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Case Report

A Case of Granulomatous Mastitis Mimicking Breast Carcinoma

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A 58-year-old woman presenting with idiopathic granulomatous mastitis mimicking breast carcinoma is described. The mass was elastic, hard and painless, and located in the upper outer quadrant of the right breast. Fine needle aspiration cytology did not provide any diagnostic information. Mammography, ultrasonography and magnetic resonance imaging (MRI) strongly suggested malignancy. Excisional biopsy was performed for definitive diagnosis, and idiopathic granulomatous mastitis was demonstrated histopathologically. Neither wound complication nor recurrence has been identified in the patient, although corticosteroids were not used post operatively. We reviewed the literature, and found that our present case is rare in older patients, and that mammography, ultrasonography and MRI provide little information for differentiating between granulomatous mastitis and carcinoma.

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Key words: Granulomatous mastitis, Breast cancer, MRI, Elderly woman

Granulomatous mastitis is a rare benign breast disease of unknown etiology. Because of its rarity, its clinical, cytological, and imaging characteristics have not been defined. There is no standard treatment, but excisional biopsy, with or without corticosteroid therapy, has been performed with variable results. Granulomatous mastitis is still a challenge to the surgeon with regard to both differential diagnosis and effective treatment. We present a case of idiopathic granulomatous mastitis mimicking breast carcinoma in an older Japanese woman.

Case Report

A 58-year-old woman presented with a breast mass and was admitted to the First Department of Surgery, Wakayama Medical University on December 5, 2000. The mass was elastic, hard and painless, 1.8 × 1.5 cm in size, and located in the upper outer quadrant of the right breast. Small and soft lymph nodes were palpable in the right axillary fossa. The patient had had two abortions and two deliveries; her last delivery was thirty years prior to the admission. The patient had no past history of malignancy, breast trauma, oral contraceptive use, tuberculosis, sarcoidosis, or other granulomatous disease.

The serum prolactin level was slightly elevated (13.5 ng/mL, normal < 10 ng/mL). Mammography demonstrated an ill-defined breast mass with amorphous calcification (Fig 1). Ultrasonography showed an irregular and hypoechogenic tumor. Magnetic resonance imaging (MRI) on a Siemens 1.5-T MR imager showed an irregular mass with early enhancement 1 minute after IV injection of gadolinium-diethylenetriaminepentaacetic acid (Gd-DTPA), and no washout for 6 minutes (Fig 2). Based on the mammographic, ultrasonographic and MRI findings, the lesion was strongly suspected to be breast cancer (T1cN0M0). However, fine needle aspiration cytology of the tumor showed no carcinoma cells. Clinically we could not obtain a definite diagnosis, so lumpectomy (wide local resection) was performed under local anesthesia as a diagnostic therapy. Histopathological examination revealed granulomatous mastitis characterized by infiltration of lymphocytes, plasma cells, neutrophils and multinucleic giant cells in the lobular architecture. No malignant cells were seen in the granulomatous lesion (Fig 3).

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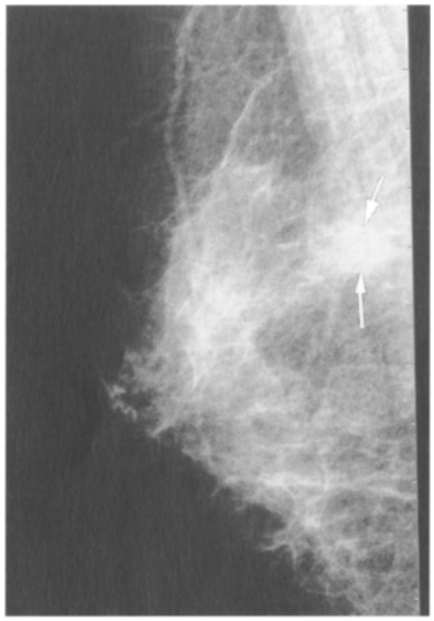

Fig 1. Mammography showed an ill-defined breast tumor with amorphous calcification (arrow).

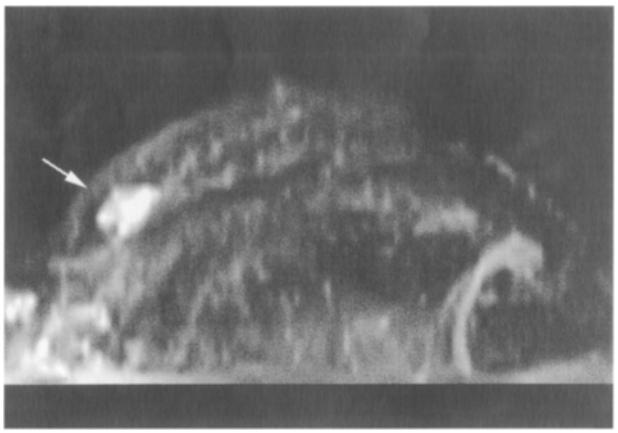

Fig 2. Magnetic resonance imaging (MRI) was performed on a Siemens 1.5-T MR imager with a 3D fast low-angle shot (FLASH) sequence. MRI showed an irregular mass with early enhancement 1 minute after IV injection of gadolinium diethylenetriamine-pentaacetic acid (Gd-DTPA) (arrow), and no washout for 6 minutes.

Because the surgical margin was free of the granulomatous lesion, corticosteroid therapy was not used. The patient was observed carefully for 6 months, during which neither wound complication nor recurrence was detected.

Discussion

Granulomatous mastitis was first described by Kesser and Wolloch in 1972[1]. Most of the cases in the literature occurred in parous women under 50 years old. This report follows another of idiopathic granulomatous mastitis in an old woman[2].

