

Actinomycotic Granulomatous Mastitis Mimicking Breast Carcinoma: A Diagnostic Challenge

Seema Acharya¹, Saqib Ahmed^{2*}, Shivangi Bhandari³

¹Professor, ²Assistant Professor, ³Post Graduate Student

Department of Pathology, Shri Guru Ram Rai Institute of Medical & Health Sciences, Dehradun, India

Citation: Seema Acharya, Saqib Ahmed, Shivangi Bhandari. Actinomycotic Granulomatous Mastitis Mimicking Breast Carcinoma: A Diagnostic Challenge. Int Clinc Med Case Rep Jour. 2026;5(7):1-4.

Received Date: 13 July 2026; **Accepted Date:** 14 June 2026; **Published Date:** 16 July 2026

***Corresponding author:** Saqib Ahmed, Department of Pathology, Shri Guru Ram Rai Institute of Medical and Health Sciences, Dehradun, India

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ABSTRACT

Granulomatous mastitis is an uncommon benign inflammatory condition of the breast that may closely resemble breast carcinoma in its clinical and radiological presentation. Differentiating between inflammatory breast disease and malignancy can therefore be challenging and often requires histopathological confirmation.

We report the case of a 33-year-old woman who presented with a gradually enlarging swelling in the left breast associated with nipple–areola complex retraction. Sonomammography demonstrated dilated retroareolar ducts with an adjacent irregular collection, and the lesion was categorized as BI-RADS III. Fine-needle aspiration cytology suggested duct ectasia with mastitis, while a core needle biopsy revealed granulomatous inflammation. Due to persistent suspicion of malignancy, the patient underwent wide local excision with oncoplastic reconstruction using a lateral intercostal artery perforator (LICAP) flap. Frozen section examination during surgery was negative for malignancy.

Definitive histopathological examination revealed lobulocentric granulomatous inflammation with suppuration and filamentous branching organisms. Gram staining demonstrated thin, gram-positive, branching bacteria suggestive of Actinomyces. The findings were consistent with suppurative granulomatous mastitis secondary to probable actinomycotic infection.

This case highlights the diagnostic dilemma posed by granulomatous mastitis and underscores the importance of histopathology and microbiological correlation in distinguishing inflammatory breast lesions from malignancy.

Keywords: Granulomatous mastitis; Actinomycosis; Breast lump; Breast carcinoma mimic; Suppurative mastitis

INTRODUCTION

Granulomatous mastitis is a rare benign inflammatory disorder of the breast that frequently mimics carcinoma in both clinical presentation and radiological appearance [1]. The disease most commonly affects women of reproductive age

and typically presents as a unilateral breast mass that may be associated with pain, erythema, nipple retraction, abscess formation, or sinus tract development [2].

The etiology of granulomatous mastitis is diverse and includes infectious, autoimmune, and idiopathic causes. Infectious etiologies include organisms such as *Corynebacterium*, *Mycobacterium*, and rarely *Actinomyces* [3]. Among these, actinomycotic infection of the breast is extremely uncommon but clinically significant because it can closely mimic malignancy.

Radiological findings are often nonspecific, and cytological evaluation may be inconclusive. Consequently, histopathological examination remains the gold standard for establishing the diagnosis and excluding malignancy [4].

CASE PRESENTATION

A 33-year-old woman presented with a gradually enlarging swelling in the left breast. The swelling was located in the upper quadrant and had progressively increased in size over several weeks. It was associated with nipple retraction. The patient did not report fever, weight loss, or other systemic symptoms.

There was no significant past medical history, trauma, addictions, or family history of breast malignancy. On examination, the patient was hemodynamically stable, with a pulse rate of 78 beats per minute and a blood pressure of 110/70 mmHg. Systemic examination was unremarkable. Sonomammography demonstrated dilated ducts in the retroareolar region of the left breast with an adjacent irregular collection suggestive of duct ectasia. The lesion was categorized as BI-RADS III. Fine-needle aspiration cytology suggested duct ectasia with mastitis (IAC Yokohama category C3, probably benign). Subsequently, a core needle biopsy revealed granulomatous inflammation suggestive of chronic granulomatous mastitis. A wide local excision was planned for definitive diagnosis and management. The patient underwent wide local excision (lumpectomy) with Type II mastopexy and oncoplastic reconstruction using a lateral intercostal artery perforator (LICAP) flap. Intraoperatively, a firm mass measuring approximately 4 × 2 cm was identified in the upper quadrant of the left breast, between the 11 and 2 o'clock positions. Wide local excision with a three-dimensional margin of 1 cm was performed. Frozen section analysis showed no evidence of malignancy. Definitive histopathological examination demonstrated lobulocentric inflammation with numerous non-caseating granulomas composed of epithelioid histiocytes, lymphocytes, macrophages, and multinucleated giant cells. Areas of suppuration with cystic spaces were also noted (Figure 1.1 and Figure 1.2). Filamentous branching organisms (Figure 2) were identified, and Gram staining revealed thin gram-positive branching bacteria suggestive of *Actinomyces* (Figure 3). No malignant cells were seen. The postoperative course was uneventful, and the patient recovered well with antibiotic therapy and routine postoperative care.

