

Research Article / Araştırma Makalesi

Evaluation of Surgical Treatment and Intraoperative Local Steroid Application Outcomes in Granulomatous Mastitis

Granülatöz Mastitte Cerrahi Tedavi ve İntrooperatif Lokal Steroid Uygulamasının Sonuçlarının Değerlendirilmesi

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Abstract: Granulomatous mastitis is a rare benign inflammatory disease of the breast. Although the etiology of granulomatous mastitis is not known exactly, it can be confused with breast cancer due to its findings and appearance. In addition, this disease, which is characterised by inflammation, causes recurrent infections and considerable tissue loss if left untreated. Therefore, diagnosis and early treatment are very important. In our study, we aimed to show the results of intraoperative local steroid administration after surgical resection in the treatment of patients with granulomatous mastitis. In our study, the hospital records and files of 39 patients diagnosed with granulomatous mastitis and treated with surgical treatment and intraoperative local steroid administration were retrospectively analysed. Age, gender, radiological and laboratory findings, surgical methods, postoperative recurrence rates and histopathological features were noted. Success rates were investigated and it was observed that intrathecal steroid treatment given after resection decreased recurrence. As a result, it was concluded that surgical wide or total excision and intraoperative local steroid administration would be the most appropriate treatment for the definitive treatment of granulomatous mastitis. Although abscess drainage and antibiotic treatment is effective in rare cases, surgical treatment should be preferred in chronic and complicated cases.

Keywords: Idiopathic, granulomatous mastitis, steroid

Özet: Granülatöz mastit, memenin nadir görülen benign inflamatuvar hastalıklarından biridir. Granülatöz mastit etyolojisi tam olarak bilinmese de bulgular ve görünüm nedeniyle meme kanseri ile karışabilmektedir. Bunun yanında inflamasyonla seyreden bu hastalık tedavi edilmez ise tekrarlayan enfeksiyonlara ve oldukça büyük doku kaybına neden olmaktadır. Bu nedenle tanı konulması ve erken tedavi edilmesi oldukça önemlidir. Biz de çalışmamızda granülatöz mastitli hastaların tedavisinde cerrahi rezeksiyon sonrası intraoperatif lokal steroid uygulamasının sonuçlarını göstermeyi amaçladık. Çalışmamızda granülatöz mastit tanısı almış ve cerrahi tedavi ile intraoperatif lokal steroid uygulanmış 39 olgunun hastane kayıtları ve dosyaları retrospektif olarak incelendi. Olguların yaş, cinsiyet, radyolojik ve laboratuvar bulguları, cerrahi yöntemleri, cerrahi sonrası nüks oranları ve histopatolojik özellikleri not edildi. Başarı oranları araştırıldı ve rezeksiyon sonrasında verilen intratekal steroid tedavisinin nüksü azalttığı gözlemlendi. Bunun sonucunda granülatöz mastitlerin kesin tedavisi için cerrahi olarak geniş veya total eksizeyon ile intraoperatif lokal steroid uygulaması en uygun tedavi olacağı kanaatine varılmıştır. Nadir olgularda apse drenajı ile antibiyotik tedavisi etkin olmakla beraber, kronikleşen ve komplike olmuş vakalarda cerrahi tedavi tercih edilmelidir.

Anahtar Kelimeler: İdiopatik, granülatöz mastit, steroid

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1. Introduction

Granulomatous mastitis (GM) is a rare benign inflammatory disease of the breast, first described by Kessler and Wolloch (1). GM is classified into two types: idiopathic GM (IGM) and specific GM (SGM). Idiopathic GM is defined as GM with an undetermined etiology, while specific GM is a complication secondary to foreign body reactions, bacterial, parasitic, rheumatologic, vasculitic, and fungal diseases (2-4).

The initial clinical manifestation of GM is typically a tender and firm breast mass. As the disease progresses, it presents with local pain, tenderness, inflammation, skin ulcerations and indurations, galactorrhea, abscess formation, and fistulas. In most cases, there is a fixed mass to the skin and retraction of the nipple. This clinical presentation often mimics breast cancer, necessitating biopsy for early and accurate diagnosis (5-8).

