Idiopathic granulomatous mastitis: a case report and literature review

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Introduction

Idiopathic granulomatous mastitis (IGM) or granulomatous lobular mastitis is a rare chronic inflammatory disease of the breast in women (1). This disease commonly occurs shortly after a women's last pregnancy with a history of childbirth and breastfeeding that increases, especially in developing countries (2, 3). Despite the reports of this disease, which show an increase in its prevalence in recent years, the cause of its etiopathogenesis remains little known and diversified (3). An autoimmune or hypersensitivity reaction is the most common hypothesis regarding the etiology of the disease. However, trauma to the epithelium of the mammary ducts and extravasation of milk or duct secretions to the connective tissue, hyperprolactinemia, oral contraceptives, or bacterial origin have been considered (3, 4).

IGM usually presents with a unilateral or bilateral progressive painful breast lump. Patients with chronic IGM can develop fistulae, sterile abscesses, and nipple inversion (5). Bilateral IGMs have a higher relapse rate and more excellent resistance to medical therapies than unilateral IGMs (6). Histological evaluation applies to definite diagnosis while imaging methods differential diagnosis for breast cancer (3) because abscesses can lead to being mistaken for breast cancer (7). Therefore, after causes must be considered, including breast cancer, autoimmune breast disease, and infection, the final diagnosis of IGM is often made (4, 7).

Although the most appropriate treatment protocol has not yet been identified, some studies recommend surgical removal, while others suggest medical treatment such as antibiotics, corticosteroids, immunosuppressants, and anti-inflammatory drugs (3). The results of our literature review about information and case report IGM are summarized and exhibited in Table 1.

This study describes a patient who presented with a breast lesion diagnosed as IGM, and two months after treatment with prednisolone, she was infected by Brucella.

Case history / examination

A 38-year-old woman was presented with a 3-week history of a painful right retro-areolar mass unresponsive to a course of antibiotics. She had no significant past medical history. She was not on any chronic medication and had not used the oral contraceptive pill. She had no history of breast trauma and a family history of breast cancer. Our case had two pregnancies in 14 and 2 last years. Also, she has a history of breastfed for her second child for 12 months in the previous year. Clinically, a unilateral firm right retro-areolar breast mass was tender to palpation. The overlying skin was thickened and slightly warm. There was no associated nipple discharge or skin sinus.

Differential diagnosis, investigations and treatment

In continuation, our investigation by mammography for breast mass revealed bilateral moderately dense fibroglandular breast parenchyma in the right retro-areolar region was a poorly defined area of increased density. Ultrasound revealed an irregularly outlined hypoechoic mass measuring 19 mm x 17 mm x 20

mm. Ultrasound-guided core biopsy of the mass was performed. The biopsy demonstrated features of chronic granulomatous mastitis that was negative for malignant cells (Fig.1). Stains, in order to detect bacterial (Gram), fungal elements (PAS, Grocott's), and acid-fast bacilli (Ziehl-Neelsen), were negative. In continuation, negative results were obtained for the brucellosis serologic and autoimmune disease tests. The patient was treated conservatively with steroids and showed good resolution of her symptoms within one month, but after 2months, the patient presented with symptoms of joint pain and headache. She was tested for brucellosis and other tests because she lived in a Brucella endemic area and used local dairy products. The Brucella agglutination tests showed positive results with tetration Wright: 1/160,2ME: 1/80, Coombs Wright: 1/160. Therefore, she was treated with doxycycline and rifampin for six weeks, and prednisolone was continued as prescribed. The symptoms and signs of the recent illness (Brucella) improved. Moreover, prednisolone was tapered out and stopped within five months of its initiation.

Outcome and follow-up

During the one-year follow-up, her symptoms and signs of IGM did not return, and she was magnificent.

Discussion

IGM is a chronic benign breast disease observed in women of childbearing age, occurring within five years of the last delivery (2). Veyssiere et al. 1967 described IGM for the first time (Veyssiere 1967, as cited in Oze,2022) (2). The literature described that the prevalence of IGM is associated with race and region (8). Its etiopathogenesis remains unsolved, that diagnostic and therapeutic are challenging.

Non-mass-like lesions with restricted diffusion were observed in IGM. Despite, these lesions being pathology, they may show clustered ring-like enhancement same as malignant lesions (9). They are of variable size, usually firm, tender, ill-defined, and unilateral (5). In our patient, lesion was retroaleolar unilateral, ill-defined, tender and warm in touch, and erythemato in appearance.

Often IGM is challenging to differentiate clinically and radiologically from infectious etiologies such as tuberculosis and fungal infections, and also from malignancy, thus posing a diagnostic dilemma (10). Our patient had received a course of antibiotic treatment due to a make a mistaken diagnosis of the infection. Also, she denied any previous disease and recent breast trauma. Finally, checking the breast for cancer and negative results for infectious tests led to the IGM diagnosis.

