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Idiopathic Granulomatous Mastitis: A Case Series Study

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ABSTRACT

Background & objective: Idiopathic granulomatous mastitis (IGM) is a rare, benign, inflammatory breast disorder that often mimics breast carcinoma or breast abscesses, leading to significant diagnostic and therapeutic challenges. A clear understanding of its presentation and optimal management is vital to prevent misdiagnosis and recurrence.

Methods: This was a retrospective case-series study conducted in the Department of General Surgery at Shahabuddin Medical College Hospital (SMCH), Dhaka, over a three-year period (October 2021– September 2024). A total of 11 female patients (aged 20–45 years) with histopathologically confirmed IGM (non-caseating granulomas, and absence of infectious etiologies) were included. Patient demographics, clinical presentation, diagnostic characteristics, and treatment outcomes were analyzed.

Results: The cohort consisted primarily of young, premenopausal women, with variable presentations ranging from solid, painless masses (mimicking fibroadenoma/carcinoma) to severe, recurrent suppurative disease characterized by chronic abscesses and multiple discharging sinuses. Initial misdiagnosis (fibroadenoma, standard abscess) was common. Rigorous exclusion of tuberculous mastitis (TM) was essential, highlighted by one included case of confirmed TM (Case 6). Conservative medical management with antibiotics and steroids frequently resulted in insufficient improvement or recurrence. In contrast, wide local excision (WLE) was successfully employed in cases of chronic, recurrent, or fistulating IGM (7 out of 12 cases), yielding durable, symptom-free recovery on follow-up.

Conclusion: Idiopathic Granulomatous Mastitis (IGM) presents a heterogeneous clinical and diagnostic challenge. While conservative treatment may be considered for uncomplicated cases, this series strongly suggests that wide local excision should be prioritized for complicated, recurrent, or fistulating IGM to achieve superior and sustained resolution, particularly in endemic areas where exclusion of tuberculous mastitis is paramount.

Key words: Idiopathic Granulomatous Mastitis (IGM), clinical presentation, diagnosis, treatment etc.

ORIGINAL ARTICLE

INTRODUCTION:

Idiopathic granulomatous mastitis (IGM) is an uncommon, benign inflammatory disorder of the breast characterized by the presence of non-caseating granulomas. This condition predominantly affects premenopausal women and manifests with significant clinical symptoms, including painful breast masses, discharge, & localized inflammation. Due to its nonspecific clinical presentation, IGM is frequently misdiagnosed as breast cancer, which can result in unnecessary surgical interventions. A comprehensive understanding of the clinical characteristics, treatment modalities, and patient outcomes associated with IGM is essential to enhance patient care and mitigate the incidence of misdiagnosis.

First described by Kessler and Wolloch in 1972 and elaborated upon in a five-case series by Cohen in 1977, IGM is recognized as a rare and chronic inflammatory condition of the breast.[1,2] The etiology

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of IGM remains elusive; however, it has been associated with various potential precipitating factors, including infections, autoimmune disorders, and medication usage. The annual prevalence of IGM is estimated at 2.4 per 100,000 individuals, with an incidence rate of 0.37%.[3] Its rarity poses diagnostic and therapeutic challenges, as IGM is often diagnosed through the exclusion of more common breast conditions such as carcinoma breast. Although the underlying mechanisms remain poorly understood, milk stasis is believed to play a critical role in the pathogenesis of IGM, which may elucidate its strong association with pregnancy and lactation. Proposed initiating processes include the extravasation of intraluminal secretions, with some evidence suggesting a possible infectious etiology.[4] The condition typically presents as an inflammatory process, often mimicking breast cancer both clinically and radiologically, necessitating biopsy for definitive diagnosis.

Despite advancements in understanding IGM, the optimal treatment approach remains contentious, with significant variability in management strategies ranging from surgical excision to conservative medical treatment involving corticosteroids and immunosuppressants. Currently, conservative management is generally recommended as the first-line treatment, while surgical options are typically reserved for cases that are refractory to medical therapy due to associated morbidity and high recurrence rates.

