



High-grade Ductal Carcinoma *In Situ* (DCIS) of the Male Breast Treated with Breast Conserving Therapy

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Abstract

Ductal carcinoma *in situ* (DCIS) is a rare diagnosis in a man, and rarer still is the detection of a high grade *in situ* lesion. The surgical management of both invasive breast cancer and DCIS in men is typically mastectomy. We report the case of a 61 year-old man who presented with a right-sided breast mass. The abnormality was appreciated by his primary physician, and she also palpated a left-sided nodule. Subsequent bilateral diagnostic mammogram and ultrasound showed no abnormalities on the right, but did reveal a suspicious sub-centimeter lesion in the upper inner quadrant of the left breast. Biopsy showed high grade DCIS. He underwent lumpectomy followed by adjuvant radiotherapy (RT) to the whole left breast. He tolerated surgery and RT well and has no evidence of disease and good cosmesis at 20 months follow-up. Much is known about both invasive and *in situ* breast disease in women, including risk factors, distribution of sub-types, and treatment options. The same cannot be said for male DCIS. In this case, we discuss the differences in male and female DCIS, as well as disparities in surgical management.

Keywords: Male breast cancer; Male DCIS; Ductal carcinoma *in situ*; Breast conserving therapy

Introduction

Male breast cancer (MBC) accounts for less than 1% of breast carcinomas in the US [1]. Among MBCs, pure DCIS is rare, comprising approximately 5% of cases [2,3], and high-grade DCIS is seldom detected. An extensive literature search revealed only two such reported cases [4,5]. The histopathology and risk factors of MBC differ in part from those of women [6]. Many female breast cancers, particularly those that are early stage, are treated with breast conserving therapy (BCT), which includes lumpectomy, +/- adjuvant chemotherapy, and RT; and the majority of women with DCIS undergo lumpectomy. The standard surgical approach for men with *in situ* and invasive disease, however, is mastectomy, with very few undergoing BCT.

Case Presentation

A 61 year-old African-American man with a past medical history of prostate cancer treated with radical prostatectomy alone in 2006, hypertension, and morbid obesity (BMI: 46 kg/m²) and a family history of breast cancer in his sister, presented to his primary physician with a palpable right breast nodule. She conducted a bilateral breast exam and in addition to palpating the initial area of concern, she palpated an approximate 1cm lesion in his left breast.

The right breast appeared normal on diagnostic mammogram and ultrasound with no abnormality detected corresponding to the self-palpated area. Imaging with subsequent spot compressions of the contralateral (left) breast, however, revealed a 9mm lesion in the upper inner quadrant. A core needle biopsy of the left-sided lesion revealed DCIS. (Figure 1) shows the diagnostic mammography and ultrasound images of the left breast and lesion.

The case was presented at multi-disciplinary tumor board. At initial consultation, the surgeon appreciated the palpable mass in the 10-11 o'clock position of the left breast, noted to be approximately 2 cm from the nipple areolar complex (NAC). She noted the patient's bilateral gynecomastia (described as "C-cup sized" breasts) and remarked that he had adequate tissue to undergo a lumpectomy, thus obviating the more involved surgical mastectomy. Final pathology from lumpectomy revealed high-grade DCIS that was 0.5 cm in largest dimension, cribriform subtype with focal necrosis, estrogen receptor (ER) and progesterone receptor (PR) positive, and

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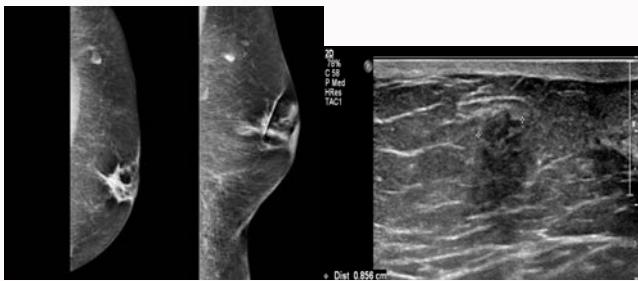


Figure 1: Diagnostic mammographic views of the patient's left breast: far left: CC view, center: MLO view, right: ultrasound.



Figure 2: The patient on his last day of his radiotherapy treatment. Note mild hyperpigmentation of his left breast.

negative surgical margins. The specimen weighed 7.0 g and measured 3 cm x 2.7 cm x 1.2 cm. As is customary in cases of DCIS without suspicion of micro-invasion, no sentinel lymph nodes were sampled.

