https://doi.org/ 10.33472/AFJBS.6.9.2024.2226-2235

African Journal of Biological Sciences

Journal homepage: http://www.afjbs.com

Research Paper Open Access

Diagnosis and management of idiopathic granulomatous mastitis : A retrospective-prospective case series

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Article History

Volume 6,Issue 9, 2024

Received:21 Mar 2024

Accepted : 30 Apr 2024

doi: 10.33472/AFJBS.6.9.2024.2226-2235

Abstract

Background: Idiopathic granulomatous mastitis (IGM) is a rare benign chronic inflammatory breast pathology that poses a challenge in its diagnosis and treatment for the majority of breast surgeons. Little has been described regarding that disease in the Egyptian setting. Herein, we describe our experience regarding the management and outcomes of IGM in our tertiary surgical setting.

Patients and methods: Fifteen patients diagnosed with IGM were enrolled in our case series. Data regarding their history, presentation, management, and short-term outcomes were collected.

Results: All patients were parous, with an age ranging between 36 and 56 years. Contraception use was reported by four women (26.7%). Most patients had a breast lump (86.7%), while skin changes were detected in 73.3% of them. Additional presentations included pain (53.3%) and sinus formation (20%). Bilateral involvement was present in two women (13.3%). Ultrasonographic assessment revealed a mass, an abscess, and parenchymal heterogenicity in 73.3%, 46.7%, and 26.7% of patients, respectively. Most patients (60%) were managed with combined surgery and steroids, while the remaining patients had either surgery (20%) or steroid therapy (20%). The mean resolution time was 5.13 months, with a short-term recurrence rate of 13.33% (13.3%). One patient was managed by surgery, while the other one received steroid therapy.

Conclusion: IGM remains challenging to diagnose because of its similarities with breast malignancy. Both steroid therapy and surgery are effective in the management of that pathology when suited for every patient, with a low recurrence rate in the short term (13.3%).

Keywords: Idiopathic granulomatous mastitis; Diagnosis; Management.

Introduction

Idiopathic granulomatous mastitis (IGM) is a benign chronic inflammatory breast condition **[1]** that was initially described in 1972 by Kessler and Wolloch **[2]**. The incidence of that pathology is not precisely known, but it represents about 2% of benign breast lesions **[3]**.

Although it was described as idiopathic in nature, some autoimmune mechanisms have been described **[4]**, based on its response to steroid therapy **[5, 6]**. Also, Corynebacterium has been implicated in the pathogenesis of that disease **[7, 8]**.

IGM poses a challenging entity for most surgeons when it comes to its diagnosis and management **[3]**. As regard the diagnosis, the patients often have cancer-like manifestations like breast lumps, nipple changes, and axillary lymphadenopathy **[9, 10]**. Additionally, its management is still controversial, with no clear guidelines regarding the gold standard approach. Available options include watch and wait, immunosuppressive medications (like steroids and methotrexate), and surgical excision **[1, 11, 12]**.

The literature is poor with the Egyptian experience regarding the management of IGM patients. Herein, we describe our experience regarding the diagnosis, treatment, and outcomes of that rare pathological entity in our tertiary surgical setting.

Patients and methods

This prospective and retrospective trial was conducted at the Assiut University General Surgery Department, after gaining ethical approval from the Institutional Review Board (IRB) of our faculty of medicine. Our case series was designed for women in the childbearing age who were diagnosed with IGM, based on clinical findings and histopathological examination, in our department during the period between January 2018 and December 2020.

The data of the patients meeting the previous criteria was collected and reviewed. We excluded the data of the patients diagnosed with secondary granulomatous mastitis, including tuberculosis, postsurgical foreign body reaction, fat necrosis, and fungal infection. We also excluded patients with duct ectasia or sarcoidosis.

Fifteen patients met our inclusion criteria, and their medical records were retrieved. The evaluation and management of these patients were performed by the same surgical team. History taking focused on age, oral contraceptive intake, local breast trauma, family history of breast cancer, the presence of autoimmune diseases, the main complaint, and the duration of symptoms. Clinical examination focused on patients' body mass index (BMI), the nature of the lesion, the presence of a mass (with its dimensions), a breast abscess, or a sinus.

Radiological assessment was also done for all patients, including breast ultrasound, while mammography was preserved for women aged older than 40 years. A magnetic resonance imaging was ordered when malignancy was suspected. Additional investigations included a tuberculin skin test, a polymerase chain reaction for TB, and a chest x-ray for the exclusion of tuberculosis.