Existing literature highlights a significant gap in comprehensive case series that detail the clinical features, treatment responses, and outcomes of IGM. The impact of variability in clinical presentation on treatment outcomes is not well understood. Given the rarity and complexity of the condition, systematic documentation and analysis of clinical cases are imperative. This case series aims to examine all aspects of IGM, including patient demographics, pathophysiological mechanisms, clinical presentation and imaging characteristics, histopathological findings, differential diagnosis, and current treatment strategies. The ultimate goal is to establish a knowledge base from a series of IGM cases to improve clinical awareness about different aspects of the disease that may guide future management strategies and enhance patient outcomes.

METHODS:

This retrospective case-series study was conducted in the Department of General Surgery at Shahabuddin Medical College Hospital (SMCH), Dhaka, over a three-year period from October 2021 to September 2024, following approval from the SMCH Ethical Review Committee. The study population comprised female patients aged 18 years or older who were histopathologically diagnosed with idiopathic granulomatous mastitis (IGM), demonstrated non-caseating granulomas consisting of lymphocytes, histiocytes, and giant cells,5 and had infectious etiologies excluded with complete medical records available for review. Exclusion criteria included known causes of granulomatous mastitis (e.g., infections, systemic diseases such as sarcoidosis) and incomplete medical records or insufficient follow-up data. A total of 11 cases were included in the study, for studying various aspects of IGM including patient demographics, pathophysiology, clinical presentation, imaging characteristics, histopathological findings, differential diagnoses, and treatment strategies in our setting.

As the clinical presentation of the disease is typical for mastitis, most patients initially got antibiotics in the beginning of their therapy cascade in the form of a blind antibiotic therapy without any microbiological proof of a bacterial infection. Patients underwent abscess puncture, drainage, or incision depending on the size of the lesion. Microbiological cultures of pus or aspirate were done. Special histochemical stains for AFB and Fungus were also performed. If the culture showed no growth of pathological bacteria and histochemical stains for AFB and Fungus were found negative, an infective cause for the disease was ruled out. The diagnosis of GM was confirmed by histopathology only. The gold standard for diagnosing GM is core needle biopsy of the lesion (with a sensitivity of 96%). Histologic techniques for

the pathologist included the use of hematoxylin and eosin stains, gram stain, and for the differentiation of sarcoidosis or tuberculosis fast stains and Grocott's methenamine silver. Histopathological diagnosis of the disease is characterized by formation of a non-necrotizing granuloma in combination with a localized infiltrate of multi-nucleated giant cells, epithelioid histiocytes, lymphocytes, & plasma cells, occasionally organized sterile micro-abscesses with neutrophilic infiltrates found.

When GM was confirmed on HP examination, there were 2 treatment options. While 1) conservative management was given with a high-dose corticosteroid therapy with prednisolone 30 mg/day for at least 2 months, 2) surgical treatment was employed with wide local excision of inflammatory lump with proper toileting and primary closer of wound under GA. Clinical improvement was assessed through review of medical records, clinical progress, and lab investigation findings. Treatment response was defined as partial response (improvement in all clinically significant symptoms, including pain, swelling, erythema, and induration) or complete response (complete resolution of the aforementioned symptoms). Treatment response was assessed at the initial visit (14 days after commencing therapy), at 2 months of the treatment, and approximately every 3 months afterward.

Case Presentations:

Case 1:

Mrs. Sharmin, a 23-year-old housewife from Agargaon, Dhaka, presented with a painless lump in her left breast, which she reported had been enlarging over 1 year. She initially sought care from a local physician, who diagnosed the case as fibroadenoma. She subsequently presented to our department for better management. Fine-needle aspiration cytology (FNAC) suggested suppurative granulomatous inflammation. Laboratory investigations, including complete blood count (CBC) and C-reactive protein (CRP), were within normal limits. Serological test (MT test) was negative. A left-breast excision biopsy of the lump performed under general anesthesia yielded a histological diagnosis of idiopathic granulomatous mastitis (IGM). Postoperative recovery was uneventful, and on follow-up at nine months after surgery, she has completely recovered.