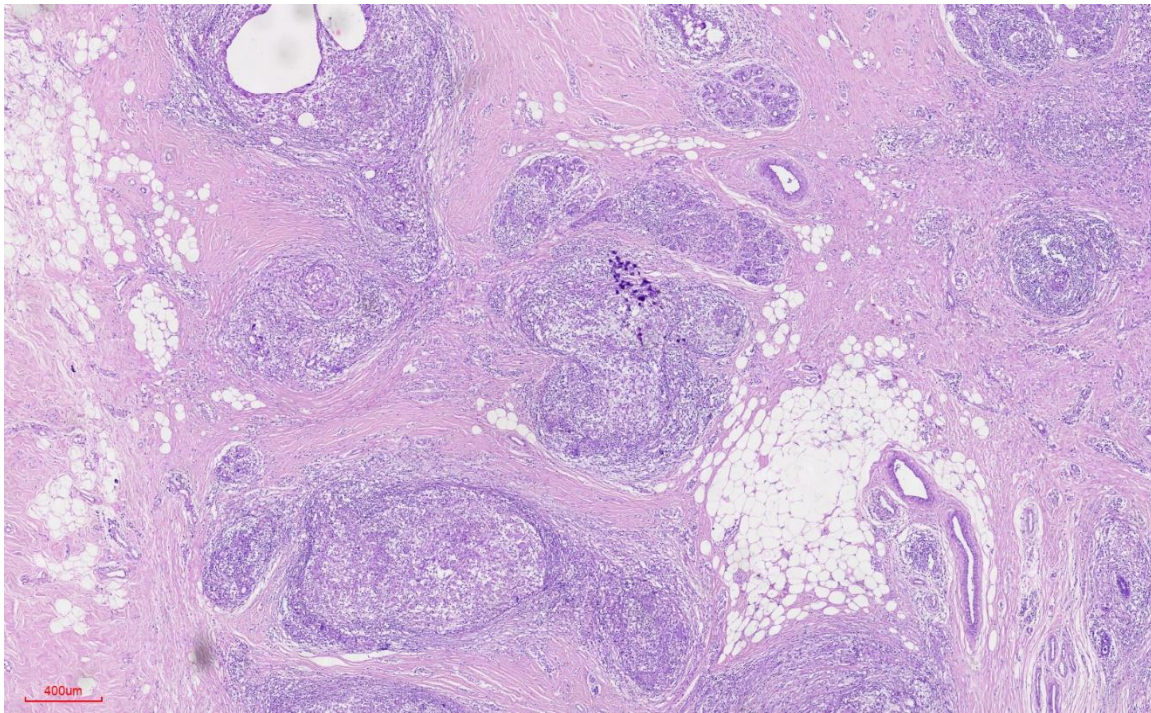


Figure 1.1: Multiple lobulocentric granuloma with suppurative inflammation (H&E, x10)