Approximately 4 weeks following surgery, we saw the patient for initial radiation oncology consultation. He was healing well with an approximate 3 cm surgical incision about 1.5 cm superior to the nipple with some associated nipple retraction likely due to the proximity of the incision to the NAC. We appreciated bilateral gynecomastia, and questioned the patient regarding this finding. He reported that he had this condition for 10 to 15 years, during a time when he gained considerable weight. He added that he had significant gynecomastia when he was young and undergoing puberty. Blood levels of testosterone and estrogen were checked prior to commencing RT, with the former being below normal (not surprising as he underwent prostatectomy) and the latter within normal range. A comprehensive chemistry panel and thyroid and liver function tests were checked to rule out other causes of gynecomastia, and were within normal limits. Shortly after our meeting he underwent adjuvant RT to 42.4Gy to the whole left breast in 16 fractions (hypofractionated regimen). The patient tolerated RT well, experiencing mild skin hyperpigmentation, well within normal range (see Figure 2: patient's chest on his last day of treatment). Of note, medical oncology was consulted regarding placing this patient on hormonal therapy given his positive hormone receptor status, but it was felt there was not enough evidence to support its use in a man with DCIS. Now in follow-up, he is monitored with clinical breast exams and annual bilateral mammograms.

Discussion

The most commonly reported male DCIS patterns are papillary and cribriform, whereas women's histological patterns are more evenly distributed among the five subtypes. One of the larger published

series addressing male DCIS is from Hittmair in which 84 men with pure DCIS were retrospectively reviewed. Nearly 90% of cases were papillary, cribriform, or a mix of the two [7]. A smaller series reports 31 pure DCIS cases retrospectively reviewed from a group of French regional cancer centers. Papillary and cribriform patterns accounted for the majority of cases [8]. An important prognostic factor in DCIS is grade, with high grade lesions conferring an increased risk of *in situ* and invasive recurrence. Approximately 45-50% of female DCIS is high grade, but is an exceptionally rare finding in men [9]. Hittmair reported no grade 3 lesions among his patients and noted that "high grade pure DCIS [is] a rare lesion in the male breast," particularly when compared with invasive ductal carcinoma (IDC) cases in men [7].

Review of the literature yielded two case reports detailing high-grade male DCIS [4,5], both of which were surgically managed with mastectomy.

Although roughly 15% of MBC patients have a genetic mutation (most commonly BRCA2), the etiology for many cancers remains unknown. Some reports do not cite patient race [10], although the vast majority present Caucasian patients. Unlike the slightly higher incidence rates among white (versus black) women, African American men have a higher incidence of MBC, with age-adjusted rates of 1.65 per 100,000 in blacks and 1.31 in whites [1]. Factors known to increase risk in women also increase MBC risk, including obesity, prior chest radiation, and family history. Specific to men, however, are conditions that perturb the physiological estrogen-to-androgen balance. Klinefelter syndrome (inheritance of an additional X chromosome) confers the highest risk for MBC with a 20- to 50-fold increase compared to normal 46XY karyotype men [11]. Other conditions causing increased estrogen include obesity and liver disease, both cited as risk factors for MBC [1]. Gynecomastia is the pathophysiological enlargement of glandular male breast tissue, and is a common condition among pubertal boys and aging men [9]. Although gynecomastia is listed as a MBC risk factor in several sources [4,10,11], causality has not been established. A cohort study reported by Olsson and Bladstrom [10] followed 446 men with a clinical and histopathological diagnosis of gynecomastia who were matched to Swedish population registries and followed for over 20 years. There was no significantly increased risk of MBC among these men.

The surgical approach for MBC has historically been a simple or modified radical mastectomy. Lumpectomy, as part of BCT, is rarely performed in MBC patients. All single published case reports of male DCIS reviewed for this article – with one exception – involved surgical management with mastectomy. The Hittmair series focuses on morphological features and does not address surgical management [7]. Cutuli's account reported six of the 31 men with DCIS undergoing lumpectomy, with the rest undergoing mastectomy [8]. It should be noted that no men in the lumpectomy group received adjuvant RT. With a median of 83 months follow-up, local relapse is reported in four (13%), three of whom were in the lumpectomy alone group. Cutuli concludes that the "cosmetic aspect is of minor importance [in men], and therefore the optimal treatment for DCIS is simple mastectomy." Deutsch and Rosenstein describe the case of a 53 year-old obese man diagnosed with left-sided DCIS treated with lumpectomy and adjuvant RT [12,13]. The patient did not wish to undergo mastectomy because he feared poor cosmesis given the likely subsequent size discrepancy between his breasts. Following resection

he underwent adjuvant RT to the whole left breast. Deutsch and Rosenstein reported very favorable cosmesis at 3.5 years of follow-up with no evidence of recurrence.

Conclusion

The rarity of male DCIS has led to a paucity of data regarding its management and outcomes. Whereas major national trials provide clear guidance for the management of DCIS in women, no such studies exist for men. Although there are some differences between male and female breast disease, including DCIS, data suggests that men have similar responses to treatment and recurrence patterns. BCS and BCT should be routinely considered for eligible men, as it has for women, thus eliminating unnecessarily extensive surgeries.

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