Case 2:

Rumana Akter, a 35-year-old service holder, presented with pain and discharge of pus on pressure from her left nipple. The overlying skin appeared normal, but a small painful lump was palpable in the left breast. Ultrasonography revealed a fibrocystic lesion with focal inflammatory changes in the left breast. No significant axillary lymphadenopathy was noted. She was initially treated conservatively with antibiotics, anti-inflammatory agents, and corticosteroids for 2 months, but there was no improvement. Fine-needle aspiration cytology (FNAC) of the left breast lump revealed numerous epithelioid cell granulomas, foam cells, lymphocytes, plasma cells, multinucleated giant cells, and fibroblasts in a background of blood, consistent with granulomatous mastitis.

Case 3:

Jannat, a 24-year-old lactating mother, was initially treated as a case of a breast abscess at Comilla Medical College & Hospital. She underwent incision and drainage of the abscess in the left breast, which initially healed, but a new opening developed closer to the initial one. Then she received treatment at a specialized center in Dhaka for four months, where tissue from the left breast was excised and was sent for histopathology, which revealed granulomatous mastitis. Ultrasonography of the breast confirmed the lesion. Laboratory tests showed a total WBC count of 12,500 and CRP of 12 mg/dL, while other investigations including chest X-ray were normal. After arrival to us a local excision of the lump was performed under anesthesia, and histopathology confirmed granulomatous mastitis. The postoperative period was uneventful. Although a seroma developed temporarily, it resolved after aspiration, and the patient fully recovered within one month.

Case 4

Humari Kanom, a 25-year-old lady from Zatrabari, Dhaka, presented with her left-sided breast lump

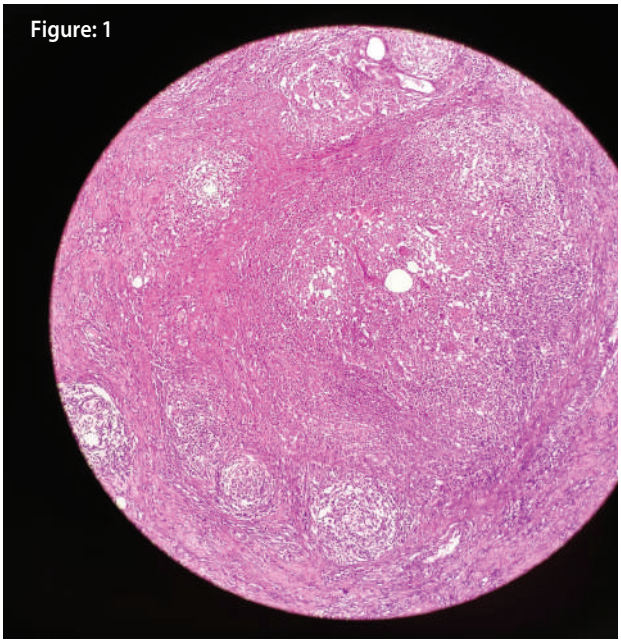
associated with multiple discharging sinuses. She had been receiving conservative treatment for 2–4 years from Asgar Ali Hospital, but repeated infections and discharging sinuses continued to persist. Ultrasonography of both breasts and axilla revealed idiopathic granulomatous mastitis in the left breast with multifocal abscesses and multiple discharging sinuses. Core biopsy of the lump confirmed idiopathic granulomatous mastitis. She was treated with antibiotics and steroids for an extended period, but the condition did not resolve. Subsequently, a wide local excision of the lump was performed by us, and histopathology confirmed the diagnosis. The patient recovered well postoperatively and is currently leading a normal life.

