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Case Report

Mammographically and sonographically occult male DCIS seen only on breast MRI [☆]

Kendrah Osei, MD, Babita Panigrahi, MD*

Russell H. Morgan Department of Radiology and Radiological Science, Johns Hopkins Medicine, 601 N. Caroline St., Baltimore, MD

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ABSTRACT

Male breast cancer is a rare entity consisting of less than 1% of all breast cancer diagnoses, in which pure ductal carcinoma in situ (DCIS) without an invasive component accounts for approximately 10% of these diagnoses. Early diagnosis and appropriate management are essential to ensure favorable outcomes. We present a rare case of mammographically and sonographically occult pure DCIS in a male patient presenting with unilateral bloody nipple discharge, highlighting imaging features and the potential utility of breast MRI that aided diagnosis and management.

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Introduction

Male breast cancer is a rare but serious diagnosis, accounting for less than 1% of cancer diagnoses in men and less than 1% of all breast cancer diagnoses [1,2]. The American Cancer Society estimates there will be 2,790 new cases of male breast cancer and 530 deaths due to male breast cancer in 2024 [3]. Risk factors include advanced age, Black race, family history, genetic mutations especially including BRCA2, radiation exposure, and causes of hormone imbalances (i.e., obesity, exogenous hormones, liver disease, Klinefelter syndrome) [4]. The majority of male breast cancers are invasive ductal carcinomas. Pure ductal carcinoma in situ (DCIS) without an invasive component represents approximately 10% of all male

breast cancers, and may be difficult to diagnose without palpable findings at presentation in men who do not undergo routine breast cancer screening [5-7].

Compared to breast cancer in women, male breast cancers are typically larger, have a greater likelihood of nodal involvement, and have poorer prognoses due to later stage at presentation [8-10]. DCIS is thought to be a precursor to invasive carcinoma, therefore early diagnosis and appropriate management are imperative to improve the outcomes of male breast cancer. In the absence of mammographic or sonographic imaging findings, the diagnosis of DCIS can be particularly difficult.

There are few cases that describe the clinical and imaging features of pure DCIS in the male breast [11,12], fewer of which demonstrate the findings of this entity on breast MRI

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* Corresponding author.

E-mail address: spanigr1@jhmi.edu (B. Panigrahi).<https://doi.org/10.1016/j.radcr.2024.05.006>1930-0433/© 2024 The Authors. Published by Elsevier Inc. on behalf of University of Washington. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

