

Unmasking the Unusual: Cystic Neutrophilic Granulomatous Mastitis (CNGM) in a Young Woman

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Abstract

Cystic neutrophilic granulomatous mastitis (CNGM) is a distinctive histopathologic subtype of granulomatous mastitis characterized by lobulocentric granulomas with cystic lipid spaces rimmed by neutrophils. There is a strong association with *Corynebacterium kroppenstedtii*, a fastidious, lipophilic Gram-positive bacillus with tropism for breast tissue. Here we report a case of granulomatous mastitis occurring during pregnancy, emphasizing the diagnostic importance of recognizing the characteristic histologic pattern of CNGM. This case highlights the critical role of the breast pathologist in establishing a specific diagnosis when pregnancy-associated breast changes complicate clinical and radiographic interpretation and therapeutic options are necessarily constrained.

Keywords

CNGM (Cystic Neutrophilic Granulomatous Mastitis), Histology, *Corynebacterium Kroppenstedtii*, Pregnancy

1. Introduction

Granulomatous mastitis encompasses a group of poorly characterized inflammatory breast disorders that commonly present with a breast mass or pain. Prior studies have shown that the cystic neutrophilic granulomatous mastitis (CNGM) subtype of so-called “idiopathic” granulomatous mastitis is associated with Gram-positive bacteria, particularly *Corynebacterium* species [1]. Histologically, CNGM is characterized by non-necrotizing, lobule-centered granulomatous inflamma-

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tion accompanied by a heterogeneous inflammatory infiltrate. In certain cases, the granulomas exhibit cystic lipid spaces lined by neutrophils, a distinctive feature commonly associated with cystic neutrophilic granulomatous mastitis [2]. Studies have shown that CNGM predominantly affects women between 25 and 49 years of age, with a median age of 34 years [2]. Treatment of CNGM remains challenging and generally consists of a combination of surgery, antimicrobial agents, and corticosteroids. Disease recurrence and prolonged clinical courses frequently result in the need for repeated interventions. Nevertheless, there is currently no standardized or widely accepted therapeutic regimen for these patients [2]. We present the case of a 28-year-old pregnant woman who presented with a short history of progressively worsening left breast pain and swelling.

2. Case Presentation

A 28-year-old pregnant Hispanic woman presented at 25 weeks of gestation with an 8-day history of worsening pain, swelling, and inflammation of the left breast. Physical examination revealed a firm, irregular, mildly tender mass with limited mobility. Initial treatment with dicloxacillin failed to produce clinical improvement. Given the characteristics of the mass, malignancy was also considered in the differential diagnosis. Consequently, the patient was followed weekly by the oncology service for close monitoring. The patient's clinical history was notable for pregnancy, a relevant factor because CNGM predominantly affects women of reproductive age and has been reported in association with pregnancy and lactation. Histopathologic findings supported a diagnosis of CNGM (Figure 1) and prompted empiric treatment with azithromycin 500 mg daily for 6 weeks, cephalexin 500 mg every 8 hours for 4 weeks, prednisone 30 mg twice daily, and topical hydrocortisone 1% cream applied twice daily.

Following initiation of this treatment regimen, the patient experienced significant clinical improvement. The phlegmonous lesion decreased in size from greater than 7 cm to 3.3 cm after one month of therapy. However, in the weeks preceding delivery, the patient temporarily discontinued her prescribed medications, resulting in recurrence of her symptoms.

Management of CNGM associated with *Corynebacterium kroppenstedtii* typically involves prolonged antibiotic therapy directed against lipophilic *Corynebacterium* species, including macrolides, tetracyclines, or clindamycin, and often requires a multidisciplinary approach to care.

2.1. Breast Imaging Findings

Breast imaging during pregnancy can be challenging because physiologic gestational changes, including increased breast density, vascularity, and glandular tissue volume, may reduce lesion conspicuity and mimic both benign inflammatory processes and malignancy [3] [4].

Ultrasound demonstrated diffuse hypoechoic inflammatory changes with hyperemia and no discrete abscess collection. Additional evaluation of the left axilla

revealed four abnormal level I lymph nodes. Ultrasound-guided core needle biopsies of the breast lesion and axillary lymph nodes were performed. The breast lesion corresponded to a diffuse area of hypoechogenicity involving the central left breast. Five core biopsy specimens were obtained from the breast lesion and five from the axillary lymph nodes for histopathologic evaluation. The sampled axillary lymph nodes demonstrated reactive changes.

Mammography and/or MRI, performed in this patient for marker localization, may be considered when clinically indicated, recognizing the limitations associated with pregnancy and lactation [3] [4].

2.2. Pathology Findings

Core needle biopsy demonstrated lobulocentric, non-necrotizing granulomas admixed with neutrophils and chronic inflammatory cells surrounding small cystic spaces (**Figure 1**). Scattered epithelioid histiocytes and multinucleated giant cells were present. Gram stain revealed sparse Gram-positive bacilli within the cystic spaces. These findings are diagnostic of cystic neutrophilic granulomatous mastitis, as previously described [5].