IGM usually develops postpartum and has an unknown etiology. However, autoimmune diseases, an excessive immune response secondary to local trauma, oral contraceptive use, local infectious agents (viruses, mycotic, and parasitic infections), and hyperprolactinemia are hypothesized to be potential causes. Diagnosis is made histologically by identifying non-caseating granulomatous inflammation. IGM is unilateral in 75% of cases and rarely causes axillary lymphadenopathy (5-6). There are no pathognomonic findings in breast imaging. While a definitive treatment protocol has not been established, corticosteroid therapy, colchicine, methotrexate, azathioprine, and wide surgical excision are potential treatment options (9-11).

SGM can occur at any age, with sarcoidosis and tuberculosis being the most common causes. In sarcoidosis, histological examination reveals non-caseating granulomas and giant cells. The primary medical treatment is corticosteroids, alongside treatment for the underlying disease, with wide surgical excision necessary for complicated cases (2-4). Breast tuberculosis, although accounting for only 0.1% of all breast diseases, is a treatable condition.

Histologically, it presents with caseous necrosis, epithelioid histiocyte granulomas, and Langhans giant cells. Treatment includes 6-12 months of antituberculosis therapy and wide surgical excision (12-14).

This study aims to determine the efficacy of surgical treatment combined with intraoperative local steroid application in all cases of granulomatous mastitis.

2. Materials and Method

In this study, 39 patients who underwent breast surgery with local steroid application and were histologically diagnosed with granulomatous mastitis at the Department of General Surgery, Eskişehir Osmangazi University Faculty of Medicine Hospital, between May 2014 and September 2022, were evaluated retrospectively. All records and files from the patients' initial presentations to their recurrence status within the first year were reviewed. The patients' age, gender, medical history, physical examination findings, radiological and laboratory data, type of surgery, and recurrence were evaluated.

3. Results

The study group included 39 female patients with an average age of 34.49 years (range: 22-57 years) who were treated for granulomatous mastitis between May 2014 and September 2022. Among these, 37 patients had idiopathic granulomatous mastitis, and 2 had tuberculosis mastitis. Five patients were postmenopausal, 7 had never given birth, 25 had given birth within the last 6 years, and 2 were in the lactation period. 18 patients had a history of smoking and 11 patients had a history of alcohol use. Polycystic ovary syndrome was present in 2 patients, hypothyroidism in 6, Wegener's granulomatosis in 1, hyperprolactinemia in 1, hypertension in 8, and diabetes mellitus in 6 patients (Table 1).

The disease was detected in the right breast in 15 patients and in the left breast in 24 patients. At initial presentation, 16 patients had a mass

and purulent discharge, 7 had pain and swelling, and 16 had only a palpable mass.

Ultrasonography generally showed hypoechoic, heterogeneous lesions with unclear borders. There were areas of diffuse edematous and inflammatory changes with ductal ectasia. Mammograms revealed areolar and periareolar skin thickening, irregularly contoured asymmetric glandular opacities. Breast MRI, performed on a single patient, showed abscess formation.

Based on imaging results, six patients with lesions suspicious for malignancy had preoperative biopsy results indicating no malignancy.

Twenty patients underwent segmental mastectomy, 17 underwent excisional biopsy, 1 underwent total mastectomy, and 1

underwent abscess drainage, with all patients receiving intralesional local steroid application during the procedure. Intraoperative cultures were performed for all patients. Culture results showed coagulase-negative staphylococci in 6 patients, diphtheroid bacilli in 4, and *Staphylococcus hominis* in 2, with no growth in other cultures.

Histopathologically, 37 patients were confirmed to have idiopathic granulomatous mastitis, and 2 patients had tuberculosis mastitis.

Postoperatively, cellulitis developed in 3 patients, and negative pressure wound therapy (VAC) was used in 1 patient. Two patients experienced recurrence from the drain site within one year, requiring surgical re-excision. No recurrence was observed in the other patients.

Table 1. Demographic Features, Surgical Procedure and Comorbid Diseases.

Variables	n=39	%
Ages (mean/median)	34.49/35	
Smoking history	18	46.15
History of alcohol use	11	28.2
Surgical procedure		
Segmental mastectomy	20	51.28
Excisional biopsy	17	43.58
Abscess drainage	1	2.56
Total mastectomy	1	2.56
Menstrual status		
Pregnancy history	25	64.1
Nulliparous	7	17.94
Postmenopausal	5	12.82
Lactational Period	2	5.12
Location		
Left breast	24	61.53
Right breast	15	38.46
Comorbid illness (n=26)		
Hypertension	8	20.51
Hypothyroidism	6	15.38
Diyabetes	6	15.38
Polycystic ovary syndrome	2	5.12
Wegener's disease	1	2.56
Hyperprolactinemia	1	2.56