Case 5

Mrs. Asma, a 25-year-old female from Feni, presented with recurrent lumps in the left breast associated with discharging sinuses. She had previously undergone multiple courses of antibiotics and drainage procedures, but the lesions recurred in the same region within one year. Core biopsy of the lump revealed granulomatous inflammation. Ultrasonography of the left breast showed an abscess with mild left axillary lymphadenopathy. Initial incision and drainage were performed but did not result in lasting resolution. Routine investigations including CBC, CRP, and chest X-ray were within normal limits. Subsequently, a wide local excision (lumpectomy) of the lesion was performed. Histopathological examination confirmed idiopathic granulomatous mastitis. The patient recovered well postoperatively.

Case 6

Shaliana Akter, a 20-year-old female, has been under my treatment since September, 2024 with the complaint of a solitary lump in the right breast for the last two years. The lump was painless and gradually increasing in size. On examination, there was a well-defined, firm, mobile, non-tender lump measuring about 2.5 × 1.8 × 1 cm located in the upper outer quadrant near the axillary tail of the right breast. No palpable lymph nodes were found in either axilla, and the overlying skin and nipple appeared normal. The patient also complained of generalized weakness, loss of weight, and loss of appetite. Her complete blood count was within normal limits, but the erythrocyte sedimentation rate (ESR) was raised to 95 mm in the first hour. Core biopsy of the lump revealed multiple epithelioid



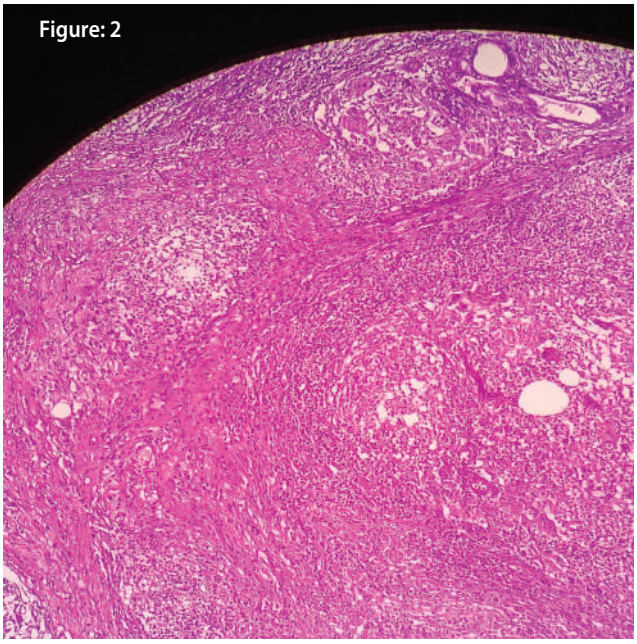


Fig. 1 & 2 showing caseation and granulomatous inflammation of tuberculous mastitis

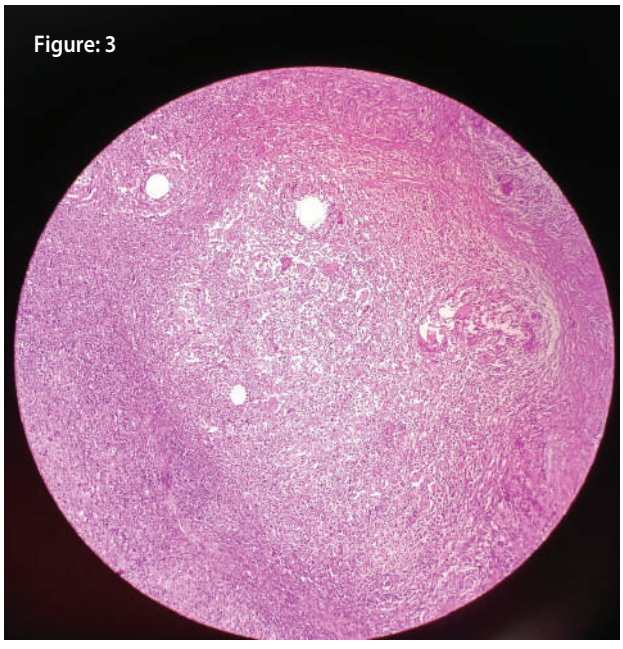
granulomata with areas of caseation necrosis, a finding compatible with tuberculous mastitis. The Mantoux test was negative. The patient was diagnosed as a case of tuberculous mastitis of the right breast and was started on anti-tubercular therapy. She showed clinical improvement with treatment.

