

Research Article**Treatment outcomes and recurrence rates in patients with granulomatous mastitis undergoing lumpectomy and anti-tubercular therapy****Dr. Abhinav Puri¹, Dr. Mahim Khan², Dr. Anil Kumar Mongia³**

1. Dr. Abhinav Puri, Asistant Professor, Department of General Surgery, Gautam Buddha Chikitsa Mahavidyalaya and Dr. KKBM Subharti Hospital , Dehradun, Uttarakhand
2. Dr. Mahim Khan, Asistant Professor, Department of General Surgery, Gautam Buddha Chikitsa Mahavidyalaya and Dr. KKBM Subharti Hospital , Dehradun, Uttarakhand
3. Dr. Anil Kumar Mongia, Director Professor and Head , Department of General Surgery, Gautam Buddha Chikitsa Mahavidyalaya and Dr. KKBM Subharti Hospital , Dehradun, uttarakhand

Abstract

Background: Granulomatous mastitis (GM) is an uncommon, persistent inflammatory breast condition that can be difficult to diagnose and treat. It often looks like breast cancer. The goal of this study was to evaluate treatment outcomes and recurrence rates in GM patients undergoing anti-tubercular therapy (ATT) after a lumpectomy. **Methods:** A prospective observational study was conducted on 23 female GM patients at a tertiary care center. Clinical presentations, histological findings, and treatment outcomes following lumpectomy and Category 1 ATT were investigated during a one-year follow-up. **Results:** The mean age of patients was 33 ± 5 years, with lump sizes ranging from 3 to 5 cm and average symptom duration of 3 months. All patients presented with progressively enlarging breast lumps; three had non-healing ulcers and one had a discharging sinus. Twenty-two patients underwent lumpectomy, with histopathology confirming granulomatous mastitis featuring Langerhans giant cells, epithelioid cells, and chronic inflammation. All received six months of ATT. Two patients who defaulted on treatment experienced recurrence within 2–3 months, requiring re-lumpectomy and ATT re-initiation. The remaining 20 remained recurrence-free at one year. One patient treated initially with ATT alone had a recurrence after 3 months, responded well to subsequent lumpectomy and ATT, and remained recurrence-free thereafter. **Conclusion:** Granulomatous mastitis can be successfully treated with a lumpectomy and a complete regimen of ATT; with consistent treatment adherence, the risk of recurrence is very low. Non-compliance with therapy remains a significant risk factor for the recurrence of illness.

Keywords: Granulomatous mastitis, Lumpectomy, Anti-tubercular therapy

Introduction

The rare, chronic inflammatory breast situation known as granulomatous mastitis (GM) primarily impacts women who are of reproductive age [1]. It seems clinically as an uncomfortable breast mass and can be challenging to diagnose due to the frequently mimics cancer both clinically and

radiologically [2]. Non-caseating granulomas, lobulocentric inflammation, and the lack of cancer are histological characteristics of GM [3]. The illness may be related to infections, autoimmune diseases, or foreign body reactions, or it may be idiopathic (idiopathic granulomatous mastitis, IGM) [4]. In endemic areas, where tuberculous mastitis is still a crucial differential diagnosis, tuberculosis (TB) is the infectious cause of particular concern [5].

Although being unusual, tuberculous mastitis frequently goes undiagnosed because of its unclear clinical presentation and low level of suspicion. Accurate diagnosis depends on microbiological confirmation using acid-fast bacilli staining, culture, or nucleic acid amplification tests like GeneXpert. The disease may coexist with or mimic idiopathic GM. Inadequate treatment and a higher risk of recurrence may result from incorrectly identifying the tuberculous etiology [6,7].

Granulomatous mastitis treatment is still debatable. Antibiotics, corticosteroids, immunosuppressants, surgical excision, anti-tubercular therapy (ATT), and observation are just a few of the many different treatment approaches. While surgical procedures like lumpectomies are frequently used to manage abscesses, persistent masses, or diagnostic uncertainty, ATT serves as the cornerstone of treatment in cases where GM is secondary to TB [8, 9]. The best order and combination of medical and surgical procedures is still unknown. The etiology and treatment approach are known to affect recurrence rates; idiopathic cases are said to exhibit higher recurrence rates than tuberculous cases treated with the proper ATT.

