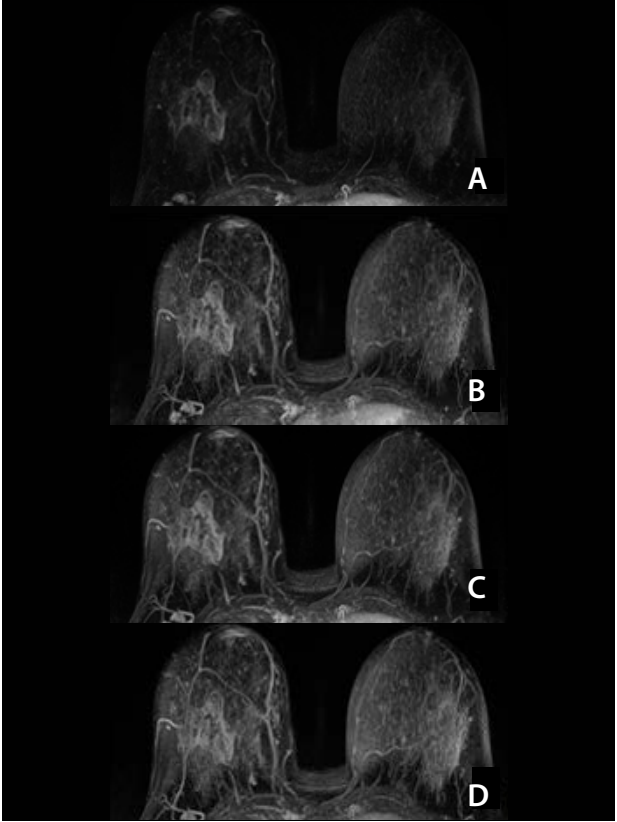


Figure 5 Axial MIP of the Dynamics Series:
A=1ª post phase, B=2ª post phase,
C=3ª post phase, D=4ª post phase

Case 2: Non-mass lesion

Highlight area non nodular heterogeneous (Fig. 6, 7), of the segmental distribution, at the inferolateral quadrant / junction of the inferior quadrant of right breast, measuring approximately 3,3 cm x 2,3 cm x 3,4 cm (LL x AP x CC), corresponding the architectural distortion area seen at the mammography and determining thickening and skin retraction. This lesion presented kinetic curve type 2 (plateau). (Fig. 8-9)