Case 7

Shahinor, a 33-year-old female from Mirpur, Dhaka, was under my treatment with the complaint of a painful lump in the left breast associated with some collection. She had been initially treated conservatively with antibiotics, anti-inflammatory agents, and steroids. She stopped breastfeeding during this period. Routine investigations including CBC, chest X-ray (P/A view), and CRP were within normal limits. Core biopsy of the left breast lump revealed chronic granulomatous inflammation suggestive of idiopathic granulomatous mastitis (IGM). The Mantoux test was negative. Despite receiving conservative treatment for several months, her condition did not improve, and multiple sinus tracts developed in different areas of the left breast. Subsequently, wide local excision of the lump was performed. Histopathological examination confirmed chronic granulomatous mastitis. The postoperative period was uneventful, and the wound healed well without any complications.

Case 8

Salma, a 35-year-old female from Noakhali, presented with the complaint of recurrent abscesses in the left breast. Several incision and drainage (I/D) procedures had been performed previously, but the condition did not improve. Ultrasonography of the breast revealed multiple sinus tracts. Excision of the sinus tracts and incision and drainage of abscesses were performed as per surgical guidance, and tissue was sent for histopathological examination. The histopathology report showed multiple small abscess cavities composed of neutrophils, macrophages, and lymphocytes, along with many non-caseating granulomas made up of epithelioid histiocytes, lymphocytes, giant cells, and neutrophils. Most of the ductal structures were found to be obliterated. No evidence of malignancy was seen. These findings were consistent with chronic granulomatous mastitis (idiopathic type). Complete blood count and chest X-ray were normal, and the Mantoux test was



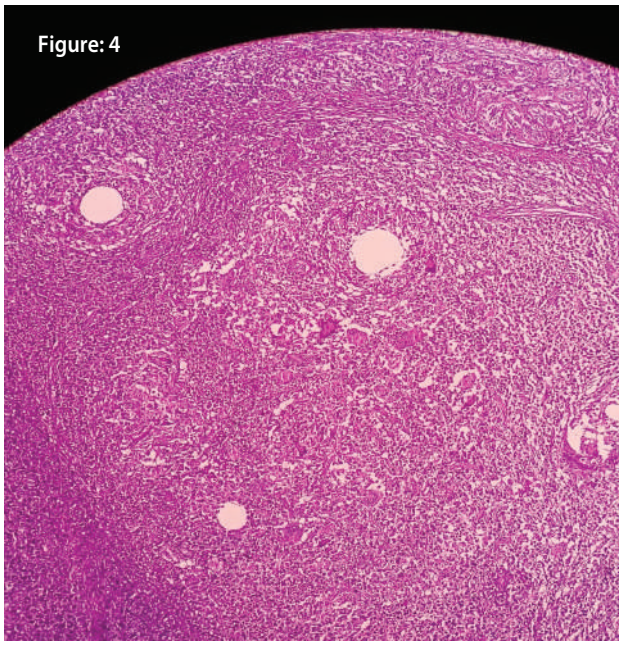


Fig. 3 & 4: Histologic section of breast tissue showing non-caseating granulomas on the breast lobules. There is mixed infiltration of epithelioid histiocytes, multinucleated giant cells, lymphocytes, plasma cells and neutrophils

negative. After surgical excision of the sinus tracts, the patient recovered well and remained symptom-free during follow-up.