In settings with limited resources and high TB prevalence, it is essential to differentiate idiopathic from tuberculous GM and identify the most effective treatment strategies to enhance patient results and reduce recurrence. Although lumpectomy can offer symptom relief and assist in diagnosis, incorporating ATT in confirmed tuberculous cases is crucial for eradicating the disease. This research intends to assess the treatment results and recurrence rates in patients with granulomatous mastitis who are receiving lumpectomy alongside tuberculosis therapy. This study aims to enhance evidence-based management protocols for GM by evaluating clinical resolution, recurrence, and long-term follow-up information.

Materials and Methods

This was a forward-looking observational study carried out at the Department of Surgery, Dr. K.K.B.M. Subharti Hospital, Dehradun, a tertiary care facility in Uttarakhand, India. The research timeframe spanned from 1st May 2022 to 30th March 2025. Ethical clearance was granted by the Institutional Ethics Committee of Dr. K.K.B.M. Subharti Hospital. All participants provided informed consent before being enrolled in the study. Study Population: The study comprised 23 female patients who were clinically and radiologically diagnosed with granulomatous mastitis. All patients displayed breast lumps and underwent assessment for potential tuberculous cause.

Inclusion Criteria: The research encompassed female patients aged 18 and older who exhibited breast lumps that were clinically and radiologically indicative of granulomatous mastitis. Only patients who received a lumpectomy followed by histopathological confirmation of granulomatous mastitis were included. Moreover, all chosen patients had undergone a complete 6-month regimen of first-line anti-tubercular therapy (ATT).

Exclusion Criteria: The exclusion criteria encompassed patients with histologically verified cancer, individuals with granulomatous mastitis resulting from fungal or other non-tuberculous

infections, and those who either did not finish anti-tubercular therapy (ATT) or were lost to follow-up.

Clinical Assessment and Investigations: Each patient received a comprehensive clinical examination of both breasts and the axillary areas. Diagnostic imaging, such as ultrasound and mammography (USG mammogram), was conducted to assess lesion features and exclude malignancy. Furthermore, Fine Needle Aspiration Cytology (FNAC) of the breast mass was performed for initial cytological evaluation.

Surgical Treatment: Every patient had a lumpectomy performed under general anesthesia. The removed tissue was sent for histopathological examination (HPE) to verify the diagnosis of granulomatous mastitis and to assess for the existence of tuberculous granulomas, caseous necrosis, or additional signs of chronic inflammation.

Medical Management: All patients were started on standard first-line anti-tubercular therapy (ATT) after histological confirmation. This involved two months of intense treatment with isoniazid, rifampicin, pyrazinamide, and ethambutol, followed by four months of continuing treatment with isoniazid and rifampicin, for a total of six months of treatment.

Follow-up and Outcome Assessment: Throughout therapy and after its conclusion, patients were clinically monitored at regular intervals to evaluate symptom remission and track recurrence. During the follow-up period, recurrence was defined as the reemergence of clinical or radiological symptoms of mastitis in the same or opposite breast.

Results

There were 23 female patients with granulomatous mastitis in all, and their mean age was 33 ± 5 years. The mean size of the lump was 3 to 5 cm, and the average duration of symptoms prior to presentation was 3 months. Every patient had a steadily growing breast lump when they first arrived. Three had drainage and non-healing ulcers after the incision, and one had a sinus that was discharging. Following a lumpectomy in twenty-two patients, histopathology revealed granulomatous mastitis accompanied by Langerhans giant cells, epithelioid cells, and persistent inflammation. All 22 began receiving six months of Category 1 anti-tubercular therapy (ATT). Although there was no further recurrence, two patients who had defaulted experienced recurrence within two to three months, necessitating a re-lumpectomy and ATT reinitiation. After a year, the other 20 patients had not experienced any recurrences. One patient whose symptoms were initially resolved with ATT alone experienced a recurrence three months after treatment. After having a lumpectomy, she resumed ATT and hasn't had another recurrence. Table 1 summarizes the results.