4. Discussion

Granulomatous mastitis (GM) is a rare benign breast disease that can mimic breast cancer, first described by Kessler and Wolloch (1). The most extensive study in the literature was

conducted by Al-Khaffaf et al., involving 133 patients treated over 25 years (15). GM has two forms: idiopathic GM (IGM) and specific GM (SGM). SGM can develop secondary to

tuberculosis, sarcoidosis, Wegener's granulomatosis, syphilis, Corynebacterium infection, foreign body reaction, vasculitis, fungal, and parasitic infections (2-4).

The diagnosis of IGM is made by identifying non-caseating granulomatous inflammation histologically after excluding other causes of granulomatous mastitis. Although the exact etiology of IGM is unknown, factors such as granulomatous and autoimmune diseases, hyperprolactinemia, diabetes mellitus, alpha-1 antitrypsin deficiency, oral contraceptive use, immune response to local trauma, local irritants, and mycotic and parasitic infections are thought to contribute to the disease (5, 6). Although there is no established ethnic predisposition for IGM, cases are most frequently reported from Mediterranean countries like Turkey and Asian countries such as China, Malaysia, and Saudi Arabia (5,16,17). IGM is often seen in women in their 30s and 40s who have given birth (18). Lactation is considered one of the responsible factors, with 2 patients in our study being in the lactation period. Although the exact reason for the predominance of right breast involvement is not specified, it is reported more frequently in the literature (5). However, in our study, right breast involvement was observed in 38.46% of cases.

Erozgen et al. reported that the most common presenting complaint was a palpable mass, followed by pain (23). In our study, at initial presentation, 16 patients had a mass and purulent discharge, 7 had pain and swelling, and 16 had only a palpable mass. As the disease became chronic, abscess formation and fistulization were observed more frequently. It has been reported that up to 25% of cases can involve both breasts (1, 3, 5). In our series, all 39 patients had unilateral involvement.

There are no pathognomonic findings in imaging for IGM. Ultrasonography generally shows hypochoic, heterogeneous lesions with unclear borders, diffuse edematous and inflammatory changes, ductal ectasia areas, and skin fistulization. Mammograms may reveal areolar and periareolar skin thickening, irregularly contoured asymmetric glandular opacities, and microcalcification foci.

Therefore, it can be confused with malignant masses. There are no pathognomonic findings reported in the literature for breast MRI in granulomatous mastitis (6-9).

Fine-needle aspiration biopsy (FNAB) is not recommended for diagnosis; instead, tru-cut biopsy or excisional biopsies are recommended for definitive diagnosis (32). In our study, all patients were definitively diagnosed through histopathological examination of excisional biopsy specimens obtained after surgery.

There is no established treatment protocol for the curative management of IGM. To prevent unnecessary treatments, excluding malignancy and other causes of granulomatous mastitis and obtaining a definitive histopathological diagnosis is crucial. The treatment protocol includes medical approaches such as steroids, colchicine, methotrexate, and azathioprine, along with wide surgical excision (8-10). Oral prednisolone at a dose of 0.8 mg/kg/day is preferred for corticosteroid therapy, with a treatment duration of 6 months. However, a recurrence rate of up to 50% has been reported after discontinuing steroid treatment (7). Aksoy et al. showed that in their study of 15 patients, those who underwent wide excision had no recurrence after 1 year of follow-up, whereas only 1 out of 4 patients treated with steroids achieved complete resolution of the disease (25). Asoğlu et al. suggested that mastectomy could be applied in chronic and recurrent cases (33). In our study, surgical resection and intraoperative local steroid application were performed in 37 cases of IGM. Recurrence was observed in 2 cases from the drain sites within one year, and surgical re-excision was performed, with no second recurrence observed.

