Surg Today
Jpn J Surg (1996) 26:730–733

SURGERY TODAY

Granulomatous Mastitis Diagnosed and Followed up by Fine-Needle Aspiration Cytology, and Successfully Treated by Corticosteroid Therapy: Report of a Case

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Abstract: A 36-year-old woman presented to our hospital with a rapidly growing lump in her left breast. Fine-needle aspiration (FNA) cytology of the mass revealed many epithelioid cells admixed with multinucleated Langhans-type giant cells, neutrophils, lymphocytes, and stromal cells, leading to a diagnosis of granulomatous mastitis. This report describes the clinical course of this patient in whom granulomatous mastitis was successfully treated with corticosteroid therapy. Special reference is made to the usefulness of FNA cytology in the diagnosis and follow-up of this disease.

Key Words: granulomatous mastitis, breast, aspiration cytology, ultrasonography

Introduction

Granulomatous mastitis is a rare inflammatory disease of unknown etiology.[1] Although this disease frequently mimics breast cancer, it can be diagnosed by fine-needle aspiration (FNA) cytology.[2] In the past, wide resection of the affected tissue was often adopted as the method of treatment, but many patients developed recurrences and complications, such as abscess formation, fistulae, and persistent wound infection.[3–5] Recently, corticosteroid therapy has been shown to be efficacious for this disease;[6] however, this therapeutic modality has not been fully established because of the rarity of the disease. We present herein the case of a patient with granulomatous mastitis effectively treated with corticosteroids, whose clinical course was monitored by repeated FNA cytology and ultrasonography examinations.

Reprint requests to: H. Yamashita
(Received for publication on June 7, 1995; accepted on Mar. 4, 1996)

Case Report

A 34-year-old woman was admitted to the Kyushu University Hospital on May 10, 1994, for the investigation of a mass in her left breast which had been growing rapidly for 1 month prior to admission. The patient had given birth to her first child 3 years previously, and had no history of breast trauma, using oral contraceptives, or any family history of breast cancer. Physical examination revealed a firm and tender mass, 8 × 8 cm, located in the upper outer quadrant of the right breast. Small and soft lymph nodes were palpated in the left axillary region. The breast mass was assessed on these physical findings as being malignant. Laboratory examinations showed an elevated leukocyte count of 10110/mm^3 with 86% neutrophils, and the delayed hypersensitivity skin test with purified protein derivative was negative. The antinuclear antibody, rheumatoid factor, angiotensin-converting enzyme level, and serum immunoglobulin values were all within normal levels. The patient had normal chest radiographs.

A mammography demonstrated an ill-defined dense mass shadow without microcalcifications in the left breast, and ultrasonography revealed an irregular shaped hypoechoic mass, 6.5 cm in diameter, in the left breast (Fig. 1). FNA cytology of the breast tumor showed many epithelioid cells admixed with multinucleated Langhans-type giant cells, neutrophils, lymphocytes, and stromal cells, leading to a diagnosis of granulomatous mastitis (Fig. 2a). A needle biopsy of the mass was subsequently performed, the histopathology of which revealed a granulomatous lesion composed of epithelioid histiocytes accompanied by neutrophilic infiltration, confirming the findings characteristic of this disease (Fig. 3). Bacterial cultures and acid-fast bacilli staining were negative. Treatment with prednisolone 60 mg/day was initiated, 2 weeks following which the granulomatous mass had decreased in size to 5 × 5 cm.