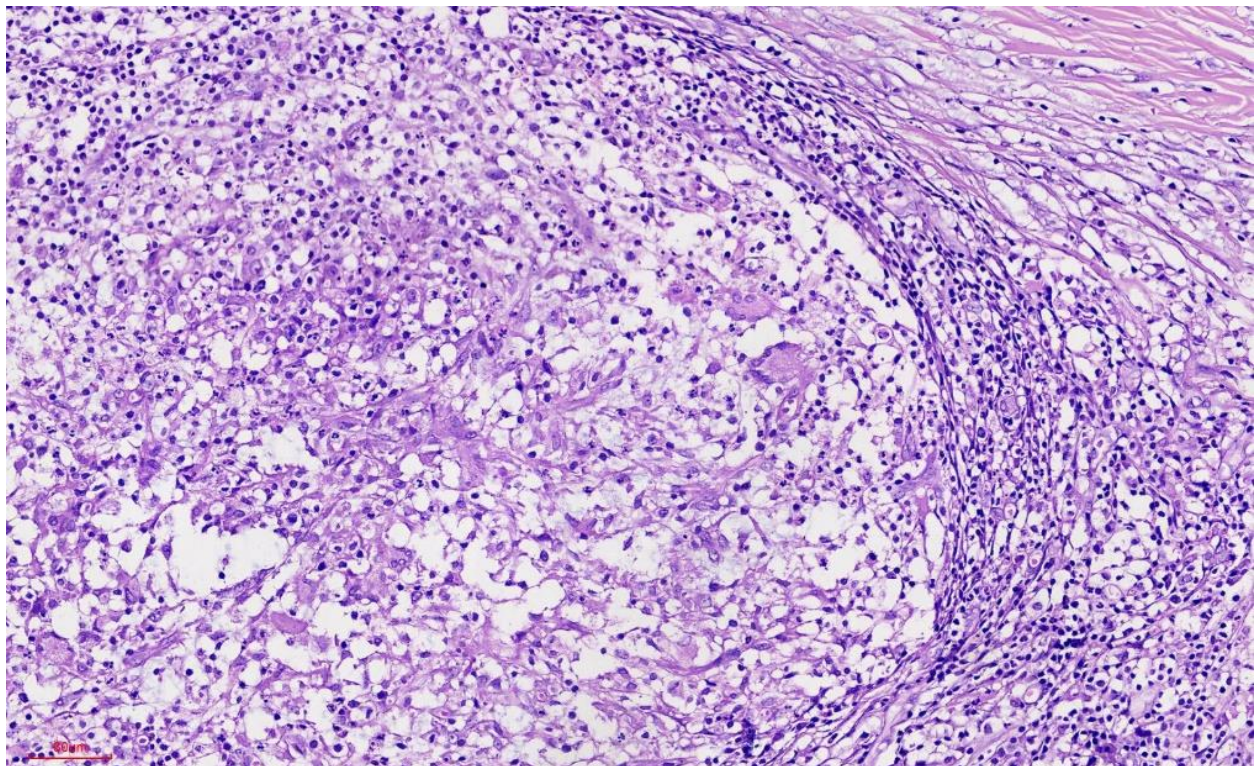


Figure 1.2: Lobulocentric granulomas with Multinucleated giant cells and suppurative inflammation (H&E, x40)

