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Case report

Breast granulomatosis with polyangiitis mimicking breast cancer

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Key words

Breast • Granulomatosis with polyangiitis • C-ANCA • Giant cell arteritis • Wegener's granulomatosis

Summary

Inflammatory lesions of the breast encompass primary reactive processes and local manifestation of systemic diseases. They are very rare and they are generally treated without resort to biopsy. Nevertheless they could be clinically challenge mimicking malignant process and needing surgery to reach a correct diagnosis. Here we describe a rare case of breast granulomatosis with polyangiitis, which presented with radiological and clinical alarming features that immediately raised the suspicious of malignancy leading to breast-conserving surgery.

Introduction

Granulomatosis with polyangiitis is a systemic vasculitis mainly involving lung, head and neck region and kidney, often accompanied with a positive C-ANCA test. At histology, basophilic "geographic" necrosis, inflammation with scattered darkly-stained giant cells, small-vessel vasculitis, hemorrhage and microabscess-like necrosis are variably present [1]. Breast involvement in systemic vasculitis is very rare and may occur as initial presentation or later in the course of disease [2].

Case report

In January 2010, a 46 year-old woman presented with painful swelling of the right breast. Her past medical history was unremarkable. Physical examination revealed a right movable large nodule of the central quadrant of the right breast. Breast ultrasonography evidenced a retro-areolar, hypo-echoic, irregularly shaped and partially necrotic lesion (3.7 cm across). No lymphadenopathy was appreciated in the axillary region. Cytological fine-needle aspiration and ultrasound-guided needle core biopsy revealed a yellow, creamy and purulent material characterized by numerous neutrophilic granulocytes, macrophages and scattered multinucleate giant cells. Neither fungi nor Mycobateria or Nocardia species were identified using special stains (methenamine silver and Ziehl-Neelsen stains), and the histological findings were considered most consistent with an inflammatory process of possible bacterial etiology. Microbiologic cultures were not performed. Routine laboratory tests disclosed increased erythrocyte sedimentation rate (56 mm/hr), slight anemia (Hb: 10 g/dl) and unremarkable serum tumor markers (CEA: 2ng/mL, CA 15.3: 16U/mL). Antibiotics (amoxicillin and clavulanate 1 g, 3 times/day for 6 days plus claritromicin 500mg, 2 times/day for 6 days) and non-steroidal-anti-inflammatory therapy (Ibuprofen 400 mg, 3 times/day for 10 days) were prescribed, without improvement of the breast lesion. In March 2010, a breast-ultrasonography, revealed substantial superimposable imaging features and the mass was considered entirely consistent with malignancy (BI-RADS 5) [3]. Computed-tomography (Fig. 1) confirmed the presence of ill-defined cavitated right breast mass with peripheral calcifications. The rapidly growing cystic mass of the breast was attributed to a probable high-grade carcinoma:

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Fig. 1. Chest CT-scan revealing a necrotic and ill-defined, cavitated right breast lesion.

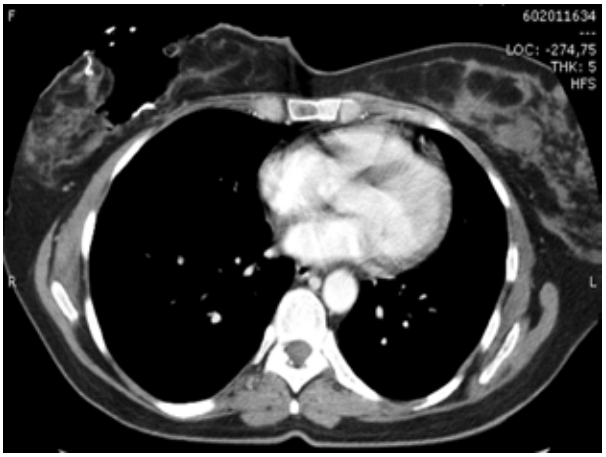


Fig. 2. Large section histologic slide showing a cavitated mass lined by an inflammatory "blue" process (Haematoxylin-eosin stain, magnification x10).

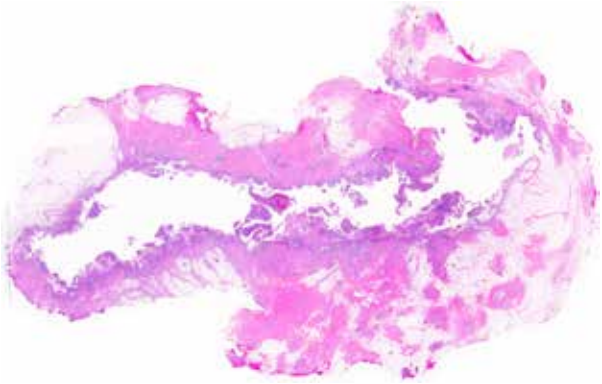


Fig. 3. Histological features of breast lesion: Breast parenchyma with irregular, serpiginous necrosis with polymorphonucleated-rich micro-abscesses (Haematoxylin eosin stain, magnification X200).

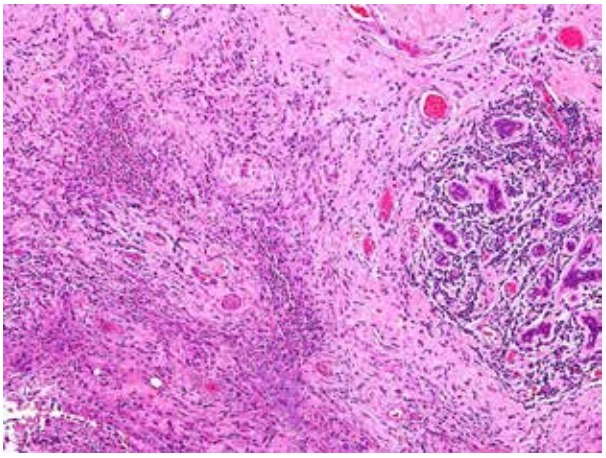


Fig. 4. Histological features of breast lesion: Multinucleated, wrinkled, darkly-stained giant cells adjacent to necrotic foci (Haematoxylin eosin stain, magnification X200).