A true-cut biopsy was also done for all patients, and the tissue specimen was sent to the histopathology laboratory for examination, The tissue was treated with haematoxylin and eosin stains for microscopic examination. Additional stains were used, like Gram, Ziehl-Neelsen, and periodic acid Schiff, for the detection of Corynebacterium, tuberculous bacilli, and fungal organisms, respectively.

The slides were examined by two experienced pathologists, and the diagnosis of IGM was confirmed when a chronic lobular granulomatous reaction was detected in the absence of any organisms and caseous necrosis.

Regarding our management plan, patients who presented with a breast abscess underwent drainage, and a broad-spectrum antibiotic was commenced for them. We also prescribed antibiotics for patients with skin inflammation or infected sinuses. The main management plan for the lesions was surgical excision, steroid therapy, or both. The choice of the management plan was dependent on the severity of the symptoms, lesion dimensions, the physical status of the patient, and patient preference. We recommended steroid therapy for patients with severe disseminated lesions or when there was a contraindication for surgery and general anesthesia. Steroid therapy was as follows; prednisolone 16 mg twice daily for two weeks, followed by gradual tapering over a six-week period.

Follow-up visits were scheduled for all patients in our surgical outpatient clinic. Clinical and ultrasonographic assessment was done for all patients during these visits. The duration till symptom resolution and the recurrence rate were recorded.

The previously collected data were analyzed using the SPSS software for Windows (Version 26). The numerical data were expressed as mean and median with standard deviations and ranges, respectively. Categorical variables were expressed as frequencies and percentages.

Results

The mean age of the enrolled 15 patients was 43.20 ± 5.05 years, with a range between 36 and 56 years. Their mean body mass index (BMI) was 25.60 ± 4.09 (kg/m2). Only four women had a history of oral contraception (26.7%). The range of parity was between three and six, while the number of their living children ranged between one and four children (Table 1).

Table (1): Baseline characteristics of the enrolled patients.

	N= 15
Age (years)	43.20 ± 5.05
Range	36-56
Parity	3-6
Living children	1-4
Body mass index (kg/m^2)	25.60 ± 4.09
Contraception	4 (26.7%)

The duration of symptoms ranged between one and four months (mean = 2.46). A palpable mass was detected in 13 patients (86.7%) with a mean size of 4.06 ± 0.79 mm. We also found that 8 (53.3%), 11 (73.3%), and 3 (20%) patients had breast pain, skin changes, and sinus formation, respectively. Nine patients (60%) had their right breast affected, while the left side was affected in four patients (26.7%). The remaining two patients (13.3%) had bilateral involvement (Table 2).

Table (2): History and examination findings in the enrolled patients.

	N= 15
Duration of symptoms (months)	2.46 ± 0.84
Range	1-4
Palpable mass	13 (86.7%)
Size of mass (mm)	4.06 ± 0.79
Breast pain	8 (53.3%)
Skin changes	11 (73.3%)
Sinus formation	3 (20%)
Side	
Right	9 (60%)
Left	4 (26.7%)
Bilateral	2 (13.3%)

Breast US revealed the presence of an irregular mass, an abscess, and parenchymal heterogenicity in 73.3%, 46.7%, and 26.7% of patients, respectively (Table 3).

Table (3): Ultrasonographic findings in the enrolled patients.

	N= 15
Irregular mass	11 (73.3%)
Abscess	7 (46.7%)
Parenchyma heterogeneity	4 (26.7%)

Most patients were managed by surgery plus steroid therapy (60%), while three cases (20%) were managed with surgery alone. Another three patients received steroid therapy alone. The mean time to resolution was 5.13 ± 0.64 months. Only two patients developed recurrence after 12 months; one patient received surgery alone, and the other was managed with steroid therapy alone (Table 4).

Table (4): Type of therapy and outcome of the enrolled patients.

	N= 15
Type of therapy	
Surgery with steroid therapy	9 (60%)
Surgery	3 (20%)
Steroid therapy	3 (20%)
Time to resolution (months)	5.13 ± 0.64
Recurrence	2 (13.3%)

Discussion

In this case series, we present our experience in the diagnosis and management of IGM at Assiut University Hospitals. In our series, the age of the patients ranged between 36 and 56 years (mean = 43.2). Multiple studies reported that this entity mainly affects women in the childbearing age **[4, 9, 13]**. One

could see that the upper limit of our range has exceeded the limit of the child bearing period, which is in agreement with previous studies that described the same pathology in post-menopausal women **[14, 15]**.