Table 1: Summary of Patient Demographics, Clinical Features, Treatment, and Outcomes

Parameter	Value / Number of Patients (n = 23)
Mean age (years)	33.5
Average duration of symptoms before presentation	3 months

Average lump size	3.5 cm
Most common presenting symptom	Breast lump (progressively increasing) – 23
Patients with non-healing ulcer post I&D	3
Patient with discharging sinus (no prior Incision and Drainage)	1
Patients who underwent lumpectomy	22
Histopathology findings	Langerhans giant cells, epithelioid cells, other cells of chronic inflammation
Patients started on ATT (Category 1, 6 months)	22
Patients who defaulted ATT and had recurrence	2
Patients with re-lumpectomy and restarted ATT	2
Recurrence-free after 1-year follow-up	21
Patient managed with ATT alone (no surgery)	1
Recurrence in ATT-only patient (managed later with surgery + ATT)	1

Discussion

Granulomatous mastitis continues to pose a diagnostic and treatment challenge, especially in areas where tuberculosis is prevalent. In this research, we assessed the treatment results and recurrence rates in 23 patients treated with lumpectomy and anti-tubercular therapy (ATT). The average age of the patients was 33.5 years, aligning with earlier studies indicating that GM predominantly impacts women in their reproductive years [10]. The typical duration of symptoms prior to presentation was 3 months, with the most prevalent symptom being a slowly increasing breast lump [11]. Importantly, multiple patients exhibited complications like non-healing ulcers and sinuses, frequently after previous incision and drainage surgeries performed at other places. Same presentation was present in previous studies [12]. This underscores the risk of misdiagnosis and insufficient treatment in primary care environments. In 22 out of 23 patients, histopathology validated granulomatous inflammation, showing epithelioid cells, Langerhans giant cells, and a chronic inflammatory infiltrate, aligning with tuberculous mastitis [13] as reported in earlier studies also. Each of these patients underwent surgical excision (lumpectomy) and subsequently received Category 1 ATT for a duration of 6 months. Among the 22 patients who received surgery and medical treatment, 20 finished the entire course and experienced no recurrence at the one-year follow-up, demonstrating a high success rate (91.3%) with the combined approach. Similar reports were also shown by various researchers [14,15]. Two patients discontinued ATT and faced recurrence, necessitating another lumpectomy and resumption of treatment. This highlights the essential significance of following treatment protocols in TB-related mastitis. The sole patient who

was treated solely with ATT, without any surgical intervention, experienced a recurrence after 3 months post-therapy completion. She ultimately needed a lumpectomy and a subsequent round of ATT, after which she stayed free of recurrence. This situation indicates that medical treatment by itself might be inadequate, especially in instances with confirmed lesions or sinus development. Our results back the increasing agreement that a combination of surgical and medical treatment provides the optimal results in tuberculous GM [16]. Surgical excision permits total removal of the lesion, aids in histopathological diagnosis, and diminishes the mycobacterial load, while ATT eliminates any remaining infection

Conclusion

For individuals with granulomatous mastitis of tuberculous origin, this study shows that lumpectomy followed by anti-tubercular therapy is a dependable and successful therapeutic strategy. Patients who finished treatment had a low recurrence rate, highlighting the need of adherence. Recurrence was greater in those treated with ATT alone or with insufficient treatment. Therefore, for the best treatment of granulomatous mastitis in areas where tuberculosis is endemic, a multidisciplinary strategy combining surgery and medication therapy is crucial.

Conflict of Interest: With relation to the publication of this paper, the authors affirm that they have no conflicts of interest.

Acknowledgment: The resources and support needed to conduct this prospective observational study were provided by the For their tremendous help and collaboration during this research, I would like to sincerely thank the Department of Surgery at Dr. K.K.B.M. Subharti Hospital, Dehradun, a prestigious tertiary care hospital in Uttarakhand, India. Their direction, clinical knowledge, and resource availability were crucial to this study's effective conclusion. I would especially like to express my gratitude to the faculties and other staff members for their unwavering support and encouragement throughout the project.