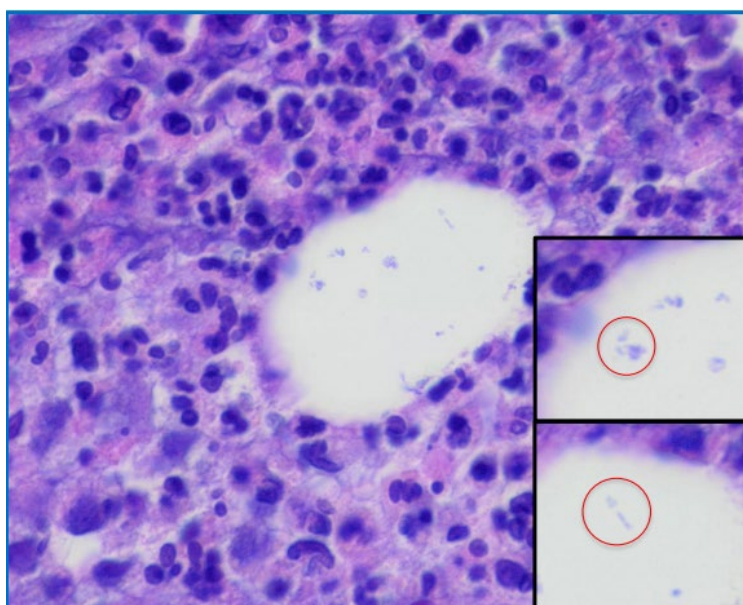


Figure 1. Left breast mass biopsy. H&E-stained section of the left breast mass showing a high power view of a lipid vacuole (cystic space) rimmed by neutrophils and containing clusters of rod-shaped bacilli (red circles).

The bacillary morphology was reviewed by a microbiologist, who concurred with the interpretation. Microbiologic cultures were not performed.

3. Discussion

Cystic neutrophilic granulomatous mastitis (CNGM) is a distinct and reproducible histopathologic entity rather than an idiopathic inflammatory process. During

pregnancy, physiologic breast changes, including increased glandular tissue, vascularity, and background parenchymal enhancement, can complicate clinical and radiologic assessment, resulting in overlapping with benign inflammatory conditions and pregnancy-associated breast cancer. Multiple studies have demonstrated that *Corynebacterium kroppenstedtii* is a true pathogen in this setting rather than a skin commensal [6].

Diagnosis can be challenging because *C. kroppenstedtii* is slow-growing and lipophilic, often resulting in negative routine cultures when standard microbiologic methods are used [7] [8]. The use of lipid-enriched culture media has been shown to improve diagnostic yield [8]. Although microbiologic cultures were not obtained in the present case, recognition of the characteristic CNGM histopathologic pattern, together with identification of Gram-positive bacilli, supported the diagnosis. Recognition of this pattern is therefore essential, as it can prompt appropriate microbiologic evaluation and facilitate timely, targeted therapy.

4. Conclusion

CNGM is a characteristic histopathologic pattern with direct therapeutic implications. Its recognition should prompt consideration of *Corynebacterium kroppenstedtii* and guide appropriate antimicrobial therapy.

Author Contributions

Dr. Twisha Oza: Case diagnosis, conceptualization, supervision, manuscript drafting, and critical revision. Dr. Upadhyay: Data collection, clinical history and findings, and preparation of the initial draft. Dr. Moultrie: Data collection. Dr. Hendrix: Clinical care and assistance with clinical findings. All authors reviewed and approved the final manuscript.

Declaration

Shared with consent for the purpose of advancing education and teaching; though not applicable to de-identified single case reports.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Troxell, M.L., Gordon, N.T., Doggett, J.S., Ballard, M., Vetto, J.T., Pommier, R.F., et al. (2016) Cystic Neutrophilic Granulomatous Mastitis: Association with Gram-Positive Bacilli and *Corynebacterium* Species. *American Journal of Clinical Pathology*, **145**, 635-645. <https://doi.org/10.1093/ajcp/aqw046>
- [2] D'Alfonso, T.M., Moo, T., Arleo, E.K., Cheng, E., Antonio, L.B. and Hoda, S.A. (2015) Cystic Neutrophilic Granulomatous Mastitis: Further Characterization of a Distinctive Histopathologic Entity. *American Journal of Surgical Pathology*, **39**, 1440-1447. <https://doi.org/10.1097/pas.0000000000000479>
- [3] Vashi, R., Hooley, R., Butler, R., Geisel, J. and Philpotts, L. (2013) Breast Imaging of

the Pregnant and Lactating Patient: Imaging Modalities and Pregnancy-Associated Breast Cancer. *American Journal of Roentgenology*, **200**, 321-328.

<https://doi.org/10.2214/ajr.12.9814>

- [4] Nissan, N., Bauer, E., Moss Massasa, E.E. and Sklair-Levy, M. (2022) Breast MRI during Pregnancy and Lactation: Clinical Challenges and Technical Advances. *Insights into Imaging*, **13**, Article No. 71. <https://doi.org/10.1186/s13244-022-01214-7>
- [5] Renshaw, A.A., Derhagopian, R.P. and Gould, E.W. (2011) Cystic Neutrophilic Granulomatous Mastitis: An Underappreciated Pattern Strongly Associated with Gram-Positive Bacilli. *American Journal of Clinical Pathology*, **136**, 424-427. <https://doi.org/10.1309/ajcp1w9jbryoqsnsz>
- [6] Taylor, G., Paviour, S., Musaad, S., Jones, W. and Holland, D. (2003) A Clinicopathological Review of 34 Cases of Inflammatory Breast Disease Showing an Association between Corynebacteria Infection and Granulomatous Mastitis. *Pathology*, **35**, 109-119. <https://doi.org/10.1080/00313020307574>
- [7] Wu, J.M. and Turashvili, G. (2020) Cystic Neutrophilic Granulomatous Mastitis: An Update. *Journal of Clinical Pathology*, **73**, 445-453. <https://doi.org/10.1136/jclinpath-2019-206180>
- [8] Wong, S.C.Y., Poon, R.W.S., Foo, C., Ngan, A.H.Y., Tse, H., Lam, V.C.M., et al. (2018) Novel Selective Medium for the Isolation of *Corynebacterium kroppenstedtii* from Heavily Colonised Clinical Specimens. *Journal of Clinical Pathology*, **71**, 781-786. <https://doi.org/10.1136/jclinpath-2017-204834>