



SUSPICIOUS LOOKING BENIGN BREAST LESIONS

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ABSTRACT Benign breast lesions can mimic carcinoma in diagnostic imaging. Most of the lesions found during breast imaging exams are benign. Many of them have a clearcut and definite appearance on mammography and ultrasound, and require no further evaluation. However, some benign lesions are challenging to differentiate from carcinomas, given their suspicious and less specific radiological features. Radiologists should be aware of the imaging characteristics of these lesions and include them in the differential diagnosis of a malignant-appearing finding.

KEYWORDS : Benign lesion. Breast. Mammography. Ultrasound.

INTRODUCTION-

Most clinical breast lesions are benign and can be appropriately characterized by imaging studies. In addition, the introduction of BIRADS classification for mammography, ultrasound (US) and magnetic resonance imaging (MRI) reports has made it possible to assign a predictive value of malignancy according to well-established morphological criteria. When a lesion is detected, features such as irregular shape and spiculated margins on mammography, or posterior acoustic shadow and angular margins, predominant vertical diameter on ultrasonography (US) have a high level of suspicion for malignancy. However, there are benign lesions that may have these imaging features. These lesions include radial scar , fat necrosis , diabetic mastopathy , sclerosing adenosis - granular cell tumor . All cases will require further mammography, ultrasound, MRI projections or different types of biopsy to arrive at a definite diagnosis. These findings together with the patient's history will allow for an appropriate management of the patient. Some of these lesions, though benign, require surgery, while others only require follow-up after diagnosis. Radiological correlation is essential to analyze this group of lesions and to define their management and follow-up. We try to summarize few such problematic lesions that can make diagnosis challenging.

Radial Scar (RS) is a benign lesion of spiculated appearance, indistinguishable from carcinoma at imaging studies. From the pathologic viewpoint, it is part of a group of lesions commonly referred to complex sclerosing lesions. It has a fibroelastotic core towards which varying degrees of adenosis and fibrocystic changes converge (1). It has been reported that 28% of radial scars larger than 1 cm were associated with tubular carcinomas, ductal carcinoma in situ or other variants of invasive carcinoma [2]. When there is suspicion of radial scar, the appropriate approach is surgical biopsy, as it is necessary to evaluate the entire lesion in order to rule out a coexisting carcinoma. Mammography typically shows an area of distortion with long spicules radiating from a radiolucent centre (Figure 1). On US, it may appear as an area of distortion with posterior acoustic shadowing (Figure 2) with or without a mass. [3]. The presence of a radiolucent centre in a spiculated lesion should not lead to ruling out carcinoma, as they have similar mammographic features.

Fat Necrosis (FN) is a benign inflammatory process that occurs secondary to trauma or surgery and may mimic carcinoma on or imaging. FN may be seen following percutaneous biopsy, blunt trauma, surgeries such as lumpectomy, reduction mammoplasty, breast reconstruction, implant removal as well as in patients with no evident history of trauma [6]. It may also appear as an asymptomatic finding in a screening mammography. The mammographic appearance includes a postoperative oil cyst with or without peripheral calcifications (Fig. 3), nodular opacity, asymmetrical density, skin and subcutaneous tissue thickening, dystrophic / pleomorphic microcalcifications simulating intraductal carcinoma [6-8]. The US appearance ranges from cystic lesions with echoes, small irregular mural vegetations to ill-defined nodules, with or without posterior acoustic shadowing or nodules of irregular shape [7-9]. Since these lesions of spiculated borders and irregular shape mimic malignancy this leads to fine-needle aspiration biopsies. (Fig. 4) On MRI, fat necrosis has varying appearances depending on the stage of development and on the degree of fibrosis. Lesions are usually hyperintense on T1 because of their fat

content, and their enhancement may be identical to that of carcinoma [10], with a peripheral irregular enhancement. The presence and degree of enhancement depend on the intensity of the associated inflammatory process; with the amount of enhancement being larger in the early phase of the inflammatory process.

Cysticercosis in human is an infection caused by the larvae of *Taenia solium*. They can affect any part of the body, the most common sites being the brain, cerebrospinal fluid, muscle, and the subcutaneous tissues or eye. Cysticercosis of the breast is rare, in spite of this it should be considered as a differential diagnosis for a lump in the breast especially in the areas that are endemic. Due to the rarity of the disease, there is no detailed description of the mammographic or ultrasonographic appearances of breast cysticercosis. Vijayaraghavan described different types of sonographic appearances for soft tissue cysticercosis [11]. These are: 1) well-defined round cyst within a collection, with a brightly echogenic protrusion from the wall; 2) loculated collection of fluid with internal echoes with a well-defined round cyst within, with an eccentric echogenic protrusion from the wall, representing the scolex; 3) irregular cyst. (Figure 5). Clinically, it may mimic a breast tumour. Imaging features are helpful in pre-operative diagnosis. Definitive diagnosis is possible after the histological examination of the parasite [12].