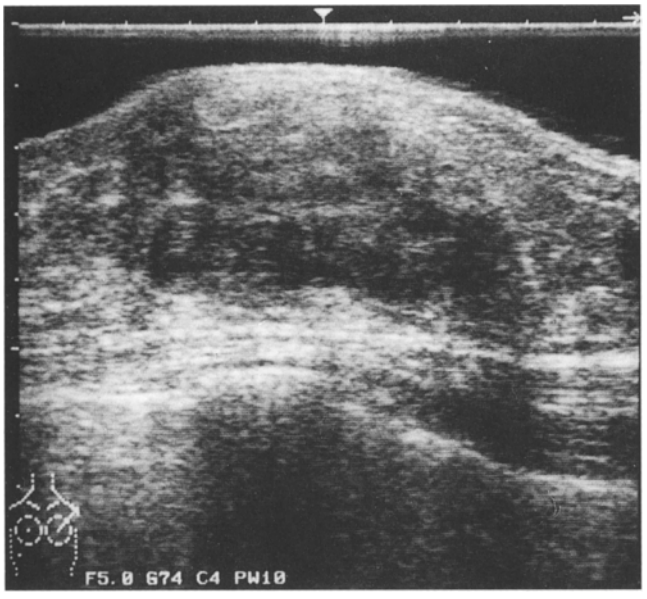

Fig. 1. Ultrasonography demonstrating an irregular hypoechoic mass

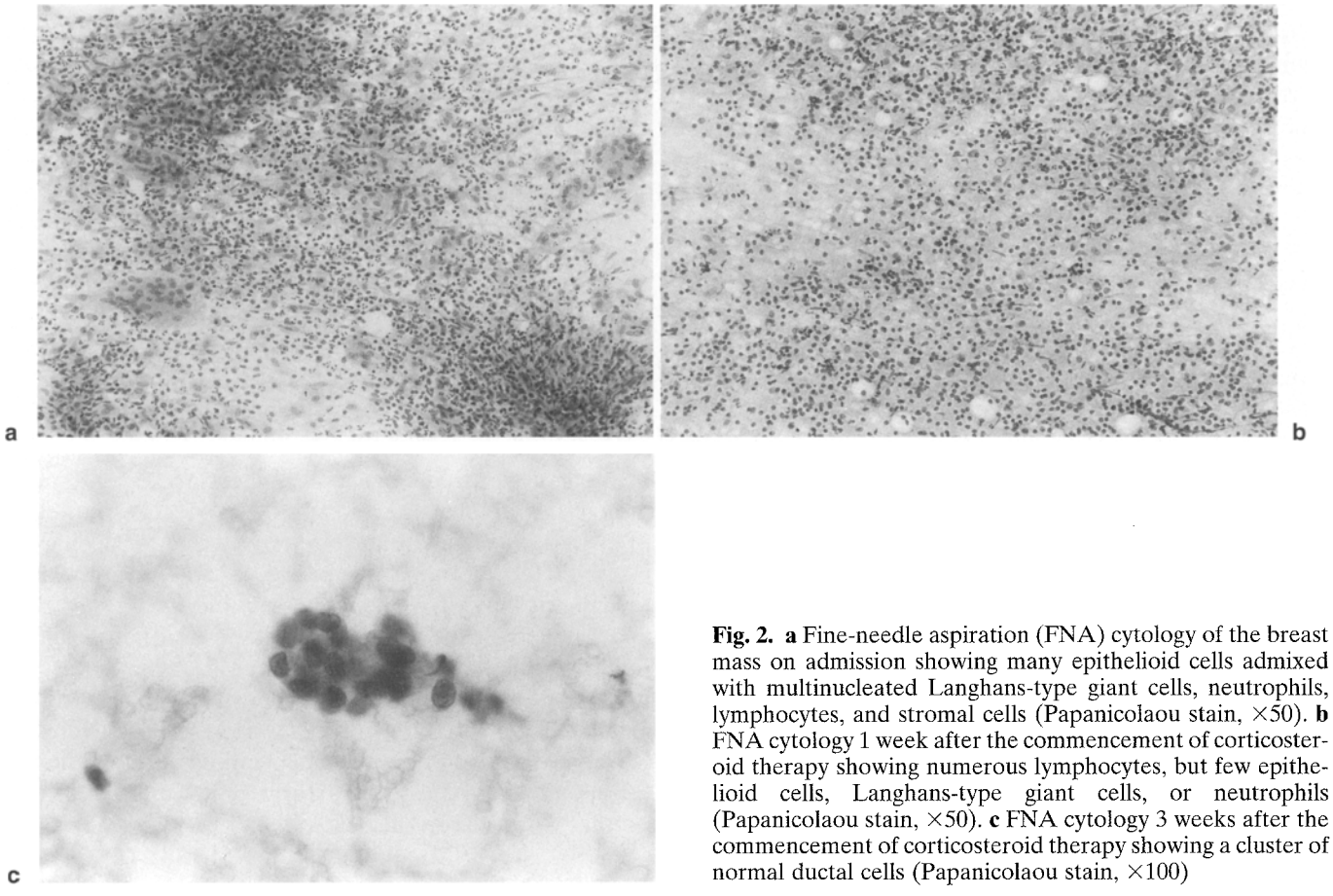

Fig. 2. **a** Fine-needle aspiration (FNA) cytology of the breast mass on admission showing many epithelioid cells admixed with multinucleated Langhans-type giant cells, neutrophils, lymphocytes, and stromal cells (Papanicolaou stain, ×50). **b** FNA cytology 1 week after the commencement of corticosteroid therapy showing numerous lymphocytes, but few epithelioid cells, Langhans-type giant cells, or neutrophils (Papanicolaou stain, ×50). **c** FNA cytology 3 weeks after the commencement of corticosteroid therapy showing a cluster of normal ductal cells (Papanicolaou stain, ×100)

The prednisolone was thereafter slowly tapered by 10 mg a week and the patient was discharged from hospital on June 16, 1994, and followed up on an outpatient basis. The daily dose of prednisolone was tapered to 5 mg at 2 months, then to 2.5 mg 4 months after the beginning of therapy, and the mass continued to decrease in size gradually. The FNA cytology 1 week after the beginning of corticosteroid therapy showed numerous lymphocytes, but the number of epithelioid cells, Langhans-type giant cells, and neutrophils was de-