Case 9

Mrs. Shamima Akter, a 40-year-old female from Mirpur, presented with a painless lump in the right breast for 2 months. On examination, there was a firm lump involving the central and upper inner quadrant of the right breast, with nipple retraction present but no nipple discharge. No palpable axillary lymph nodes were detected. She was initially treated conservatively with antibiotics but showed no improvement and was later referred to the department of General Surgery, Shahabuddin Medical College Hospital, Dhaka. Ultrasonography of both breasts and axilla revealed a solid lump in the right breast with bilateral axillary lymphadenopathy. Core biopsy showed no malignant cells; cytological findings were consistent with granulomatous mastitis. The Mantoux test was negative, and other routine investigations were within normal limits. Subsequently, excision of the lump was performed. Histopathological examination confirmed idiopathic granulomatous mastitis. The postoperative period was uneventful, and the patient is presently leading normal life free of breast problems.

Case 10

Farjana Akter, a 22-year-old unmarried woman, presented with a painless swelling in the right breast, which had gradually increased in size and become softer over time. On examination, a large lump occupying the entire right breast was noted, with overlying skin color changes. The lump was indurated but non-tender, and axillary lymph nodes were not palpable. Ultrasonography revealed a chronic abscess in the right breast measuring approximately 6 × 8 × 4 cm. Complete blood count was within normal limits, ESR was slightly elevated, and the Mantoux test was negative. Fine-needle aspiration cytology suggested non-tubercular granulomatous mastitis. The patient was initially treated with antibiotics, steroids, and anti-inflammatory agents. The lump decreased in size but did not completely resolve, and therefore excision of the lump was performed. Histopathological examination confirmed a chronic breast abscess with granulomatous mastitis and showed no evidence of malignancy. The patient recovered well postoperatively, and no further treatment was required.

Case 11

Mrs. Nasrin, a 45-year-old female, had a painless lump in her left breast for a long time, which recently became painful and increased in size. She initially consulted a local doctor and received antibiotics and anti-inflammatory medications, but her condition did not change. She was subsequently referred for surgical management. On examination, multiple lumps were noted in both breasts. Ultrasonography revealed a complex cystic mass in the left breast and a fluid-containing cystic lesion in the right breast. One enlarged axillary lymph node was noted on the left side, while the right axillary lymph nodes appeared normal with well-defined cortex and medulla. Complete blood count was largely normal except for a raised ESR. Chest X-ray was unremarkable. The patient was prepared for surgical excision of the left breast lump.

DISCUSSION:

This retrospective case series, comprising 11 patients diagnosed with IGM, a rare and challenging inflammatory disorder of the breast, at Shahabuddin Medical College Hospital over a three-year period, confirms the low incidence rate cited in the literature and provides valuable insights into the spectrum of the disease in the local patient population, particularly concerning its diagnostic pitfalls and treatment outcomes.

Demographics and Clinical Presentation

The clinical data from our series align broadly with established epidemiological trends for IGM. The condition predominantly affected young, premenopausal women, with patient ages ranging from 20 to 45 years. Cases 3 and 7 explicitly mention an association with lactation or recent breastfeeding, supporting the widely accepted hypothesis that IGM pathogenesis involves the extravasation of luminal secretions following ductal injury, potentially