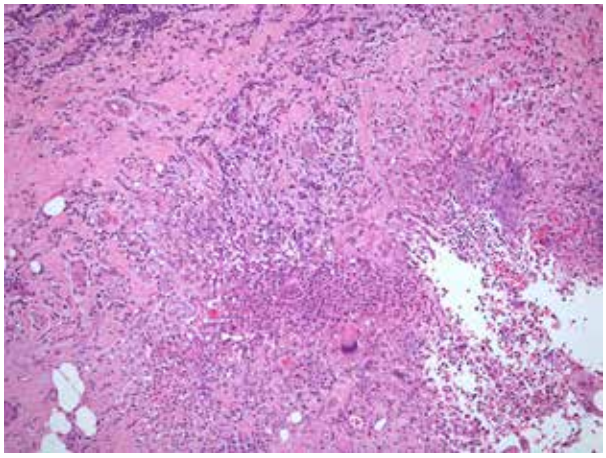
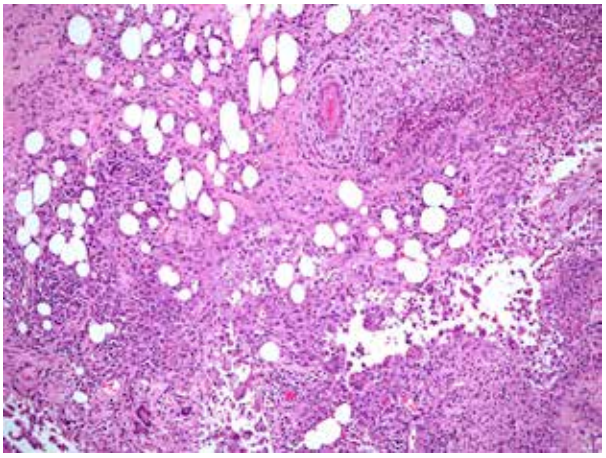


Fig. 5. Histological features of small vessel vasculitis with multinucleated giant cells and serpiginous neutrophilic necrosis defining granulomatosis with polyangitis.



sarcomatoid carcinoma or triple-negative breast cancer. No other significant abnormalities were detected in other organs. In April 2010, nipple-sparing central quadrantectomy was performed. Grossly, the surgical specimen showed a cystic lesion containing necrotic grayish material. Histological examination revealed a necrotic cavitated mass lined by a chronic inflammatory process (Fig. 2). No neoplastic or sarcomatoid cells were observed. The Inflammatory process included a necrotizing small-vessel vasculitis, scattered "wrinkled" multinucleated giant cells and serpiginous neutrophilic microabscesses (Figs. 3-4). Even on surgical specimen, no microorganisms were identified on special stains. A diagnosis of chronic granulomatous inflammation with necrosis suggesting a vasculitic disease, mainly granulomatosis with polyangiitis (formerly Wegener's granulomatosis) was performed. In May 2010, based on pathologic report, a PR3-ANCA (anti-neutrophil cytoplasmic antibody

against proteinase-3, C-ANCA) test was ordered with negative result. No further therapy was performed. In the subsequent months, the patient developed systemic symptoms (fever, malaise and weight loss), involvement of the respiratory tract (tracheo-bronchial stenosis, sinusitis), scleritis, and bilateral otitis media leading to hearing loss. In September 2010, a biopsy of crusted nasal lesions revealed a necrotizing process characterized by neutrophilic microabscesses, darkly giant cells and chondritis consistent of granulomatosis with polyangiitis involving the upper respiratory tract. Specific serum laboratory tests were repeated one month later revealing C-ANCA positivity by ELISA. Thus, a diagnosis of systemic granulomatosis with polyangiitis was made. The patient started the induction therapy with cyclophosphamide (2 mg/Kg/day) and prednisone (1 mg/kg/day) with prompt clinical response. She continued with cyclophosphamide and prednisone in the maintenance therapy for 12 months achieving a complete remission of the disease.

Commentary

Granulomatosis with polyangiitis and giant cell arteritis represent the most common systemic vasculitis manifesting as tumor-like mass even in the breast parenchyma.[3] Imaging features of a mammary ill-defined cavitated mass should then rise suspicious for vasculitis, particularly in patients experiencing constitutional symptoms such as fever, weight loss, malaise or fatigue, arthralgia and myalgia and bilateral involvement [4 5]. Although histology of granulomatosis with polyangiitis is mainly characterized by vasculitis, necrosis and inflammatory background, some of these features are lacking and the diagnosis requires a close clinico-pathologic and laboratoristic correlation. Furthermore, localized granulomatosis with polyangiitis is not infrequently associated with a negative C-ANCA serum test [3]. Nevertheless, cases of granulomatosis with polyangiitis with negative serum test and localized disease in the breast does exist and are the most difficult cases to diagnose. Indeed, the differential diagnosis includes several infections and many other inflammatory diseases (e.g., diabetic mastopathy, sarcoidosis, granulomatous mastitis, IgG4-related syndrome).

As showed here, this condition may remain silent and underscored for several months until systemic involvement with conversion to serum C-ANCA positivity occur. Awareness of atypical manifestation of granulomatosis with polyangiitis coupled to meticulous clinico-pathologic correlation may prevent unnecessary surgery.

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