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Original Article

Comparison of Conservative versus Surgical Treatment of Idiopathic Granulomatous Mastitis

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ABSTRACT

Background and Objectives: Idiopathic granulomatous mastitis (IGM) is a persistent inflammatory disease of the breast. This study aimed to evaluate the efficacy of medical, surgical, and combined treatment approaches in patients with IGM.

Patients and Methods: A retrospective study was performed on 130 women with histopathologically confirmed IGM who were treated at the Breast Clinic in Sulaimaniyah City, Kurdistan Region, Iraq, between 2011 and 2025. Patients received medical therapy, surgical therapy, or a combination of both. Statistical analysis was performed using the Chi-square test, Fisher's exact test, and the Mann–Whitney test. A P value < 0.05 was considered significant.

Results: The mean patient age was 37.17 years. Antibiotics combined with corticosteroids were administered to 58 patients, and achieved remission in 93.1% (p = 0.001). Forty patients underwent drainage with antibiotics, corticosteroids, and anti-prolactin therapy, resulting in remission in 90.0% (p = 0.003). Wide local excision with antibiotics achieved remission in 41.7% (p = 0.1). While wide local excision combined with antibiotics and corticosteroids resulted in remission in 75.0% (p = 0.004).

Conclusions: Medical therapy alone or combined with limited surgical intervention showed higher remission rates and may be considered the preferred first-line management for IGM.

Keywords: Idiopathic Granulomatous Mastitis, Conservative therapy, Surgical Therapy, Corticosteroids.

1 Introduction

Idiopathic granulomatous mastitis (IGM) is a rare, non-malignant, persistent inflammatory condition of the mammary gland. It was first recognized by Kessler and Wolloch in 1972. The reported annual incidence is approximately 2.4 cases for every 100,000 individuals [1]. Approximately 97% of cases are classified as idiopathic [2]. The exact etiology remains unclear. However, autoimmune mechanisms may play a role. Several associated factors have been proposed, including the use of oral contraceptives, hyperprolactinemia, localized trauma, and deficiency of alpha-1 antitrypsin. [3]. It has been proposed that the stasis of milk during lactation may result in damage to the ducts, which may incite an excessive immune response and lead to granulomatous inflammation [2].

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IGM usually manifests as a painful, one-sided breast lump. Nevertheless, clinical presentations may vary and may include skin lesions, swelling of the axillary lymph nodes, nipple retraction, formation of sinus tracts, fistulas, or localized abscesses [3]. Because the clinical and radiological characteristics usually conflict with those of inflammatory breast carcinoma, histopathological confirmation, especially via needle core biopsy, is essential for a definitive diagnosis [4].

Radiologically, the most frequent finding is an irregular, focal mammographic density. This is often corroborated by sonography, which typically demonstrates a heterogeneous hypoechoic lesion with characteristic ductal extensions [5&6]. From a therapeutic standpoint, systemic corticosteroids are employed as a primary medical intervention or as adjuvant therapy to minimize post-surgical recurrence. Although surgical resection is a common treatment modality, clinical outcomes are often insufficient due to recurrence rates that can reach 50% and poor cosmetic outcomes. The literature suggests that a

multimodal approach, integrating surgery with steroid therapy, yields better outcomes than surgery alone [7-10].

Immunomodulators, such as, methotrexate, colchicine, and azathioprine, are frequently valuable in specific cases that are advanced, comprehensive, or persistent [11].

This study was planned to estimate and measure the therapeutic efficacy of three management strategies: medical therapy alone, isolated surgical resection, and a combined medical-surgical approach in patients diagnosed with IGM.

2 Patients and Methods

2. 1 Study Design and Setting

This research was structured as a retrospective comparative analysis carried out at the specialized Breast Clinic in Sulaimaniyah, Kurdistan Region, Iraq. The study population was identified through a systematic review of medical records for patients diagnosed with IGM between 2011 and 2025. Ethical consent from the Kurdistan Higher Council of Medical Specialties was obtained prior to data extraction [Reference Number: 1610; dated July 03, 2024].

2. 2 Participant Selection and Data Acquisition

The study group consisted of 130 women with histopathologically confirmed IGM who were managed in Sulaimaniyah Breast Clinic between 2011 and 2025.

