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Radiological Mammographic and Sonographic Features of Idiopathic Granulomatous Mastitis

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Background: Idiopathic granulomatous mastitis (IGM) is a rare disease of the breast that can clinically and radiologically mimic cancer and result in unnecessary mastectomies.

Objective: To describe the radiological mammographic and ultrasonographic features of IGM, and to correlate the imaging appearances and histopathological diagnoses.

Design: A retrospective study.

Setting: Radiology Department, King Hussein Medical Centre, Amman, Jordan.

Method: The study was conducted between January 1st 2002 and December 31st 2007. Mammograms and breast ultrasounds of 13 symptomatic female patients with histopathologically proven diagnoses of IGM were reviewed. All the patients underwent fine-needle aspiration and excisional biopsy. The radiological features and histopathological diagnoses were compared.

Result: Mammography showed focal asymmetrical densities with no distinct margins in 7 patients; ill-defined masses with speculated margins in 3; large focal asymmetrical densities with small well defined mass in 2, and a large diffuse opacity involving the entire dense breast in 1. Breast ultrasound showed tubular hypoechoic lesions in 7 patients; irregular hypoechoic mass with tubular connections in 3; decreased parenchymal echogenicity and acoustic shadowing at the site of the palpable mass in 2, and no abnormality in 1.

Conclusion: Radiological mammographic and sonographic features could suggest the possibility of IGM, and may aid in the differentiation between IGM and breast cancer. However, a histological confirmation is still required for the proper diagnosis and determination of an appropriate treatment.

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Idiopathic granulomatous mastitis (IGM), granulomatous lobular mastitis, or granulomatous lobulitis is a rare benign chronic inflammatory disease of the breast that can clinically and radiologically mimic breast cancer[1,2,3]. IGM was first described by Kessler and Wolloch in 1972, and further elaborated by Cohen in 1977[4,5]. IGM is characterized by the presence of chronic granulomatous inflammation of the lobules without caseous necrosis. IGM has no obvious etiology and it is postulated to be an autoimmune localized response to retained and extravasated fat-and-protein-rich secretions in the ducts[6]. It tends to occur in a relatively younger age group, and usually develops within 6 years after pregnancy[3]. The diagnosis is based on exclusion of other causes of granulomatous breast diseases, and the presence of characteristic histological pattern[1,7].

The aim of this study is to describe the mammographic and sonographic features of IGM and to correlate the imaging appearances with the histopathological diagnoses.

METHOD

A retrospective study was conducted from January 1st, 2002 to December 31st, 2007. Medical records of 13 female patients with histopathological diagnosis of IGM were reviewed. Twelve patients were examined by both mammography and breast ultrasound (BUS), and one lactating patient underwent BUS examination only. Mammographic mediolateral oblique and craniocaudal views were obtained for each breast using Siemens Mammomat 2 Mammography Unit. Mammograms were reviewed for the presence of masses, calcifications, lymph node enlargements, and nipple and skin changes. Any detected mass was evaluated for its size, location, margins and the presence of microcalcifications. BUS was performed using 5-11 MHz linear transducer (ATL Philips HDI 5000 Ultrasound Unit) to evaluate the site, shape, outline, and internal echoes of any mass, and to observe the presence of enlarged axillary lymph nodes. Fine needle aspiration (FNA) biopsy, followed by excisional biopsy was collected from the 13 patients, and the cytological and histopathological findings were recorded respectively. Special staining for acid-fast Mycobacterium organisms, fungal elements, as well as aerobic and anaerobic bacteriological cultures was performed. The radiological appearances were described and correlated with pathological diagnosis.

RESULT

A total of 13 symptomatic female patients were reviewed. The age of patients ranged between 24 and 47 years, with a mean of 36 years. All patients were married, multiparous; however, one had recent delivery and was lactating. The patients had no previous history of systemic diseases or specific infections such as tuberculosis. None of the patients was on contraceptive pills. In 12 patients, the breast lesions developed within 6 years after the last pregnancy. The initial clinical presentations were palpable painless mass in 6 patients, palpable painful mass in 5 patients, skin redness and tenderness in 2 patients. One patient had an ipsilateral surgical drainage of breast abscess 6 months earlier. Before any imaging, the preliminary diagnosis was malignancy in 10 patients and breast abscess in 3.