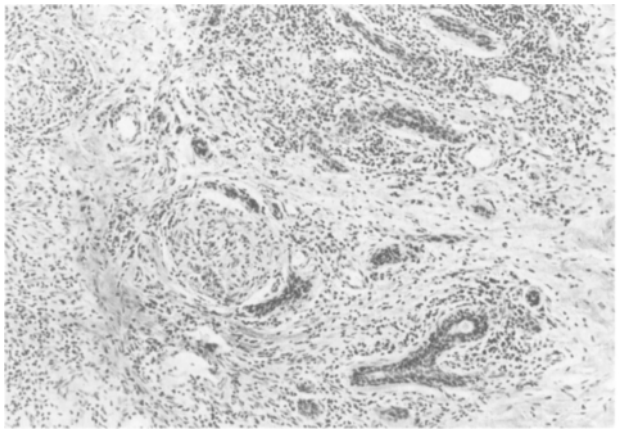

Fig 3. Histopathological examination revealed granulomatous mastitis characterized by infiltration of lymphocytes, plasma cells, neutrophils and multinucleic giant cells in lobular architecture (hematoxylin and eosin stain).

Histologically, the lesion is characterized by the presence of noncaseating granulomas in the breast lobules, in which no microorganism is present. The distinction between granulomatous mastitis and other inflammatory conditions such as tuberculosis, sarcoidosis, and cat scratch disease can be made by the clinical and pathological findings. The etiology of granulomatous mastitis is still unknown. Some reports have speculated on the correlation between granulomatous mastitis and localized autoimmune phenomena, hormonal perturbation caused by childbirth, or the prior use of oral contraceptives[1, 3]. No microorganism has been isolated from the tissue of this lesion, and histochemical stains for pathogens are routinely negative. The perilobular distribution and granulomatous character of the inflammation suggest a cell-mediated reaction to one or more substances concentrated in mammary secretions or lobular cells, but no specific antigen has been identified. It has been suggested that oral contraceptives may be a possible cause of granulomatous mastitis because about one-third of patients had previously used oral contraceptives in the literature. It is thought that oral contraceptives induce hyperplasia in lobular ductules leading to obstructive desquamation of ductular epithelial cells, distension of ductules, and ultimately a perilobular inflammatory infiltration. However, the present case has no history of oral contraceptive use. Consistent with two previous reports[4, 5], we detected an elevated

prolactin level. Prolactin has the physiological effect of stimulating mild secretion in the presence of estrogens and progesterone and produces the lobulo-alveolar architecture of the breast in pregnancy. The relationship between a high prolactin level and granulomatous mastitis needs further clinical research to be elucidated.

The clinical and radiographic findings of granulomatous mastitis often suggest carcinoma. Mammographic findings are not useful for differentiating between granulomatous mastitis and breast cancer, because in the literature, all of the reported 7 cases showed a malignant pattern on mammography[1, 3, 6-10]. The present case, similarly, showed an ill-defined breast mass with amorphous calcifications. Engin *et al.* reported that ultrasonography was more useful for diagnosing granulomatous mastitis than mammography[10]. However, ultrasonography also suggested a malignant diagnosis and did not provide further valuable information in the present case.

MRI was not commonly used until recently in the diagnosis of breast disease. Therefore, the MRI characteristics of granulomatous mastitis have not been established. In the literature, only one report described the MRI features of granulomatous mastitis[11]. Van Ongeval *et al.* described a case of granulomatous mastitis showing two irregular active lesions on MRI. Moreover, the two lesions showed different contrast enhancement patterns. One lesion showed an early enhancement pattern followed by washout, and the other lesion showed a gradual enhancement without washout. The present case showed an early enhancement pattern without a washout. Buadu *et al.* described time intensity curves classified into four types (type A, type B, type C and type D) on the basis of the results of a phase analysis of peak enhancement and washout. In type A, peak enhancement was seen in the early phase and decreased during the delayed phase. In type B, enhancement increased in the early phase and was followed by a plateau in the delayed phase. In type C, there was no peak, and in type D, no definite increase in enhancement was seen throughout the examination[12]. Type A, B, C and D curves correlate with malignancy 95%, 92%, 26% and 0% of the time, respectively[12]. The time intensity curve of the present case coincided with the type B curve, so the lesion was suspected to be breast cancer. Both present and the previous[11] reports suggest that granulomatous mastitis mimics breast carcinoma on MRI, therefore, MRI is not useful for differentiating granulomatous mastitis from carcinoma.

Fine-needle biopsy is routinely used for the diagnosis of breast disease in many institutes. Although some reports showed that fine needle aspiration cytology could accurately diagnose granulomotous mastitis[9, 13], it was not useful in the present case. The cytological findings of the lesion are helpful for suggesting granulomatous mastitis but not helpful for excluding cancer, because multinucleic giant cells may also be found in breast cancer lesions.

The therapeutic strategy for granulomatous mastitis has not been established because of its rarity. Surgical intervention and corticosteroid therapy has been recommended[14]. After operation, delayed wound healing has been reported previously[13]. Some patients have had relapses in the form of chronic mastitis after operation. We did not use corticosteroid therapy for the present case because of the negative surgical margins. The patient was observed carefully for 6 months, during which neither wound complication nor recurrence was detected. Whether complete resection is sufficient treatment for granulomatous mastitis should be further investigated.

Awareness of granulomatous mastitis, is important for surgeons because the definitive diagnosis can only be made microscopically. There are early reports of pre-operative radiotherapy and mastectomy having been performed for this benign lesion because of the clinical diagnosis of cancer[6, 7, 15]. The present case is presented to enhance awareness that granulomatous mastitis can occur in an older woman and mimic carcinoma even on MRI, as well as to emphasize the need for further research for appropriate diagnostic and therapeutic methods.

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