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A "Spontaneously Shrinking" Breast Mass: Unusual Presentation of Invasive Tubular Carcinoma

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A solid breast mass that decreases in size over time without treatment is generally felt to be inconsistent with a diagnosis of malignancy. We describe a case where this dogma proves to be incorrect. Mammographic features of a mass, along with the patient's clinical hormonal status, need to be considered along with size characteristics.

Introduction

Screening mammography is recommended every one to two years in all women over age 40 and yearly for women over the age of 50 [1]. There are certain mammographic findings, including spiculated mass borders, pleomorphic calcifications and architectural distortion, which are suspicious for malignancy and lead patients to further imaging work-up and subsequent biopsy. We describe a case where biopsy of a suspicious mass was delayed because of an interval decrease in mass size, leading to the clinicians to assume that the mass represented a benign process.

Case Report

A 63-year-old post-menopausal female presented six months previously for a second opinion regarding a right breast mass. Review of prior outside mammograms demonstrated an ill-defined nodule in the upper outer quadrant of the right breast. This mass had been noted on the previous outside mammogram reports from different institutions. The reports that were available for review indicated that the mass was decreasing in size. The original mammogram noting the mass and any recommendations given at that point were not available for review.

Six years prior to presentation, the mass measured at 9 mm. It progressively decreased in size to 4 mm on the most recent mammogram (Figure 1). Given its apparent interval decrease in size, the radiologist felt that this was unlikely to represent a malignancy and recommended a 6 month follow-up mammogram.

At the 6 month follow-up, recommended by the second opinion at our institution, the mass remained unchanged in size but had slightly different shape characteristics. Additional spot compression views revealed the mass to have spiculated margins, a worrisome feature on mammography that is highly suggestive of malignancy (Figure 2). Regardless of the decrease in size of the mass over the six years preceding presentation for a second opinion, biopsy was recommended.

An ultrasound-guided biopsy (Figure 3) revealed invasive tubular carcinoma with ductal carcinoma in situ. The patient underwent lumpectomy and sentinel lymph node biopsy. The excised specimen confirmed a 0.4 cm infiltrating tubular carcinoma, Bloom-Richardson grade 1, with a coexisting small region of ductal carcinoma in situ. The tubular carcinoma was estrogen and progesterone receptor (ER/PR) positive. The two sentinel lymph nodes were negative for metastatic disease.

Of note, the patient had a natural menopause at age 53, and subsequently was placed on hormone replacement therapy (HRT). Secondary to concerns about cardiovascular risk and increased risk for breast malignancy, the patient terminated her HRT use approximately five years prior to presentation for the second opinion. This coincides with the interval decrease in size of the suspicious breast mass on mammography. The patient was unable to recall exact details of her prior HRT regimen. She restarted her HRT (Prempro 0.3/1.5 one per day) approximately six months prior to presentation for a second opinion.

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Abbreviations: ER/PR, estrogen and progesterone receptor, HRT, hormone replacement therapy, IRB, investigational review board, SERM, selective estrogen modifiers, STAR, study of tamoxifen and raloxifene, MLO, medial lateral oblique