All patients had unilateral disease; however, both right and left breasts were equally involved. Breast quadrants were involved in the following order; upper outer quadrant in 6 patients, lower outer quadrant in 4, and inner quadrants in 3.

Mammography showed focal asymmetrical densities with no distinct margins in 7 patients (Figure1), ill-defined masses with speculated margins in 3 (Figure 2), large focal asymmetrical densities with small well-defined mass in 2, and a large diffuse opacity involving the entire dense breast in 1 (Figure 3).

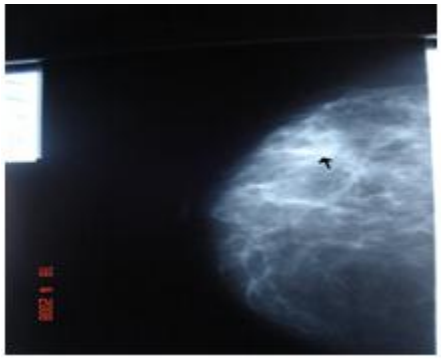

Figure 1: Craniocaudal Mammogram of Right Breast Showing Focal Asymmetric Density with Indistinct Margins

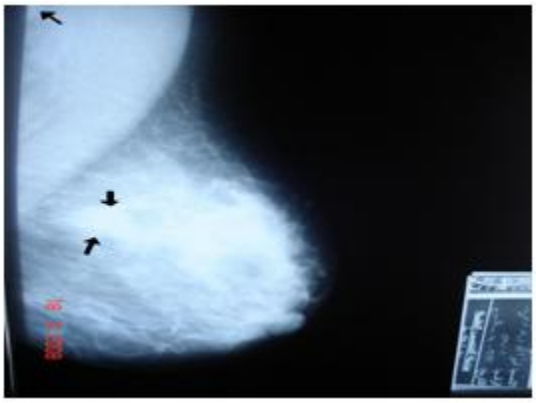

Figure 2: Mediolateral Oblique Mammogram of Left Breast Showing Ill-defined Speculated Mass in the Upper Half of the Breast with Multiple Axillary Lymph Nodes

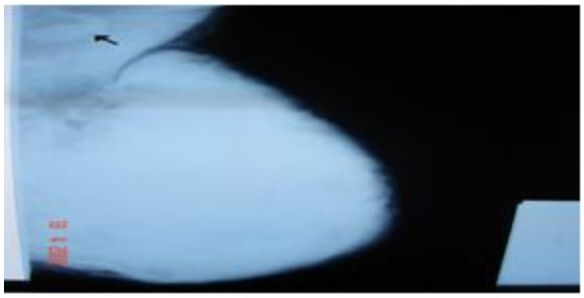

Figure 3: Mediolateral Oblique Mammogram of Left Breast Showing Diffuse Opacity Occupying the Entire Breast with Multiple Axillary Lymph Nodes

None of the lesions showed microcalcifications, or skin and nipple changes. BUS showed 2-5 tubular hypoechoic lesions in 7 patients (Figure 4), which were clustered but separate in 4 patients, and contiguous in 3.