Although IGM occurs predominantly in women, as shown in our study, previous studies have reported its incidence in men **[16, 17]**.

In our study, all participating women were parous, with a parity ranging between 3 and 6. Parity and breast feeding have been reported as strong risk factors for IGM **[18-20]**. It has been proposed that microtrauma associated with breast feeding could lead to an autoimmune reaction towards milk proteins, resulting in a non-caseating granuloma **[9]**. Although the majority of our patients reported previous breast feeding, they were not actively lactating when presented to us, which also coincides with previous reports **[21, 22]**.

History of oral contraceptive pill administration was reported by 26.7% of our patients. Pak et al. reported a 36.7% prevalence of contraceptive intake **[23]**. Prasad et al. reported a higher prevalence of contraceptive use, as about half of their cases reported its use (54.79%) **[24]**.

In our series, a breast lump was the most common presentation, followed by skin changes. Other manifestations included pain and sinus formation. Tan and his colleagues reported that a breast lump was the most common presentation (91.2%), followed by breast pain (67.3%). Other manifestations included skin changes (22.1%), fistula (4.4%), and fever (3.5%) **[8]**. One could see some diversity among studies in the distribution of patient presentations. However, mass, pain, and skin changes remain the most common manifestations **[25-27]**.

Most of our patients had a unilateral disease, while only two of them had bilateral involvement (13.3%). Few cases of bilateral IGM have also been described in the literature **[14, 28, 29]**.

Our ultrasonographic findings included mass (73.3%), abscess (46.7%), and parenchymal heterogenicity (26.7%). Kiyak and his associates also reported that irregular masses, parenchymal heterogenicity, and abscess were the most common ultrasonographic findings in IGM patients **[30]**. Other authors reported additional findings like obliteration of the subcutaneous fat and increased parenchymal vascularity on doppler assessment **[31, 32]**.

Although we used MRI in doubtful cases, when malignancy was suspected, Rieber et al. negated any significant beneficial value of MRI in differentiating IGM from inflammatory carcinomatous lesions, as both entities had signs of inflammation **[33]**.

Our patients were managed as follows; surgery and steroids (60%), surgery alone (20%), and steroids alone (20%). The decision to choose the management modality was dependent on many factors as mentioned in the “methodology” section.

Multiple management options are available for IGM, with no clear recommendations when to choose each approach. Observation, medications, and surgery are the available options. Medications include steroid **[1]** and methotrexate **[12]**, and sometimes dopamine agonists **[34]**.

Steroid therapy is widely accepted among surgeons due to the wide acceptance of the autoimmune theory **[8]**, and multiple regimens have been described **[35, 36]**. The doses range between 30 and 60 mg of prednisolone per day with gradual tapering (1 week to 22 months) **[37]**. Steroid administration is effective for mass volume reduction **[38, 39]**. Moreover, it may help to obtain better cosmetic results following surgery **[11]**. However, it has its side effects, like exacerbation of infections **[40]**. Therefore, it

is crucial to rule out infections like tuberculosis before commencing that treatment, and that concept was applied in our setting.

Surgical options include drainage **[41]**, excision **[18]**, and even mastectomy **[42]**. Surgical excision provides a definite diagnosis along with its therapeutic effect. Nonetheless, surgery is not free of complications like poor wound healing, disfigurement, and sinus tract formation **[37, 43-45]**. Therefore, surgery is recommended to be reserved for patients with steroid resistance, recurrence after steroid therapy, complicated lesions (sinus, fistula, or abscess), extensive breast involvement (three quadrants), or long disease duration **[11]**.

In the current series, the incidence of recurrence was 13.3%. IGM is known for its protracted treatment course, with a reported recurrence rate ranging between 5% and 50% **[10, 19, 46, 47]**. Our incidence of recurrence lies within the previously reported range.

We believe that surgery and steroids are effective in managing IGM when properly suited for the patient. A similar concept has been published in the meta-analysis of Lei and his associates, who reported that the cure rate was 94.5% and 90.6%, while the recurrence rate was 4% and 6.8% for surgery and steroids, respectively **[48]**, revealing almost comparable outcomes between the two modalities.

Our series handled a rare breast disease. Nonetheless, it has some limitations. The small patient sample, short-term follow-up, and involvement of only one surgical center are the main drawbacks, that should be addressed in the upcoming studies.

Conclusion

IGM is remains challenging to diagnose because of its similarities with breast malignancy. Both steroid therapy and surgery are effective in the management of that pathology, when suited for every patient, with a low recurrence rate in the short term.

Conflicts of interest: Nil.

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