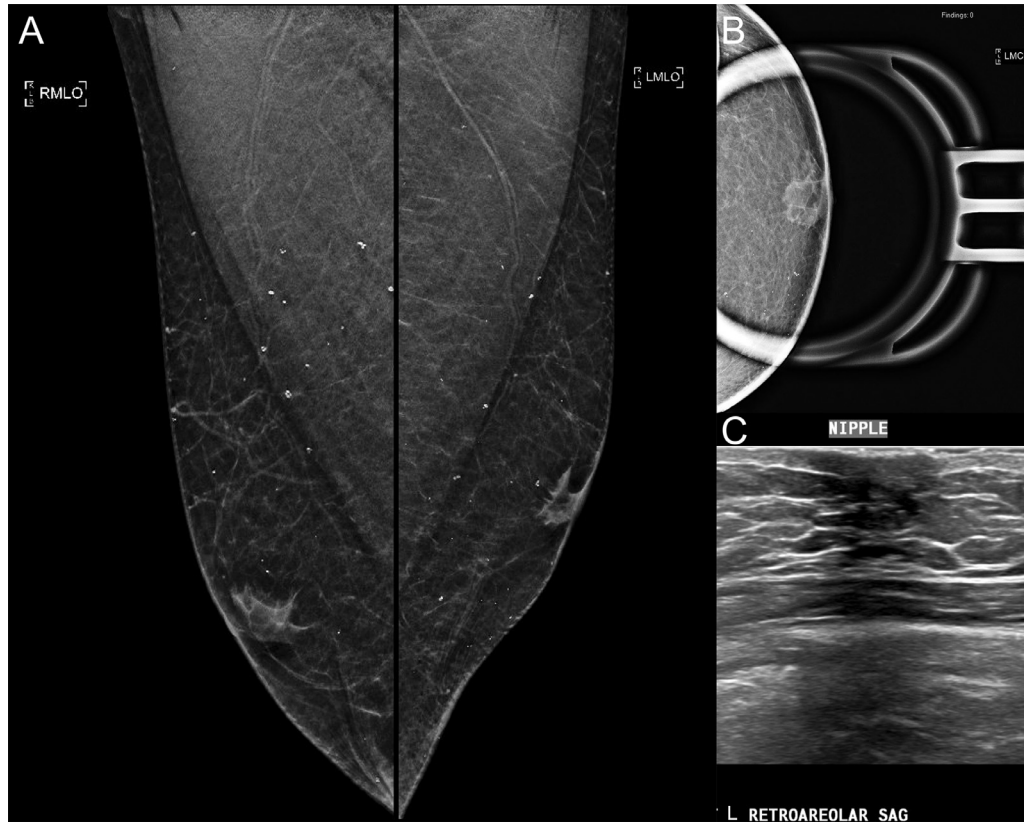


Fig. 1 – Benign initial mammogram and ultrasound workup for bloody left nipple discharge. Bilateral mammogram demonstrated mild bilateral symmetric gynecomastia without suspicious findings (A). Mammographic magnification view of the left retroareolar breast demonstrated scattered benign-appearing calcifications without discrete suspicious group (B). Targeted left retroareolar breast ultrasound demonstrated normal retroareolar glandular tissue consistent with gynecomastia without suspicious sonographic finding (C).

[13,14]. Here we present a rare case of mammographically and sonographically occult pure DCIS in a symptomatic male patient seen only on breast MRI.

Case presentation

A 70-year-old man presented to clinic with a 2-month history of spontaneous unilateral bloody left nipple discharge. Other than a postmenopausal sister with a history of breast cancer, the patient had no additional risk factors. Bilateral diagnostic mammogram with digital breast tomosynthesis, including left retroareolar breast magnification views, and a targeted left retroareolar breast ultrasound were initially performed. Both demonstrated mild gynecomastia without suspicious findings, given a BI-RADS 2 benign assessment (Fig. 1).

Despite a benign mammographic and sonographic workup, the patient underwent surgical consultation and was referred for dynamic contrast-enhanced bilateral breast MRI due to symptomatology. Breast MRI demonstrated 16 mm linear non-mass enhancement in a segmental distribution in the left retroareolar breast at anterior depth extending to the base of the left nipple, given a BI-RADS 4 suspicious assessment

(Fig. 2). Because this finding was not amenable to MRI biopsy due to small male breast size and proximity to the nipple, the patient was recommended to proceed directly to surgical excision.

Surgical subareolar duct excision of the retroareolar tissue was performed. Final pathology demonstrated a 6.0 mm span of estrogen receptor positive, grade 1-2 DCIS with a focally positive anterior margin. A left mastectomy including excision of the nipple areolar complex was performed in a subsequent surgery 1 month later, demonstrating a 3.5 mm span of residual DCIS with negative margins.

Discussion

Pure male DCIS is a rare diagnosis, accounting for approximately 10% of male breast cancer diagnoses and < 0.1% of all breast cancer diagnoses [5-7]. There is scarce literature on the diagnosis, management, and treatment of the disease. This unique case demonstrated pure DCIS in a male patient with bloody nipple discharge, benign initial mammogram/ultrasound workup, and suspicious MRI findings. Management in this case highlights a potential use of breast MRI in men, and reinforces the practice of continued investigation in