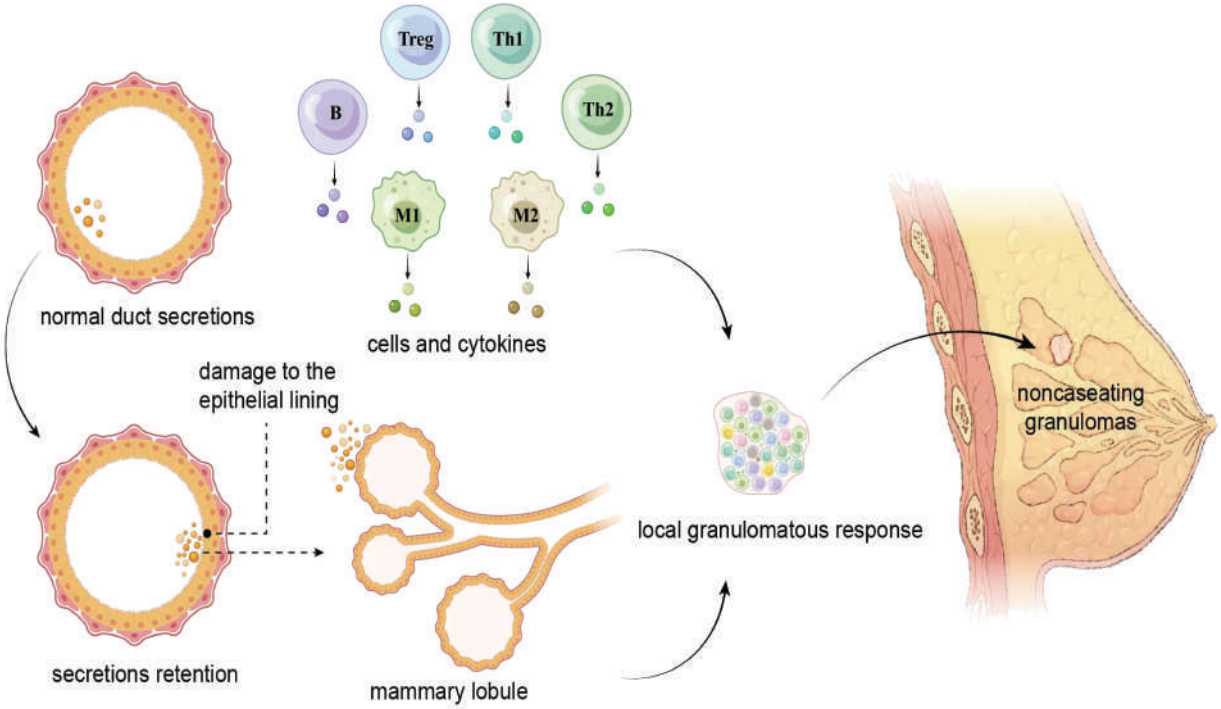


Figure 1: A tentative pathogenic pathway for IGM proposed by Benson and colleagues. The damage of the epithelial lining caused by retention of ductal secretions leads to the leakage of content from the lumen into the surrounding lobular connective tissue, and the extravasation initiates local inflammatory reactions in which lymphocytes and macrophages are involved. These cells migrate to the periductal area, produce cytokines, and trigger a local granulomatous response that pathologically presents with noncaseating granulomas. Th, helper T cell; Treg, regulatory T cell; M, macrophage; B, B lymphocyte (Wang et al., 2024).[6]

exacerbated by milk stasis[4]. However, Case 10, involving a 22-year-old unmarried woman, reinforces the finding in international literature that IGM is not strictly limited to women with a history of pregnancy or lactation, underscoring the "idiopathic" nature of the disease.[6]

The clinical spectrum observed in our cohort was notably heterogeneous. While some patients presented with a firm, solitary lump mimicking a fibroadenoma (Case 1) or carcinoma (Cases 9 and 11), a significant proportion presented with inflammatory features, including chronic abscesses, persistent pus discharge, and multiple discharging sinuses (Cases 3, 4, 5, 7, 8, 10). This severe, suppurative presentation, particularly the protracted course leading to multiple sinuses (Cases 4, 5, 7, 8), contrasts with series that focus primarily on non-inflamed masses. This high incidence of recurrent abscesses and sinuses in our population may reflect a combination of delayed diagnosis or aggressive disease subtype, and necessitates a more proactive approach to treatment compared to conservative management protocols suitable for non-complicated masses.