Inclusion criteria: Female patients who received treatment at the breast clinic during the designated timeframe.

Exclusion criteria: Patients diagnosed with secondary granulomatous mastitis due to specific causes, including sarcoidosis, tuberculosis, or foreign body reactions, as well as pregnant individuals.

Initial data were obtained from patient records and telephone interviews. These included age, occupation, marital status, breastfeeding history, smoking habits, family history of hereditary breast cancer, and comorbid conditions. Additionally, symptoms such as breast lumps, discomfort, redness, edema, nipple and skin retraction, ulceration, and abnormal tract formation were documented.

2. 3 Diagnostic and Laboratory Protocols

All patients underwent clinical examination and breast ultrasound examination (USG) as the initial imaging modality, which was repeated at each follow-up visit. Patients older than 35 years were also referred for mammography (MMG) according to Breast Imaging-Reporting and Data System (BI-RADS) standards. To establish the diagnosis fine needle aspiration cytology (FNAC), needle core biopsy (NCB), or operative excision was performed. Additional laboratory tests included random plasma glucose (RPG), total leukocyte count (TLC), thyroid function tests (TFT), and serum prolactin levels.

2. 4 Therapeutic Classification and Remissions Criteria

Patients were categorized into three management groups: Medical Therapy: antibiotics with corticosteroids. Surgical Intervention: wide local excision or abscess drainage. Multimodal Therapy: combination of both medical and surgical approaches. For patients with an abscess, management included needle aspiration, incisional drainage, or surgical resection. The adequate time to achieve entire remission was 17.2 months (range: 6 to 80 months). Remission was defined as meeting the following criteria for at least four consecutive weeks: Clinical: Complete resolution of palpable masses, and inflammatory signs. Biochemical: Normal inflammatory markers, such as C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), and Total Leukocyte Count (TLC). Imaging: No pathological findings on follow-up ultrasound.

2. 5 Statistical Analysis

Statistical analysis was conducted utilizing SPSS Version 26.0. Categorical data were expressed as frequencies and percentages. While continuous variables were expressed as mean ± standard deviation (SD). Comparisons were performed using the Chi-squared test or Fisher's exact test for categorical data, whereas the Mann–Whitney U test was utilized for non-parametric comparisons. A p-value < 0.05 was considered statistically significant.

3 Results

The baseline characteristics of 130 patients showed a mean age of 37.17±6.91 (SD) years. Most participants were aged 23-40 years (n=85, 65.4%), resided in rural areas (n=96, 73.8%), were married (n=127, 97.7%), and had a history of breastfeeding (n=109, 83.8%), hereditary breast cancer (n=7, 5.4%). A prior history of oral contraceptive pills use was found in (n=18, 13.8%), while (n=7, 5.4%) were smokers, comorbid conditions were present in [n=4, 3.1%, including Diabetes mellitus (n=2, 1.5%), hypertension (n=1, 0.8%) and depression (n=1, 0.8%)] (Table 1).

Table 1: Fundamental features of individuals diagnosed with Idiopathic Granulomatous Mastitis IGM (n=130).

Essential features	Frequency	Percentage
Age range		
≤20	0	(0%)
20-29	17	(13.1%)
30-39	68	(52.3%)
40-49	38	(29.2%)

50-59	6	(4.6 %)
60-69	1	(0.8%)
Residency		
Urban area	34	(26.2%)
Rural area	96	(73.8%)
Marital state		
Yes	127	(97.7%)
No	3	(2.3%)
Lactation history		
Yes	109	(83.8%)
No	21	(16.2%)
Hereditary breast cancer		
Yes	7	(5.4%)
No	123	(94.6%)
OCCP		
Yes	18	(13.8%)
No	112	(86.2%)
Smoking		
Yes	7	(5.4%)
No	123	(94.6%)
Co-morbidities		
No	126	(96.9%)
Hypertension	1	(0.8%)
Diabetes mellitus	2	(1.5%)
Depression	1	(0.8%)