References

1. Wolfrum A, Kümmel S, Theuerkauf I, Pelz E, Reinisch M. Granulomatous Mastitis: A Therapeutic and Diagnostic Challenge. *Breast Care (Basel)*. 2018 Dec;13(6):413-418. doi: 10.1159/000495146
2. Bakaris S, Yuksel M, Ciragil P, Guven MA, Ezberci F, Bulbuloglu E. Granulomatous mastitis including breast tuberculosis and idiopathic lobular granulomatous mastitis. *Can J Surg*. 2006 Dec;49(6):427-30.
3. Zhou F, Yu LX, Ma ZB, Yu ZG. Granulomatous lobular mastitis. *Chronic Dis Transl Med*. 2016 Apr 22;2(1):17-21. doi: 10.1016/j.cdtm.2016.02.004.
4. Dilaveri C, Degnim A, Lee C, DeSimone D, Moldoveanu D, Ghosh K. Idiopathic Granulomatous Mastitis. *Breast J*. 2024 Jan 25;2024:6693720. doi: 10.1155/2024/6693720.
5. Köseoğlu Hİ, Daşiran MF, Köseoğlu RD, Çelikyay ZRY, Kalelioğlu MB. Is it tuberculosis mastitis or granulomatous mastitis? A thirteen-year experience at a university hospital. *Turk J Med Sci*. 2023 Jun;53(3):744-751. doi: 10.55730/1300-0144.5637.
6. Agarwal C, Singh K, Pujani M, Raychaudhuri S, Sharma N, Chauhan V. Are all Granulomatous Mastitis Cases Tuberculous?: A Study on the Role of Cytology in Evaluation

- of Granulomatous Mastitis. *Turk Patoloji Derg.* 2019;35(2):128-133. English. doi: 10.5146/tjpath.2018.01442.
7. Patel OA, Bakhshi GD, Nadkarni AR, Rangwala ZS. Granulomatous Mastitis Due to Non-Tuberculous Mycobacteria: A Diagnostic and Therapeutic Dilemma. *Clin Pract.* 2021 Apr 14;11(2):228-234. doi: 10.3390/clinpract11020034.
 8. Liu L, Zhou F, Zhang X, Liu S, Liu L, Xiang Y, Guo M, Yu L, Wang F, Ma Z, Li L, Gao D, Zhang Q, Fu Q, Yu Z. Granulomatous Lobular Mastitis: Antituberculous Treatment and Outcome in 22 Patients. *Breast Care (Basel).* 2018 Oct;13(5):359-363. doi: 10.1159/000487935.
 9. Emiroglu M, Cetin K, Yilmaz KB, Velidedeoglu M, Girgin S, Akcan A, et al., Idiopathic Granulomatous Mastitis: A Consensus Report on Treatment and Follow-Up Approaches Based on the Turkish Clinical Classification. *Breast Care*, 2025. <https://doi.org/10.1159/000544967>.
 10. Zeng Y, Zhang D, Fu N, Zhao W, Huang Q, Cui J, Chen Y, Liu Z, Zhang X, Zhang S, Mansoor KM. Risk Factors for Granulomatous Mastitis and Establishment and Validation of a Clinical Prediction Model (Nomogram). *Risk Manag Healthc Policy.* 2023 Oct 20;16:2209-2222. doi: 10.2147/RMHP.S431228.
 11. Brennan ME, Morgan M, Heilat GB, Kanesalingam K. Granulomatous lobular mastitis: Clinical update and case study. *Aust J Gen Pract.* 2020 Jan-Feb;49(1-2):44-47. doi: 10.31128/AJGP-08-19-5042.
 12. Tsang EW, Gao J, Lo CN, Trapp NT, Boes AD, Sik H. Effects of mindfulness meditation on human impulsivity: a systematic review and meta-analysis. *Academia Mental Health and Well-Being.* 2025;2(1). doi:10.1016/J.AMSU.2022.103587.
 13. Punyashetty K B, Patil T, Singh C. Granulomatous Mastitis: A Masquerading Entity. *Indian Journal of Pathology: Research and Practice*, 2017(Part 2);6(2), 398-403. DOI: <http://dx.doi.org/10.21088/ijprp.2278.148X.6217.10>
 14. Zhang X, Li J, Hu XJ. Postoperative Yanghe decoction regimen improves outcomes for idiopathic granulomatous mastitis: A retrospective cohort study. *Medicine (Baltimore).* 2020 Nov 6;99(45):e23136. doi: 10.1097/MD.00000000000023136.
 15. Sawuer R, Wu C, Sun Z, Liu S. The Effectiveness of Traditional Chinese Medicine Combined With Surgery to Treat Granulomatous Mastitis: A Propensity-Matched Analysis. *Front Oncol.* 2022 Feb 10;12:833742. doi: 10.3389/fonc.2022.833742.
 16. Yuan, QQ., Xiao, SY., Farouk, O. et al. Management of granulomatous lobular mastitis: an international multidisciplinary consensus (2021 edition). *Military Med Res* 9, 20 (2022). <https://doi.org/10.1186/s40779-022-00380-5>