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Case Report

Recurrent Sterile Breast Abscesses – A Diagnostic Pursuit: A Case of Idiopathic Granulomatous Mastitis

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Abstract

Introduction: Idiopathic granulomatous mastitis (IGM) is a chronic inflammatory condition that frequently mimics carcinoma or tubercular mastitis, particularly in endemic regions like India. This diagnostic overlap often complicates management, leading to unnecessary surgical interventions or empirical anti-tubercular therapy.

Case Presentation: We report the case of a 28-year-old female presenting with recurrent, sterile abscesses of the right breast. Despite multiple incisions and drainage procedures, pus cultures and extensive molecular tuberculosis (TB) workups (TruNAT/AFB) remained consistently negative. Definitive diagnosis was achieved through repeat surgical biopsies, which revealed non-caseating granulomas consistent with IGM.

Management and Conclusion: Following the rigorous exclusion of tuberculosis and malignancy, the patient was treated with doxycycline (100 mg BD). She demonstrated significant clinical recovery with reduced inflammation and no further recurrence. This case underscores the necessity of diagnostic persistence, utilizing molecular assays and multiple biopsies, to rule out TB, and highlights doxycycline as a viable, effective alternative to corticosteroid therapy.

Key words: Doxycycline, Idiopathic granulomatous mastitis, Non-caseating granuloma, Sterile abscess, TruNAT

INTRODUCTION

Idiopathic granulomatous mastitis (IGM) is a chronic inflammatory condition of the breast that typically affects women of childbearing age.[1] Its etiology remains poorly understood, though autoimmune factors and occult infections (e.g., Corynebacterium) are postulated.[2] In clinical practice, IGM usually presents as a hard mass with skin changes resembling carcinoma, or as recurrent abscesses resembling tubercular mastitis, which is a condition endemic to India.[3] This diagnostic overlap often leads to repeated surgical interventions or empirical anti-tubercular therapy. This case report illustrates the diagnostic persistence required, such as including multiple biopsies and molecular tuberculosis (TB) testing, to correctly identify and manage a case of extensive, recurrent IGM.

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CASE DESCRIPTION AND RESULTS

A 28-year-old multiparous female presented to the Department of General Surgery at St. Martha's Hospital, Bengaluru, with a history of painful swelling and nipple discharge in the right breast for 7 days. Examination revealed an extensive inflammatory mass involving the entire upper quadrant, outer lower quadrant, and the subareolar complex. Induration was present from the 10 to 2 o'clock and 5 to 7 o'clock positions, with associated tenderness, warmth, and edema. Ultrasonography of the right breast showed a few hypo-isoechoic lesions (the largest measuring 36 × 17 × 26 mm) in the right upper inner quadrant with surrounding induration (BIRADS II). She was treated conservatively with intravenous antibiotics, resulting in partial relief.

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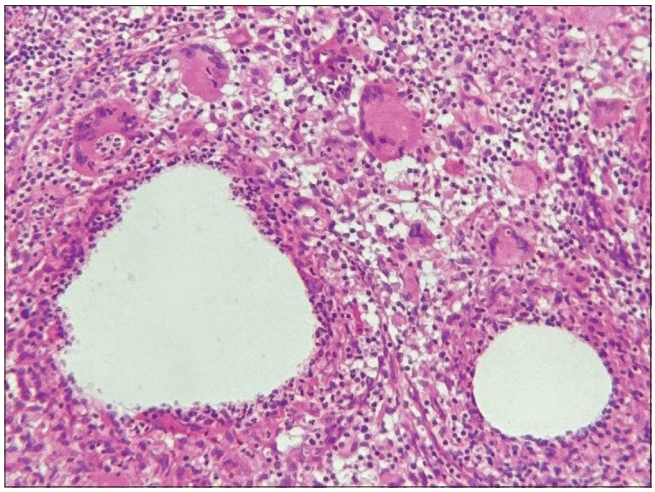

Figure 1: Low-power photomicrograph of the surgical biopsy showing breast parenchyma with non-necrotizing granulomatous inflammation, composed of epithelioid histiocytes and lymphocytes