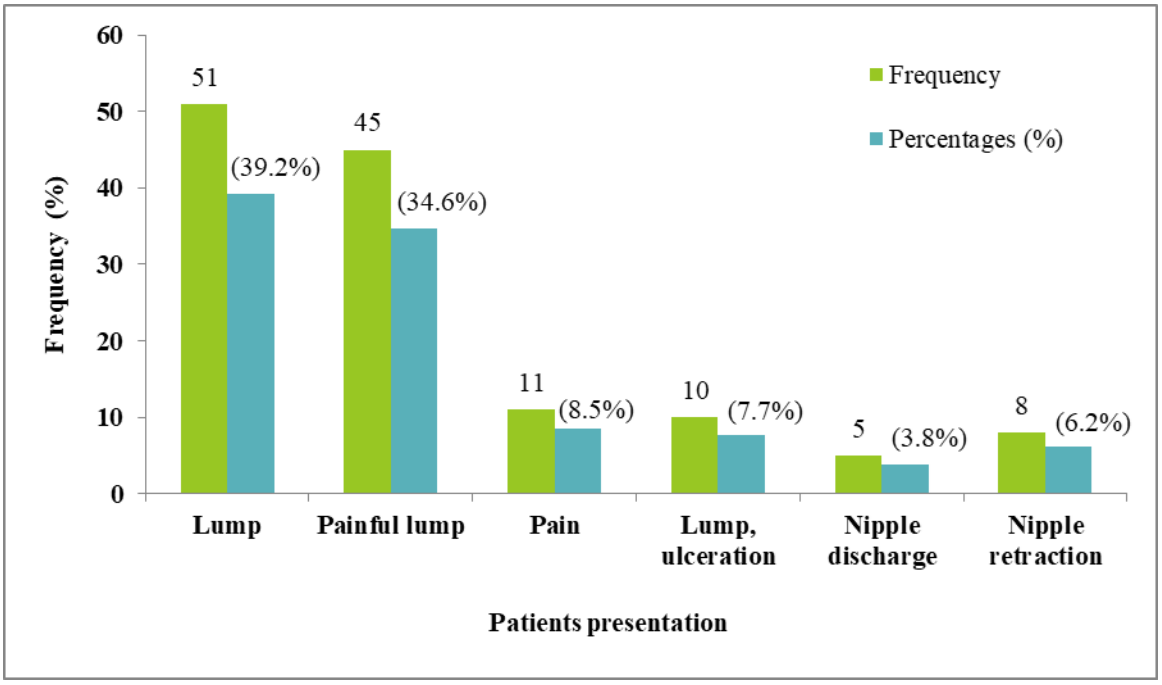

Figure 1: Medical demonstration of participants with IGM (n=130).

Concerning laboratory outcome, the white blood cell count was elevated in more than half of the cases (n=67, 51.5%). Elevated serum prolactin levels were observed in 40 patients (30.8%), just one case (0.8%) had high blood sugar (Table 2).

Table 2: Laboratory findings of patients identified with IGM (n=130).

Parameters	Frequency (Percentage)
WBC	
Normal	63(48.5%)
High	67(51.5%)
S. Prolactin	
Normal	90 (69.2%)
High	40 (30.8%)
Random Blood Sugar	
Normal	129 (99.2%)
High	1 (0.8%)
Thyroid function test	
Normal	130 (100%)
High	0 (0%)

In the diagnostic process, more than 80% of cases were diagnosed using needle core biopsy, followed by fine needle aspiration cytology and excisional tissue biopsy (Figure 2).