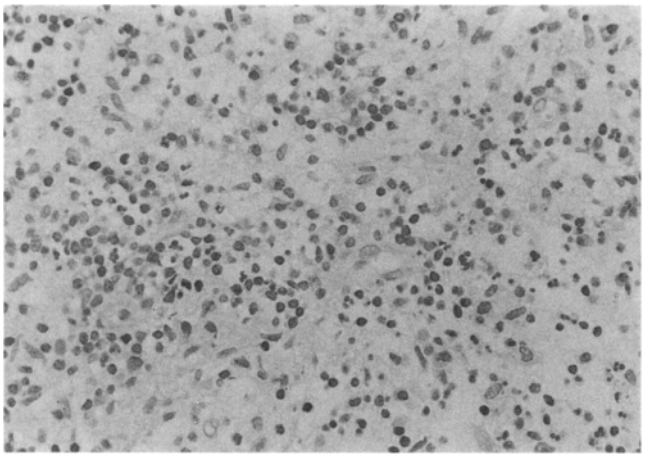

Fig. 3. Histopathology of the needle-biopsied specimen showing a granulomatous lesion composed of epithelioid histiocytes accompanied by neutrophilic infiltration (H&E, ×100)

creased (Fig. 2b). The FNA cytology 3 weeks after the treatment revealed the normal constituents of breast tissue (Fig. 2c). An irregular-shaped hypoechoic area demonstrated by ultrasonography slowly decreased in size and had disappeared by February, 1995. Steroid therapy was stopped in April, 1995, 11 months after the beginning of treatment, at which time neither palpation nor ultrasonography could detect any lesion.

Discussion

Granulomatous mastitis was first described as a distinct clinical entity by Kessler and Wolloch in 1972.[4] This disease mainly occurs in young parous women, frequently in association with recent pregnancy.[7] Clinically, the patients present with unilateral, extraareolar breast masses, which have often developed within a relatively short period as in our patient.[1,3] Because granulomatous mastitis mimics breast cancer, it may be mistaken for a malignancy, particularly if the regional lymph nodes are enlarged.[3] The histologic feature is granulomatous inflammation, consisting of epithelioid cells, Langhans-type giant cells, and often neutrophils confined to the lobules.[7] Macansh et al. also reported a case of granulomatous mastitis diagnosed by FNA cytology.[2] In our patient, smears from the FNA showed the above characteristic features, and a needle biopsy confirmed the diagnosis. However, other granulomatous diseases, such as tuberculous mastitis, plasma cell mastitis, and sarcoidosis of the breast should be excluded.[1–3] The differentiation of granulomatous mastitis from other granulomatous diseases can be made on histologic grounds, as granulomatous mastitis lacks the caseation seen in tuberculous infection, and the predominance of plasma cells seen in plasma cell mastitis.[3] Furthermore, in sarcoidosis, the granulomas are scattered throughout the breast tissue with no relation to the lobules, in contrast to granulomatous mastitis where the inflammation is generally confined to the breast lobules.[1] Chest radiography, the Kveim test, and measurement of the serum angiotensin-converting enzyme may also be appropriate for differentiating granulomatous mastitis from sarcoidosis. On the other hand, infections caused by tuberculosis, fungi, aerobic, and anaerobic organisms should be excluded by special stains and cultures of the affected tissue.

Regarding the treatment of granulomatous mastitis, although wide excision of the mass was traditionally employed in the past, this was followed by a fairly high rate of recurrence, skin ulceration, abscess formation, fistulae, and wound infection.[3–5] DeHertogh et al. first advocated the use of corticosteroids for the treatment of granulomatous mastitis, after observing a granulomatous mass disappear within 3 weeks of administering high-dose prednisone.[6] Jorgensen and Nielsen reported two cases where 60 mg of prednisone/day was given until resolution of the granulomatous mass was achieved, which took 4 and 6 months, respectively.[1] In our patient, 60 mg of prednisolone per day was administered for only 2 weeks, whereafter the dose was slowly tapered based on the findings of FNA cytology, ultrasonography, and palpation.

FNA cytology revealed that the aspirate 1 week after the beginning of corticosteroid therapy contained many lymphocytes, but fewer epithelioid cells, Langhans-type giant cells, and neutrophils. By the completion of 3 weeks of therapy, it showed less cellularity, with the normal constituents of breast tissue. The size of the mass on palpation and ultrasonography diminished slowly after 2 weeks of treatment. These clinical findings suggest that it may not be necessary to continue high doses of corticosteroids until complete resolution of the mass is achieved, and that repeated FNA cytology is useful to determine the adequate dose. Moreover, recurrence may easily be diagnosed by FNA cytology and treated with another course of corticosteroid therapy as described by Jorgensen et al.[1]

The case described herein demonstrates that the diagnosis of this rare breast disease can be established by FNA cytology, and that repeated examinations during the course of corticosteroid treatment are useful to determine the necessary doses.

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