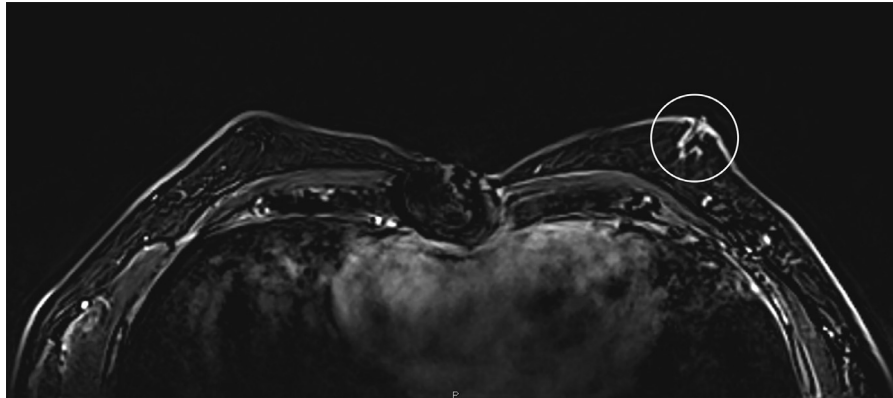


Fig. 2 – Male DCIS on MRI. Dynamic contrast-enhanced MRI first postcontrast subtraction image demonstrated left retroareolar breast linear non-mass enhancement in a segmental distribution extending to the left nipple, corresponding to the patient’s reported bloody left nipple discharge. Subsequent surgical excision demonstrated DCIS.

the setting of suspicious symptomatology even after negative initial imaging.

The American College of Radiology (ACR) outlines appropriateness criteria for the diagnostic workup of the symptomatic male breast [15]. While these criteria recommend an age threshold of 25 years for utilizing mammography in addition to ultrasound as the initial imaging of choice for men presenting with an indeterminate palpable mass, there is no age cutoff to initially use both mammography and ultrasound in male patients with clinical findings suspicious for breast cancer. These findings include a suspicious palpable mass, axillary adenopathy, nipple discharge, and/or nipple retraction. The ACR specifically notes that breast MRI is “usually not appropriate” in any symptomatic male, including those with nipple discharge. In our case, the patient underwent both mammography and ultrasound on initial workup that demonstrated benign findings, then subsequently underwent an MRI that demonstrated malignancy.

There are no specific indications for breast MRI as the initial imaging modality of investigation for the symptomatic male breast, or for surveillance of male patients at high risk for breast cancer [15,16]. A case series presented by Shin et al. found that breast MRI may be useful to evaluate extent of disease in certain cases of known male breast cancer [17]. These scenarios include assessment of chest wall involvement for posterior lesions, evaluation of skin involvement for suspected inflammatory breast cancer, extent of axillary metastases, and assessment of residual disease following surgery or neoadjuvant therapy. In our case, breast MRI demonstrated abnormal enhancement extending to the nipple. Although a breast cancer diagnosis was not confirmed until after initial surgery, the preoperative breast MRI may have predicted positive anterior margins given that the nipple was involved.

Pathologic nipple discharge has a high positive predictive value of up to 57% predicting carcinoma in men [18]. As in our case, breast MRI may be useful in the setting of suspicious male nipple discharge and a negative mammographic/sonographic workup. Two case reports utilizing MRI

after initial negative mammographic/sonographic workup for bloody nipple discharge ultimately demonstrated DCIS on biopsy [13,14]. In both of these cases, the MRI helped identify biopsy targets on repeat MRI-directed ultrasound and mammography. In contrast, our case uniquely demonstrated a suspicious MRI finding of linear non-mass enhancement that was truly mammographically and sonographically occult, therefore the next reasonable step in management was surgical excision.

Current treatment options for male breast cancer are based on extent of disease. The National Comprehensive Cancer Network, American Society of Clinical Oncology, and the National Cancer Institute have outlined management strategies, including surgery with/without radiation and adjuvant therapy for localized cancer, neoadjuvant therapy, surgery, radiation, and adjuvant therapy for locally advanced cancer, and aromatase inhibitor therapy in conjunction with gonadotropin-releasing hormone agonist therapy for metastatic cancer [16,19,20]. All male patients diagnosed with breast cancer should be offered genetic counseling. Although data to support male breast cancer screening is limited, recent studies suggest that there may be a role for annual screening mammography in high-risk men with a genetic mutation and/or personal history of breast cancer [21-23].

Conclusion

Male breast cancer is a rare, even more so when considering the diagnosis of pure DCIS. With an increasing incidence in the aging male population, prompt diagnosis and management are imperative for early diagnosis to improve outcomes and prevent progression to invasive carcinoma. Clinician recognition of suspicious findings is necessary for patients to be routed to the appropriate diagnostic imaging. Surgical evaluation and possibly breast MRI may be considered in the setting of suspicious symptomatology after a negative mammographic and sonographic workup.

Patient consent

The authors certify that written, informed consent for publication of this case report was obtained from the patient.

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