Diagnostic Challenges and Differential Diagnosis

A central theme in IGM literature is its high rate of initial misdiagnosis, often mistaken for breast carcinoma or common infectious abscesses. Our series illustrates this challenge perfectly: Case 1 was initially diagnosed as fibroadenoma, and Case 3 was treated as a standard breast abscess with incision and drainage, which failed to resolve the condition and led to a recurrent sinus tract. This reaffirms the critical role of histopathological evaluation (core or excision biopsy) to achieve a definitive diagnosis, as clinical & radiological features are often non-specific.

Crucially, our study emphasizes the importance of rigorously excluding specific infectious granulomatous diseases, particularly tuberculous mastitis (TM), given its regional prevalence. The inclusion of Case 6, which was definitively diagnosed as TM based on caseation necrosis in the core biopsy and a high erythrocyte sedimentation rate (ESR), provides a vital comparative element. For all our IGM cases (e.g., Cases 1, 8, 9, 10), infectious etiologies were excluded through negative serological tests (Mantoux) & the histological finding of non-caseating granulomas. The differentiation of IGM from TM based on the presence or absence of caseous necrosis, as demonstrated in our histopathology reports, remains the diagnostic cornerstone.[1,2] The consistent use of the Mantoux test (negative in IGM, and required for exclusion) in our protocol is therefore validated as an essential step, mitigating unnecessary or inappropriate anti-tubercular therapy.

Treatment Modalities and Outcomes

The existing literature highlights significant variability in IGM management, ranging from expectant observation to aggressive surgical excision or prolonged courses of corticosteroids. While conservative medical management (a high-dose corticosteroid therapy with prednisolone 30 mg/day for at least 2 months) is often favored as the first-line approach,[7] our data suggest that for complicated and recurrent disease, surgical intervention provides superior long-term resolution.

Multiple patients in this series (Cases 2, 4, 7, 10) received initial conservative treatment involving antibiotics, anti-inflammatory agents, and corticosteroids, yet demonstrated insufficient or non-lasting improvement. This observation supports studies indicating that corticosteroids, while effective in reducing inflammation in IGM, often result in side effects and high recurrence rates (up to 50% in some series) upon cessation. Therefore, considering both the recurrence rate and side effects, Wang and associates (2024) recommend limiting the total duration of prednisone treatment to approximately 3 months.[8]

In contrast, our cases with complex presentations (abscesses, sinuses, or recurrence), such as Cases 4, 5, 7, 8, 9, and 10, were managed successfully with wide local excision after failed conservative attempts. Most of these surgical cases reported an "uneventful" recovery and sustained resolution upon follow-up. This success with wide local excision contrasts with some older studies that reported high recurrence rates following surgical management alone. Our favorable outcomes suggest that surgical excision, when performed effectively to encompass the entire granulomatous lesion and draining sinuses (as performed in Cases 4, 7, and 8), may be a more durable primary or secondary treatment option for patients with chronic, relapsing, or draining IGM, minimizing the need for prolonged immunosuppression. Furthermore, the early surgical intervention in Case 1 led to rapid and complete recovery, potentially preventing disease progression to the chronic, draining stage.

CONCLUSION:

This case series reinforces the importance of maintaining a high index of suspicion for IGM in premenopausal women presenting with non-specific inflammatory breast lesions, particularly after infectious causes have been ruled out. While conservative medical therapy may be attempted for uncomplicated disease, our experience strongly indicates that wide local excision should be prioritized for recurrent, chronic, or fistulating IGM to achieve optimal, durable outcomes. Our successful differentiation from Tuberculous Mastitis reinforces the essential nature of histopathology in conjunction with clinical and laboratory exclusion of infectious causes. Future studies should focus on long-term, multi-center trials comparing primary surgical excision versus high-dose corticosteroid therapy in patients with complex IGM presentations.

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