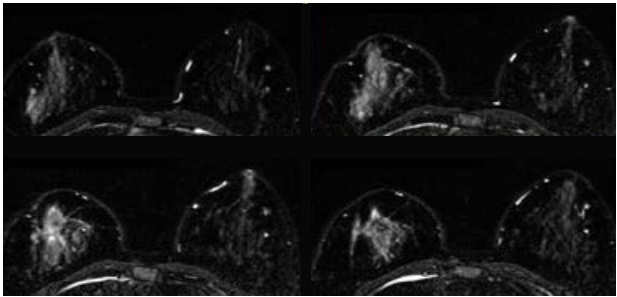


Figure 6 Axial T2 with fat suppression

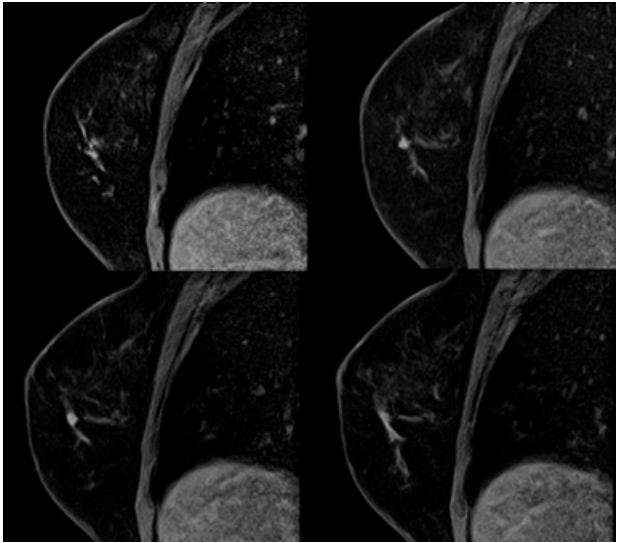


Figure 7 Sagittal 3D high resolution, right breast

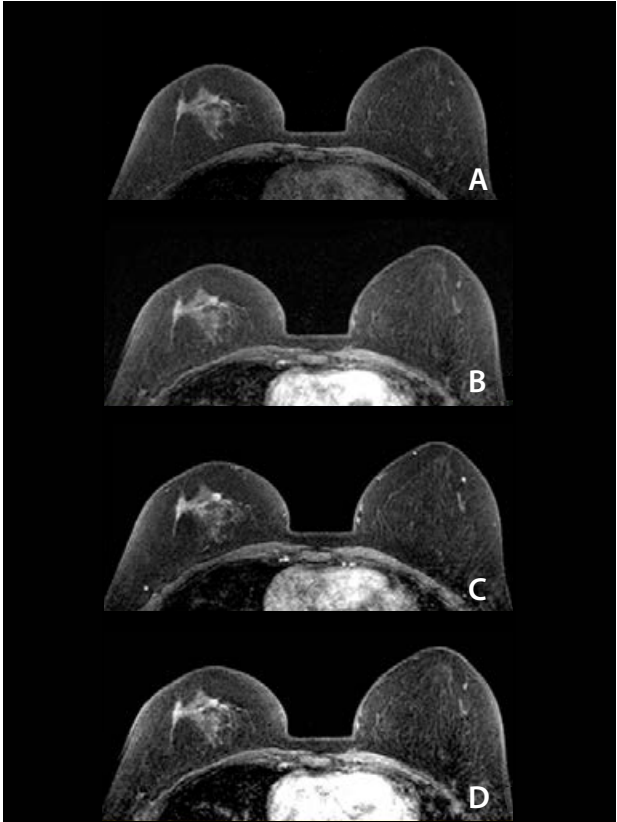


Figure 8 Dynamic Axial (4 phases):
A=Pre phase, B=1° post phase,
C=2° post phase, D=3 post phase

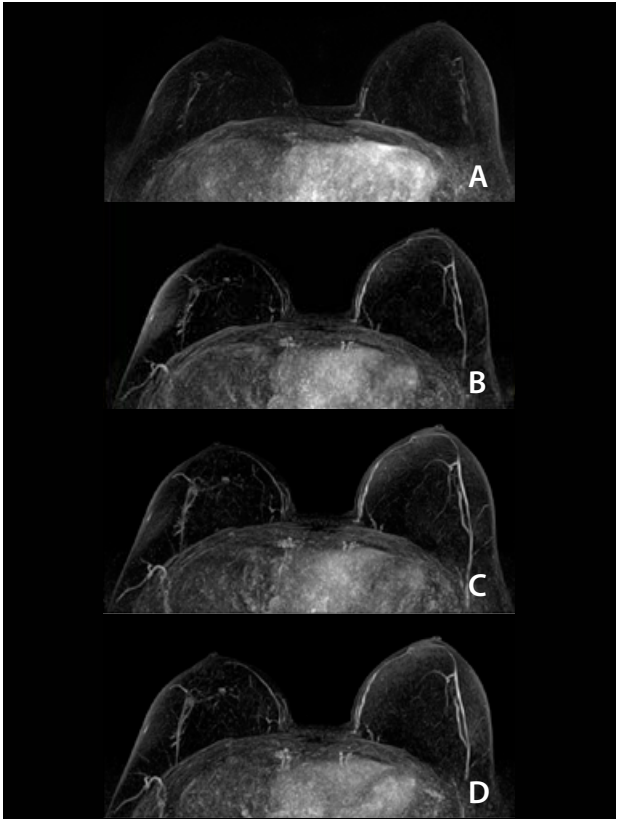


Figure 9 Axial MIP of Dynamic Series:
A=1a post phase, B=2a post phase,
C=3a post phase, D=4a post phase

Case 3: Malignant Suspicious Nodule

Nodule with form and irregular border, internal highlight heterogenous and Kinetic curve type III, measuring approximately 1,8 cm x 2,1 cm x 1,9 cm (LL x AP x CC), localized on the inferomedial quadrant of the left breast. (Fig. 10-13)

Nodule with morphological characteristics and pharmacokinetics suspect of malignity. Histopathology: invasive carcinoma SOE.