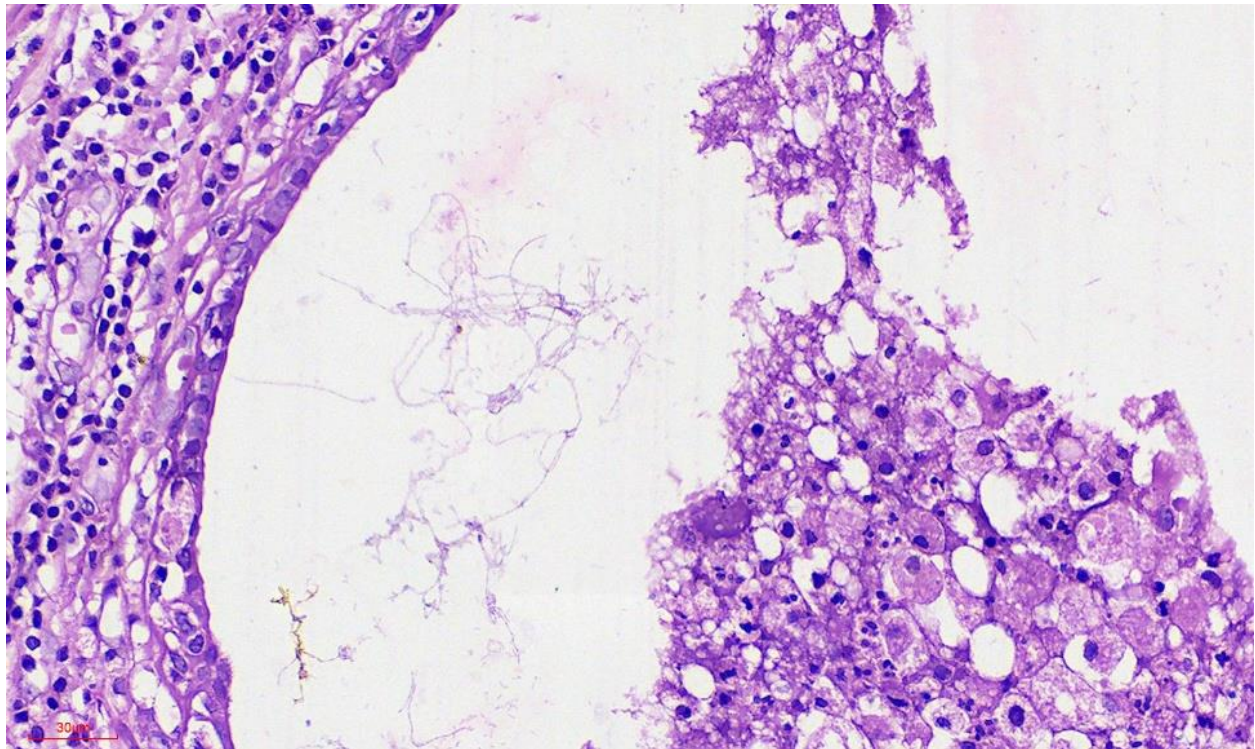


Figure 2: Branching filamentous organism (H&E, x100)



Figure 3: Gram-positive Branching filamentous Actinomyces colonies (Gram stain, x 100)

DISCUSSION

Granulomatous mastitis is an uncommon inflammatory breast condition that frequently poses a diagnostic challenge because it closely mimics breast carcinoma both clinically and radiologically [5]. Patients often present with a firm breast mass, skin changes, or nipple retraction, features that strongly raise suspicion for malignancy.

Actinomyces species are gram-positive, filamentous, branching anaerobic bacteria that normally colonize the oral cavity, gastrointestinal tract, and female genital tract [6]. Breast actinomycosis is rare and may occur through direct inoculation via nipple trauma or secondary spread from thoracic infection.

Histologically, actinomycotic infections show suppurative inflammation with filamentous branching bacteria and occasionally sulfur granules [7]. Identification is aided by Gram staining demonstrating gram-positive branching organisms.

Recognition of this infectious etiology is important because treatment differs significantly from that of malignancy. Management usually involves prolonged antibiotic therapy, commonly penicillin-based regimens, sometimes combined with surgical drainage or excision when necessary [8].

Therefore, granulomatous mastitis and rare infectious causes such as actinomycosis should always be considered in the differential diagnosis of breast masses, particularly in young women.

CONCLUSION

Suppurative granulomatous mastitis secondary to probable actinomycotic infection is a rare condition that may clinically and radiologically mimic breast carcinoma. Histopathological examination, along with appropriate microbiological staining remains essential for accurate diagnosis. Early recognition helps avoid unnecessary aggressive treatment and allows appropriate antimicrobial therapy.

Conflict of Interest- None

Source of Support- None

REFERENCES

1. Brennan M, Morgan M, Heilat G, Kanesalingam K. Granulomatous lobular mastitis: Clinical update and case study. Aust J Gen Pract. 2020;49(1-2):44-47.
2. Manouchehr Aghajanzadeh, Rasool Hassanzadeh, Soheila Alizadeh Sefat, Ali Alavi, Hossein Hemmati, Mohammad Sadegh Esmaeili Delshad, et al. Granulomatous mastitis: Presentations, diagnosis, treatment and outcome in 206 patients. Breast. 2015;24(4):456-460.
3. Bede K, Valente SA. Idiopathic granulomatous mastitis. Ann Breast Surg. 2020;4.
4. Masao Yukawa, Masahiro Watatani, Sayuri Isono, Yoshinori Fujiwara, Masanori Tsujie, Kotaro Kitani, et al. Management of granulomatous mastitis. A Series of 13 Patients Who Were Evaluated for Treatment Without Corticosteroids. Int Surg. 2015;100(5):774-782.
5. Baslaim MM, Khayat HA, Al-Amoudi SA. Idiopathic granulomatous mastitis: A heterogeneous disease. World J Surg. 2007;31(8):1677-1681.

6. Wong VK, Turmezei TD, Weston VC. Actinomycosis. BMJ. 2011;343:d6099.
7. Florent Valour, Agathe Sénéchal, Céline Dupieux, Judith Karsenty, Sébastien Lustig, Pierre Breton, et al. Actinomycosis: Etiology, clinical features, diagnosis and management. Infect Drug Resist. 2014;7:183-197.
8. Kaur N, Gupta A, Saini S. Primary breast actinomycosis: A rare presentation. J Infect Dev Ctries. 2019;13(5):451-454.