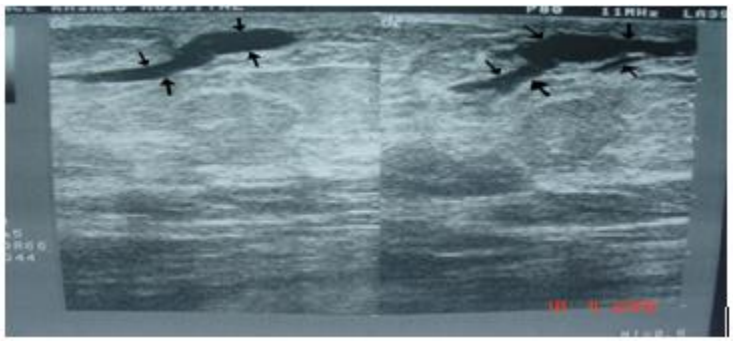

Figure 4: Breast Ultrasound Showing Tubular and Elongated Echo-free Structures

These lesions ranged from 1.0-3.0 cm in length, and 0.4-0.8cm in width. Irregular hypoechoic mass with tubular connections was seen in 3 patients. Decreased parenchymal echogenicity and acoustic shadowing at the site of the palpable mass, without discrete masses were shown in 2 patients. No sonographic abnormality was detected in 1 patient who had diffuse increased density involving the entire breast. Enlarged axillary lymph nodes were shown in 5 patients on both mammography and BUS. The cytological findings of FNA were highly cellular aspirate in 7, non-specific inflammatory lesion in 5, and suspicious of malignancy in 1. Excisional biopsy showed characteristic histopathological features of IGM. Twelve patients underwent wide local excision; however, 1 patient with suspicious result of FNA underwent mastectomy, but the final histopathology confirmed the diagnosis of IGM. The patient who had recent surgical drainage received additional steroid therapy.

DISCUSSION

IGM is a rare benign chronic inflammatory breast disease, which usually presents in young reproductive women, and associated with recent childbirth (2 months - 15 years since last delivery)[1,3,7].

The etiology of IGM is still not clear. Although no ethnic predisposition has been documented before, we have reviewed many reports from Jordan, Turkey, Saudi Arabia, Malaysia and China[6-11]. No consistent history of breast feeding or oral contraceptive pills has been associated with IGM[1,3,7]. It has been postulated that chemical reaction to contraceptives, autoimmune process as erythema nodosum, underlying infective etiology that cannot be detected by current means, and an immune response to extravasated secretions from breast lobules may represent possible etiology of IGM[7].

IGM may raise diagnostic dilemmas, as more than 50% of cases were initially mistaken for breast carcinoma resulting in increasing the rate of unnecessary mastectomies[2,7,12]. Clinically, IGM presents with breast mass, which varies in size from 0.5-9.0 cm; it is usually unilateral, and can affect any quadrant of the breast, but tends to spare the subareolar region[10,13]. In our study, 10 (77%) patients had breast lesions in the outer quadrants of the breasts, and none in subareolar region.

Mammographic features of IGM have been described infrequently. The most commonly reported mammographic findings were asymmetric density without distinct margins or mass effect, small multiple ill-defined masses with microcalcifications, and less commonly a mass with defined margins[6,13,14]. However, in dense breasts, mammography may be negative. Sonographic features of IGM have been described relatively frequently. Han et al reported multiple clustered, often contiguous, tubular hypoechoic lesions that may be associated with a hypoechoic mass[10]. Memis et al reported irregular hypoechoic mass lesions or tubular hypoechoic areas connecting to the mass[11]. In our study, the mammographic and sonographic findings were in concordance with the literature.

The FNA cytological diagnosis of IGM is difficult, and often does not deliver any diagnostic information. It might even mislead to the diagnosis of cancer[6]. However, core needle biopsy or surgical excision usually confirms the diagnosis. Histopathological features of IGM are predominantly lobular inflammatory process. IGM presents as a chronic noncaseating granulomas consisting of epithelial histiocytes and multinucleated giant cells surrounded by lymphocytes and plasma cells. Frequently the granulomas become confluent with central suppuration and liquefaction necrosis. Other causes of granulomatous mastitis such as tuberculous mastitis, fungal infection, and sarcoidosis should be excluded.

There is no ideal treatment for IGM, but wide local excision, with or without steroid therapy, is the most common method of treatment; however, with these treatments, a tendency for local recurrence and delayed healing is a posibility[1,6-8].

CONCLUSION

A correlation of mammographic and sonographic features could suggest the possibility of IGM and may aid in the differentiation between IGM and breast cancer. However, a histological confirmation is still required for the proper diagnosis and determination of an appropriate treatment.

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