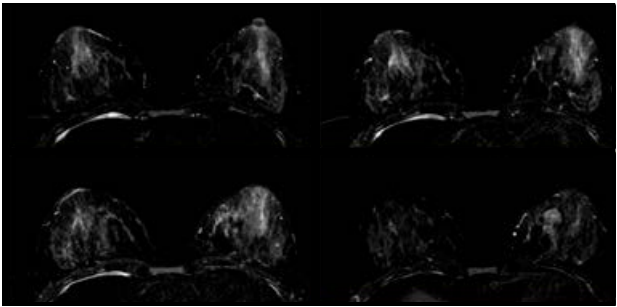


Figure 10 Axial T2 with fat saturation

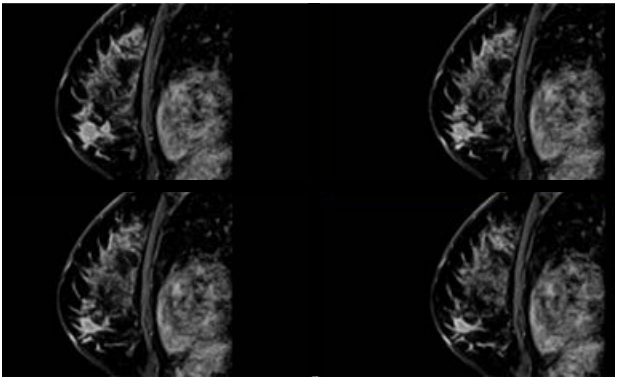


Figure 11 Sagittal 3D high resolution, Left Breast

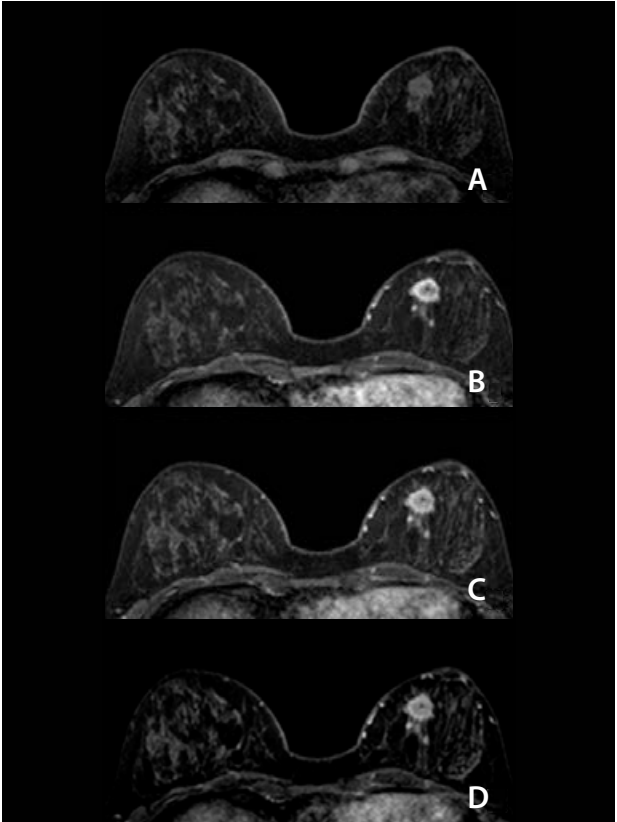


Figure 12 Dynamic Axial (4 phases):
A=pre phase, B=1° post phase,
C=2° post phase, D=3° post phase

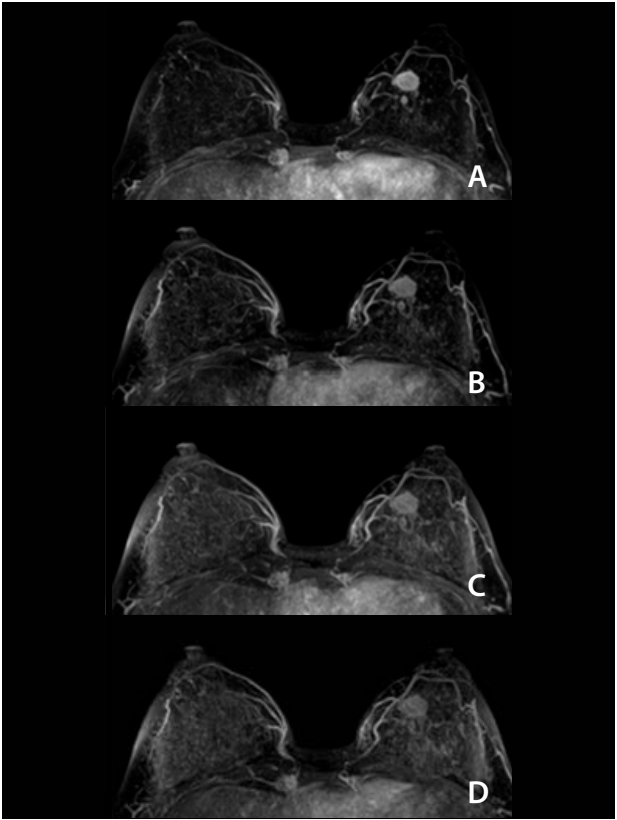


Figure 13 Axial MIP of Dynamic series:
A=1° post phase, B=2° post phase,
C=3° post phase, D=4° post phase

Conclusion

The success of magnetic resonance is linked to the technological advances and human quality at the application this technology. With this, the conquer of trustworthiness on the diagnosis, with effort of all involved, has been growing, increasing the importance of magnetic resonance at the scenario of the breast.

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