There is no consensus about the optimal treatment for IGM (11). Several treatment modalities exist for patients with IGM that, to resolve its lesions completely, require more than one (12). A meta-analysis illustrated that combining steroids and surgery in treating patients with IGM is better than only steroids. It even may lead to a lower rate of recurrence and side effects in these patients (13). In the last years, surgery has been avoided in most cases, introducing a more conservative medical approach(14). While some studies declare surgical in IGM patients with wide excision provides the best long-term outcome (15, 16).

In our case, the medical team did not recommend surgery, and corticosteroids were used to treat IGM. Unfortunately, after taking prednisolone for 2 months, she got Brucella disease. There is systemic immune dysregulation in patients with IGM, so alterations in T cells, NK, and NKT cells were reported (17). Moreover**,** prednisolone can weaken the immune system and make it easier to get infections. The literature demonstrates that corticosteroids increase the risk of severe conditions and some opportunistic infections (18).

IGM is a challenging chronic inflammatory disease of the breast with unknown etiology and unusual manifestations. Although the most appropriate treatment protocol has not yet been identified, prednisolone was used in our patient as an effective and practical choice in the treatment of IGM.

Author Contributions

Shiva Shabani: Conceptualization; diagnosis and treatment of the case; writing – original draft.

Bahman Sadeghi: Literature review; writing – original draft.

Nader Zarinfar: Contributing to the diagnosis and treatment of the case.

Roham Sarmadian: Contributing to the diagnosis and treatment of the case.

All authors read and approved the final manuscript.

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Not applicable.

Conflict of Interest Statement

All authors declare that they have no conflict of interest.

Ethics Approval Statement

The study protocol was approved by the Arak University of Medical Sciences Research Ethics Committee (IR.ARAKMU.REC.1401.227). All procedures performed in this study were in accordance with the 1964 Helsinki Declaration and its later amendments.

Consent Statement

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author.

Key Clinical Message

IGM is a challenging chronic inflammatory disease of the breast with unknown etiology and unusual manifestations. Although the most appropriate treatment protocol has not yet been identified, prednisolone was used in our patient as an effective and practical choice in the treatment of IGM. Moreover, our patient may have contracted Brucella infection due to changes in the immune system.

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Table1: Findings from literature review for IGM

Age	-Most women of childbearing age, several months to years after breastfeeding. -Rare cases were reported in 11 and 80 years-old	(5, 19)
Mentioned etiopathogenesis	-The etiopathogenesis is still unknown -Inflammation as a result of reaction to trauma, autoimmunity, and an infection such as Corynebacterium spp, and Corynebacterium kroppenstedtii -Metabolic or abnormal hormonal processes such as hyperprolactinemia, -Lactation disorders	(4, 8, 17, 20-22)
Pathology	- Noncaseating granulomas of a lobule-centric pattern (multi-nucleated giant cells, and epithelioid histiocytic located in the center of the lobules as well as neutrophils, lymphocytes, plasma cells, and a small number of eosinophils in the surrounding tissue) -lesions can be multifocal and form micro abscesses and vary in size	(4, 8, 21)
Differential diagnosis	-Idiopathic granulomatous lobular mastitis, -Periductal mastitis -Fibrocystic changes, and -Sclerosing lymphocytic lobulitis or diabetic mastopathy, -Tuberculosis, fungal infections -Malignancy	(10)

Imaging	-Ultrasonographic findings: hypo-echoic or heterogeneous mass with or without tubular extensions -Magnetic resonance imaging (MRI) findings: focal or diffuse asymmetrical signal intensity changes without significant mass effect -On dynamic contrast-enhanced MRI findings: IGM patients with mass-like or non-mass-like contrast enhancement, some of them with abscess positive -Mammographic presence of multiple contiguous iso-dense masses, the reniform contour of axillary lymph nodes with the preserved fatty hilum -Contrast-enhanced cone-beam breast-CT (CBBCT) findings: IGM mainly manifests as a non-mass enhancement on CBBCT, with persistently enhancing or plateau TDC	(9, 23-27)
Treatment	-Surgical, -Immunosuppressants, steroids, methotrexate, leflunomide, and antibiotics drugs -Prolactin-lowering medications .	(11, 12, 14-16, 28-31)

Figure Legends:

Figure 1. Pathological result for our patient with Idiopathic granulomatous mastitis (IGM) . Evaluating pathology indicated a number of ductal cells (1-2 hpf), Red cells (15-20 hpf), and frequent PMNs with macrophages and epithelioid granuloma without exist of malignant cell.