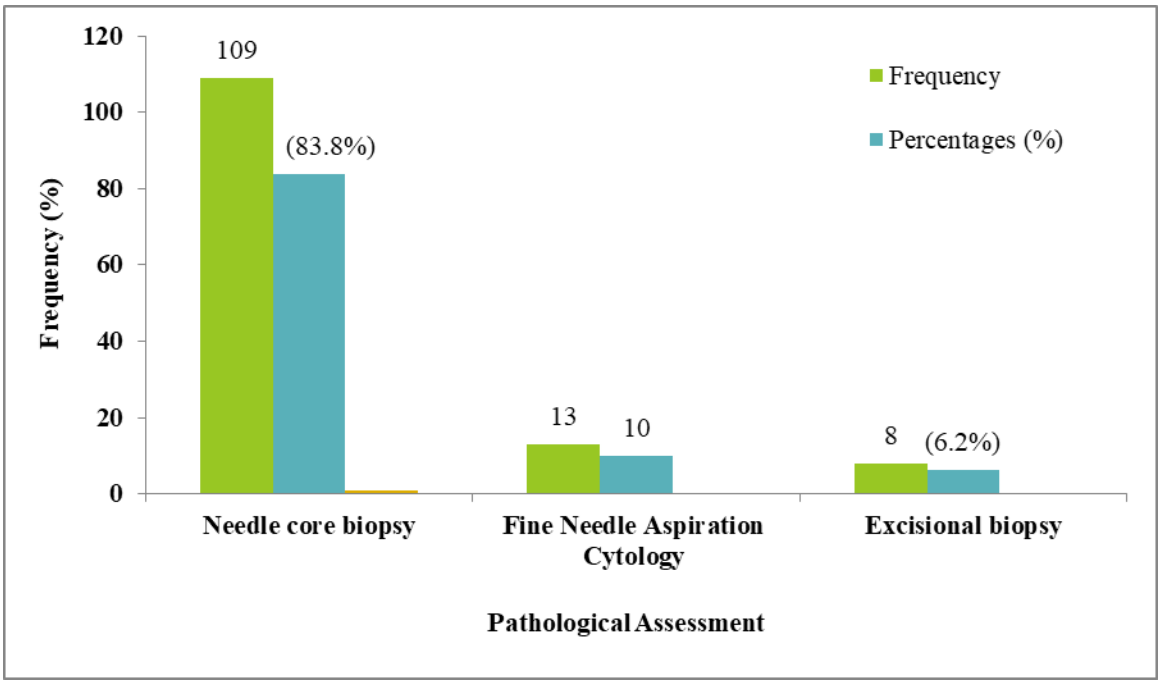

Figure 2: Outcomes of needle core biopsy (NCB), fine needle aspiration cytology (FNAC), and excisional tissue sampling (n=130).

Regarding management strategies and outcomes, patients were categorized into three main groups (medical group, surgical group, and combine medical and surgical group). Initial management primarily involved antibiotics with corticosteroids. If the initial treatment was ineffective, surgical options were considered. Fifty-eight patients received antibiotic with corticosteroids, of whom 54 (93.1%, *P*= 0.001) achieved complete remission. Forty patients underwent drainage or aspiration of pus combined with antibiotics, corticosteroids, and anti-prolactin therapy, and 36 (90.0%, p=0.003) achieved remission. Twenty- four patients underwent wide local excision with antibiotics, and only 10 (41.7%, *p*=0.1) achieved complete remission. Eight patients underwent wide local excision combined with antibiotics and corticosteroids, 6 (75.0%, *p*=0.004) achieved complete remission (Table 3). The overall cure rate among all treatment groups was 106 patients (81.5%) while the recurrence rate was 24 patients (18.5%).

Management plans	Outcomes of treatment		Total, Numbers (percentage)	*p-values*
	Response, frequency (%)	Recurrence, frequency (%)		
Antibiotics +Steroid	54 (93.1%)	4 (6.9%)	58 (100%)	0.001
Wide local excision+ Antibiotics	10(41.7%)	14 (58.3%)	24 (100%)	0.1
Wide local excision+ Antibiotics+ Steroid	6 (75.0%)	2 (25.0%)	8 (100%)	0.004
Drainage+Antibiotics+Steroid+Antiprolactin	36 (90.0%)	4 (10.0%)	40 (100%)	0.003

4 Discussions

The aim of this study was to establish the extreme applicable management strategies for IGM, whether medical therapy alone, surgical intervention alone, or a combined medical-surgical approach in Sulaimanyah, Kurdistan Region, Iraq.

In the current study, the average age of patients was 37.17 years, and more than 60% were between 23 and 40 years of age. This finding is in line with previous studies, in which the majority of women were within the reproductive age range, accounting for 77.9% [3]. This indicates that IGM mostly affects women of reproductive age.

In this cohort, the most common presentations were isolated breast masses (39.2%) and mastalgia associated with a palpable mass (34.6%). This finding is in concordance with the previous reports, in which Patients typically exhibit a painful, hardened, and sensitive mass in the breast that lacks clear boundaries [8] .