Breast tuberculosis mastitis can be a primary focus or develop secondary to a lesion elsewhere in the body. It is generally believed that breast tuberculosis develops secondary to another focus in the body (14, 20, 34). Erosions on the breast skin and openings of the milk ducts in the nipple can be a source of primary tuberculosis infection. Eroğlu et al. reported that breast tuberculosis could develop through direct spread from the ribs (35). In our study, tuberculosis mastitis was

detected in 2 out of 39 cases, with no other focus found in either case. While breast tuberculosis is generally observed in women, cases of male tuberculosis mastitis have also been reported (36). Clinically, breast tuberculosis presents with a palpable hard breast mass, axillary lymphadenopathy, and breast pain, but systemic symptoms such as fever, weight loss, and night sweats are rarely observed (12-14). Tuberculosis mastitis can also be confused with malignant masses. Pain and palpable tenderness are more common in tuberculosis masses than in malignant breast masses. Involvement of the nipple and areola complex is more common in breast tuberculosis than in malignant masses (12-14, 37). Therefore, histopathological examination during surgery is crucial to exclude

malignancy and confirm the diagnosis of breast tuberculosis.

5. Conclusion

Oral corticosteroids alone, empirical antibiotic therapy, and drainage of breast lesions are not sufficient for the definitive treatment of IGM. In our study, it was observed that the recurrence rate decreased after complete excision of the lesion and intraoperative steroid application. Therefore, local steroid application can also be used as a treatment method. In patients with tuberculosis mastitis, abscess drainage and antituberculous treatment may be sufficient in some cases, but wide surgical excision should be preferred in the presence of recurrent disease.

REFERENCES

1. Kessler E, Wolloch Y. Granulomatous mastitis: a lesion clinically simulating carcinoma. *Am J Clin Pathol.* 1972;58:642–6.
2. Diesing D, Axt-Flidner R, Hornung D, Weiss JM, Diedrich K, Friedrich M. Granulomatous mastitis. *Arch Gynecol Obstet.* 2004;269:233–6.
3. Tse GM, Poon CS, Ramachandram K, et al. Granulomatous mastitis: A clinicopathological review of 26 cases. *Pathology.* 2004;36:254–7.
4. Panzacchi R, Gallo C, Fois F, et al. Primary sarcoidosis of the breast: case description and review of the literature. *Pathologica.* 2010;102:104–7.
5. Bani-Hani KE, Yaghan RJ, Matalka II, Shatnawi NJ. Idiopathic granulomatous mastitis: Time to avoid unnecessary mastectomies. *Breast J.* 2004;10:318–22.
6. Heer R, Shrimankar J, Griffith CDM. Granulomatous mastitis can mimic breast cancer on clinical, radiological or cytological examination: a cautionary tale. *Breast.* 2003;12:283–6.
7. Çakır B, Tunçbilek N, Karakaş HM, Ünlü E, Özyılmaz F. Granulomatous mastitis mimicing breast carcinoma. *Breast J.* 2002;8:251–2.
8. Imoto S, Kitaya T, Kodama T, et al. Idiopathic granulomatous mastitis: case report and review of the literature. *Jpn J Clin Oncol* 1997; 27: 274-247. doi.org/10.1093/jjco/27.4.274
9. Hur SM, Cho DH, Lee SK, et al. Experience of treatment of patients with granulomatous lobular mastitis. *J Korean Surg Soc.* 2013;85:1–6.
10. Pistolese CA, Di Trapano R, Girardi V, Costanzo E, Di Poce I, Simonetti G. An unusual case of bilateral granulomatous mastitis. *Case Rep Radiol.* 2013;2013 694697.
11. Kim J, Tymms KE, Buckingham JM. Methotrexate in the management of granulomatous mastitis. *ANZ J Surg.* 2003;73:247–9.
12. Pandhi D, Verna P, Sharma S, Dhawan AK. Borderline-lepromatous leprosy manifesting as granulomatous mastitis. *Lepr Rev.* 2012;83:202–4.
13. Ditmyer H, Craig L. Mycotic mastitis in three dogs due to *Blastomyces dermatitidis*. *J Am Anim Hosp Assoc.* 2011;47:356–8.
14. Akçay MN, Sağlam L, Polat P, Erdoğan F, Albayrak Y, Povoski SP. Mammary tuberculosis-importance of recognition and differentiation from that of a breast malignancy: report of three cases and review of the literature. *World J Surg Oncol.* 2007;5:67.
15. Al-Khaffaf B, Knox F, Bundred NJ. Idiopathic granulomatous mastitis: A 25 year experience. *J Am Coll Surg.* 2008;206:267–73.
16. Ocal K, Dag A, Turkmenoglu O, et al. Granulomatous mastitis: clinical, pathological features, and management. *Breast J* 2010; 16: 176-182.
17. Han BK, Choe YH, Park JM. Granulomatous mastitis: mamographic and sonographic appearances. *Am J Radiol* 1999; 57: 1001-1006.
18. Baslaim MM, Khayat HA, Al-Amoudi SA. Idiopathic granulomatous mastitis: a heterogeneous disease with variable clinical