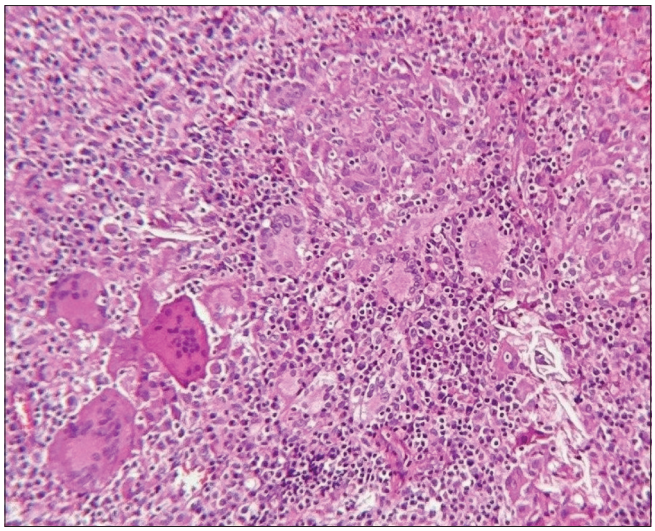

Figure 2: High-power photomicrograph revealing multinucleated giant cells within the granulomas. No caseous necrosis or evidence of malignancy was seen, and acid-fast bacilli stains were negative, confirming the diagnosis of idiopathic granulomatous mastitis

She returned within 7 days with worsening symptoms. A collection and induration were present from 10 to 2 o'clock and 5 to 8 o'clock positions. Ultrasonography revealed a collection (approximately 50–60 mL) involving the central, medial, lateral, and lower portions of the right breast. She underwent incision and drainage, draining 70 mL of pus. A surgical biopsy was performed. Pus culture yielded no growth, AFB and TruNAT MTB polymerase chain reaction (PCR) Assay were negative. In her third admission, she presented with subareolar induration and tenderness. 15 mL of pus was drained from the upper quadrant and 20 mL from the subareolar region. Pus culture was again sterile, and TruNAT MTB PCR Assay came back negative. A repeat biopsy was undertaken to rule out malignancy.

Regarding investigations, pus cultures were repeatedly sterile, despite the presence of large volumes of discharge. Extensive TB workup (ZN staining and TruNAT) was consistently negative for *Mycobacterium tuberculosis*. Due to the aggressive nature of the lesion, surgical biopsies were performed on two separate occasions. Both reports confirmed breast parenchyma showing non-caseating granulomas with epithelioid histiocytes, giant cells, and lymphocytes, consistent with IGM. No evidence of malignancy was found [Figures 1 and 2].

Having ruled out TB and malignancy, the patient was started on doxycycline (100 mg BD). This regimen was chosen for its coverage of potential Corynebacterium species and anti-inflammatory properties.[4] The patient is currently under follow-up and showing clinical signs of recovery with reduced inflammation and no new abscess formation.

DISCUSSION

This case highlights the classic yet frustrating presentation of IGM: The "recurrent sterile abscess." The presence of large pus collections that yield no growth is a hallmark of this condition, often distinguishing it from common bacterial mastitis (usually *Staphylococcus aureus*). The diagnostic burden was high. In the Indian context, a recurrent breast abscess is often presumed to be tubercular until proven otherwise.[5] However, the repeated negative TruNAT results were pivotal. Given the high specificity of the TruNAT molecular assay, a negative result, concomitant with the finding of non-caseating granulomas on biopsy, significantly reduces the likelihood of tuberculosis.

The exclusion of malignancy was equally critical. The involvement of the subareolar complex and skin fixation are "red flags" for cancer. The decision to perform a second biopsy when the clinical picture (aggressive recurrence) did not match the initial pathology (benign) was a prudent surgical decision. Recent literature re-emphasizes that IGM is a diagnosis of exclusion that frequently mimics inflammatory breast cancer, necessitating core needle biopsy for definitive diagnosis.[6]

Regarding management, while corticosteroids are the traditional mainstay, they carry significant side effects. The use of tetracyclines (doxycycline) is an emerging therapeutic option supported by recent studies. A 2020

study by Steuer *et al.* found that doxycycline was successful as a first-line therapy in nearly 50% of patients, likely due to its efficacy against Corynebacterium species and its metalloproteinase-inhibiting anti-inflammatory effects.[7] Our patient's response suggests it is a viable alternative to potentially toxic steroid regimens or disfiguring radical surgery.

CONCLUSION

IGM is a diagnosis of exclusion that demands persistence. In cases of recurrent, sterile breast abscesses involving multiple quadrants, surgeons must aggressively rule out TB and malignancy through molecular testing and repeat biopsies. Once confirmed, conservative management with agents such as doxycycline can yield successful outcomes.

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