Tuberculosis -

Breast tuberculosis may be primary where the breast lesion is the only manifestation of the disease or it may be secondary in which a focus of tuberculosis has already been diagnosed elsewhere and the disease later appears in the breast [13]. The method of spread to the breast is by the hematogenous or lymphatic routes or by direct extension from adjacent tissues. The disease presents in three forms: nodular, sclerosing and diffuse [13]. The nodular form is characterised by slow growing caseating lesion and presents as a dense round area with indistinct margins on mammography. The diffuse form consists of multiple, intercommunicating foci of tuberculosis within the breast, which may caseate leading to ulceration and numerous discharging sinuses. Skin thickening may be present along with tenderness. In addition to the breast lesion, the axillary lymph nodes are frequently affected. In the sclerosing form, excessive fibrosis rather than caseation is the main feature. Progress is slow and suppuration is rarely seen. The entire breast becomes hard because of the dense fibrous tissue and there is associated nipple retraction. Increased density of the gland is seen on mammography. All the three forms of the disease are indistinguishable from breast cancer on imaging.

In the nodular form of the disease which is more common and the lesions were either hypoechoic with ill-defined margins or complex cystic. (Figure 6). In cases of diffuse tuberculosis, ill-defined hypoechoic masses were the predominant imaging finding. In patients with sclerosing tuberculosis, increased echogenicity of the breast parenchyma was seen with no definite mass. Sonography helps in characterizing the lesions better, especially in patients with dense parenchyma. US guided FNAC decreases the failure rate and obviates the need for multiple punctures. [14]. Another interesting and underestimated inflammatory condition is granulomatous mastitis, which may be due to chronic infections, for example tuberculosis as presented below. Mammary tuberculosis is a diagnosis of exclusion in

the setting of granulomatous mastitis. This entity is more likely in high-risk populations in endemic areas and can present as a dense collection or complex cystic lesion . The commonest presentation is unilateral mass with an underlying chronic inflammatory process. The diagnosis is made on microscopic examination in the setting of a multidisciplinary approach and treatment is principally by pharmacotherapy. Most importantly, multiple repeat biopsies or open excision biopsy should be avoided due to the risk of sinus tract formation.[14]

CONCLUSION -

Radiologists should be familiar with the imaging features of benign lesions which, because of their appearance, may mimic carcinoma in diagnostic tests. Knowledge of these benign lesions will enable radiologists to suggest an adequate diagnostic and follow-up algorithm, so that unnecessary invasive procedures may be avoided in many cases.

Figure Captions

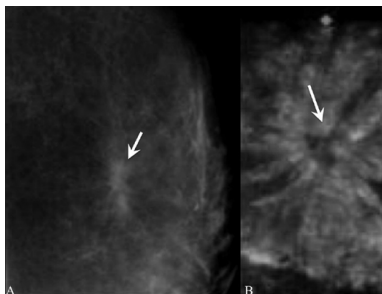


Figure 1 – Mammogram showed an ill-defined, density in the left superior quadrant

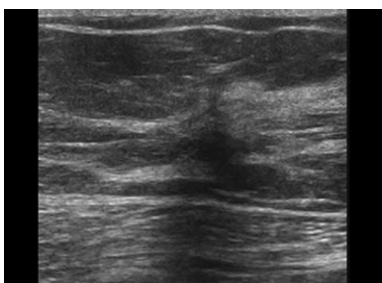


Figure 2 –Ultrasound showing spiculated lesion with posterior shadowing in a case of radial scar.

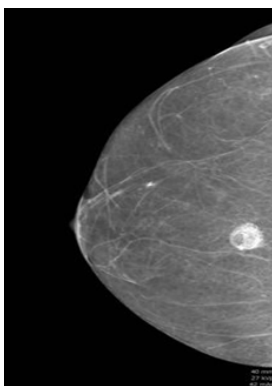


Figure 3 –Craniocaudal view showing round radiodensity suggestive of fat necrosis



Figure 4 – Ultrasound showing an oil cyst (arrow), completely anechoic on USG with peripheral calcifications (arrowheads) showing posterior shadowing



Figure 5 – Ultrasound revealed a cyst with an echogenic scolex within suggestive of cystercercosis.



Figure 6 –Ultrasound showing a spiculated mass lesion in the retroareolar region (black arrows)

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