Ultrasound findings in this study included abscess formation characterized by irregular hypoechoic wall, ill-defined heterogeneous mass, dilated duct containing movable echoes, edematous parenchyma, and thickening of the skin. The majority of cases (n=124, 95.4%) were classified as (BI-RADS U2-U3), this finding is comparable to previous studies reporting abscess formation in 7% to 54% of cases [1].

Mammographic examination was performed in 52.7% of patients (n=49). Findings included asymmetric and poorly-defined densities, irregular lesion, skin retraction and nipple inversion. Approximately 30.8% (n=40) were categorized as BIRADS-M4. These findings are in agreement with previous studies [5, 11].

Since ultrasound and mammography lack definitive diagnostic specificity, histopathological confirmation is mandatory to exclude malignancy. In this study, the main diagnostic modality was needle Core Biopsy(83.8%) supporting previous literature indicating that needle core biopsy is the ideal way for diagnosis [5].

Management of IGM remains controversial and non-standardized. Therapeutic protocols range from conservative observation and antibiotics therapy to systemic corticosteroids, and surgical intervention [1, 3, 12 & 13]. In this study, no cases showed spontaneous resolution at presentation. This finding differs from some reports suggesting that IGM may be self-limiting and may resolve within several months, particularly in smaller lesions [14-16].

All patients received oral antibiotics during the diagnostic period (10–28 days). For symptomatic relief. However, the role of antibiotics in IGM is mainly supportive [17, 18].

In this study, a basic dose of 40 mg/day prednisolone was administrated for two weeks, followed by gradual tapering over six months in 58 patients , this group demonstrated the highest remission rate of 93.1% [n=54 , p-value= 0.001], which is compatible with previous studies reporting high efficacy rates of corticosteroid therapy up to 87% [3, 19].

No patients in this study received methotrexate, and none experienced steroid-related side effects during follow-up. Methotrexate has been reported to be beneficial in steroid-refractory cases or in patients who develop steroid-related complications. [20].

Among the 24 patients who underwent wide local excision with antibiotics, complete remission was achieved in only 10 (41.7%, p-value =0.1). This supports previous findings that surgery alone is associated with higher recurrence rates which varies from 16% to 50%, and postoperative complications such as sinus formation and impaired wound healing [21]. Surgical excision was performed for cases that are severe and resistant to other treatments, although the results remain uncertain [22].

Combined approaches showed better outcomes. In this study 40 patients who underwent drainage with Antibiotics, corticosteroid and Anti-prolactin therapy, achieved remission in 36 cases (90.0%, p-value= 0.003). In 8 patients treated with wide local excision combined with antibiotics and corticosteroid, remission was achieved in 6 patients (75.0%, p-value= 0.004). These results suggest that multimodal therapy may provide better outcomes than surgery alone .In cases of significant IGM, excision alone may not be justified. However, preoperative treatment with steroids and dopamine agonists may facilitates the possibility of more conservative surgical procedures in the future [2, 8, 10 , 11 , 23 & 24]. . Evidence also suggests that wide local excision combined with en-bloc duct excision provides favorable curative and cosmetic outcomes for patients with refractory disease [25].

The overall cure rate in this study was of 81.5% with a recurrence rate of 18.5%. These findings indicate that there is no definitive standardized treatment for IGM, and management should be individualized according to disease severity and patient condition.

5 Conclusions

Idiopathic Granulomatous Mastitis is an immune-mediated disorder in the mammary gland that is difficult to distinguish from carcinoma of the mammary gland. Histopathological examination is crucial for accurate diagnosis. The findings of this study suggest that conservative medical therapy, either alone or combined with limited surgical intervention, provides higher

remission rates and lower recurrence compared to surgical treatment alone. Therefore, conservative management should be considered the preferred initial treatment strategy. Prospective randomized studies are recommended to establish standardized treatment guidelines. However, due to the retrospective design of this study, standardized management protocols was not provided. Therapeutic decisions were based on surgeons' clinical judgment, which may have influenced treatment selection and outcomes.

Declarations

Ethical consideration

Ethical clearance for this study was formally granted by the Kurdistan Higher Council of Medical Specialties prior to the initiation of data analysis (Reference No. 1610, dated July 03, 2024).

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Conflicts of interest

The author states that there are no possible competing interests, whether financial or otherwise, that pertain to the topics or materials addressed in this manuscript

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