- presentation. *World J Surg.* 2007; 31: 1677-1681. doi.org/10.1007/s00268-007-9116-1
19. Erhan Y, Veral A, Kara E, et al. A clinicopathologic study of a rare entity mimicking breast carcinoma: idiopathic granulomatous mastitis. *Breast* 2000; 9: 52-56. doi.org/10.1054/brst.1999.0072
 20. Hee RNS, Kuk YN, Hyun EY, et al. Differential diagnosis in idiopathic granulomatous mastitis and tuberculous mastitis. *J Breast Cancer.* 2012;15:111-8.
 21. Peyvandi LB, Klpfel N, Grant E, Lyengar G. Granulomatous lobular mastitis: Imaging, diagnosis, and treatment. *AJR.* 2009;193:574-81.
 22. Kok KY, Telisinghe PU. Granulomatous mastitis: Presentation, treatment and outcome in 43 patients. *Surgeon.* 2010;8:197-201.
 23. Erözgen F, Ersoy YE, Akaydn M, et al. Corticosteroid treatment and timing of surgery in idiopathic granulomatous mastitis confusing with breast carcinoma. *Breast Cancer Research and Treatment.* 2010;123:447-52.
 24. Akyıldız EÜ, Aydoğan F, İlvan Ş, Calay Z. İdiopathic granulomatous mastitis. *J Breast Health.* 2010;6:5-8.
 25. Aksoy Ş, Aren A, Karagöz B, et al. Granüloamatöz mastit ve cerrahi tedavi. *İstanbul Tıp Dergisi.* 2010;11:164-7.
 26. Gürleyik G, Aktekin A, Aker F, Karagülle H, Sağlam A. Surgical treatment of idiopathic granulomatous lobular mastitis. *J Breast Cancer.* 2012;15:119-23.
 27. Bellavia M, Damiano G, Palumbo VD, et al. Granulomatous mastitis during chronic antidepressant therapy: Is it possible a conservative therapeutic approach? *J Breast Cancer.* 2012;15:371-2.
 28. Lin CH, Hsu CW, Tsou T, Chou J. Idiopathic granulomatous mastitis associated with risperidone-induced hyperprolactinemia. *Diagn Pathol.* 2012;7:2.
 29. Csemi G, Szajiki K. Granulomatous lobular mastitis following drug-induced galactorrhea and blunt trauma. *Breast J.* 1999;5:398-400.
 30. Garcia-Rodriguez JA, Pattullo A. Idiopathic granulomatous mastitis: a mimicking disease in a pregnant woman: a case report. *BMC Research Notes.* 2013;6:95.
 31. Tuli R, O'hara BJ, Hines J, Rosenberg AL. Idiopathic granulomatous mastitis masquerading as carcinoma of the breast: a case report and review of the literature. *Int Semin Surg Oncol.* 2007;4:21.
 32. Al-Jarrah A, Taranikanti V, Lakhtakia R, Al-Jahri A, Sawhney S. Idiopathic granulomatous mastitis. Diagnostic strategy and therapeutic implications in Omani patients. *Sultan Qaboos Univ Med J.* 2013;13:241-7.
 33. Asoğlu O, Özmen V, Karanlık H, et al. Feasibility of surgical management in patients with granulomatous mastitis. *Breast J.* 2005;11:108-14.
 34. Cuervo SI, Bonilla DA, Murcia MI, et al. Tuberculosis of the breast. *Biomedica.* 2013;33:36-41.
 35. Eroğlu A, Kürkçüoğlu C, Karaoğlanoğlu N, Kaynar H. Breast mass caused by rib tuberculosis abscess. *Eur J Cardiothorac Surg.* 2002;22:324-6.
 36. Rajagopala S, Agarwal R. Tuberculous mastitis in men: case report and systematic review. *Am J Med.* 2008;121:539-44.
 37. Khanna R, Prasanna GV, Gupta P, Kumar M, Khanna S, Khanna AK. Mammary tuberculosis: report on 52 cases. *Postgraduate Med J.* 2002;78:422-4.

Ethics

Ethics Committee Approval: The study was approved by Eskisehir Osmangazi University Noninterventional Clinical Research Ethical Committee (Decision no: 36, Date: 16.01.2024). (2023/245)

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