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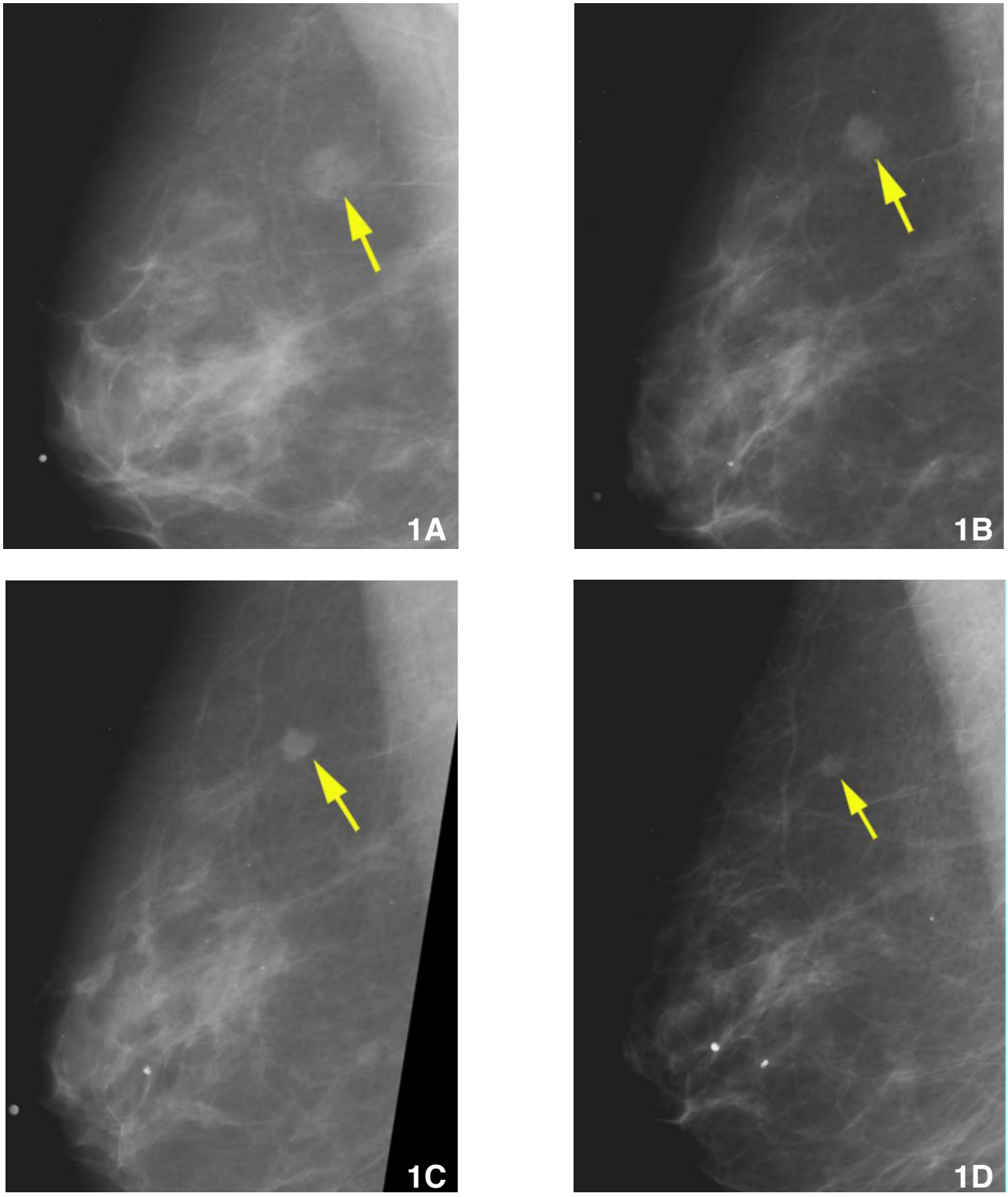


Figure 1. Mammograms of the right breast in the medial lateral oblique (MLO) projection demonstrating a mass (arrow) in the upper outer quadrant that is decreasing in size over six years. A, Six years prior. B, Four years prior. C, Two years prior. D, At presentation.

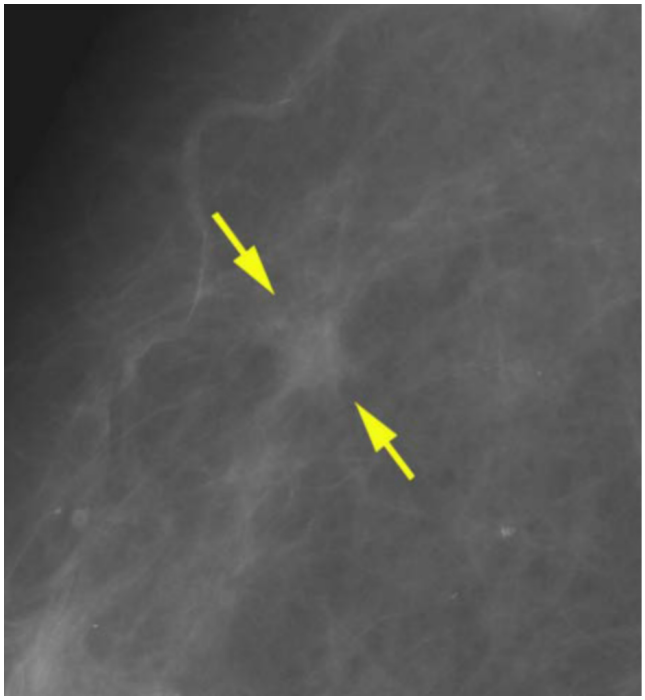
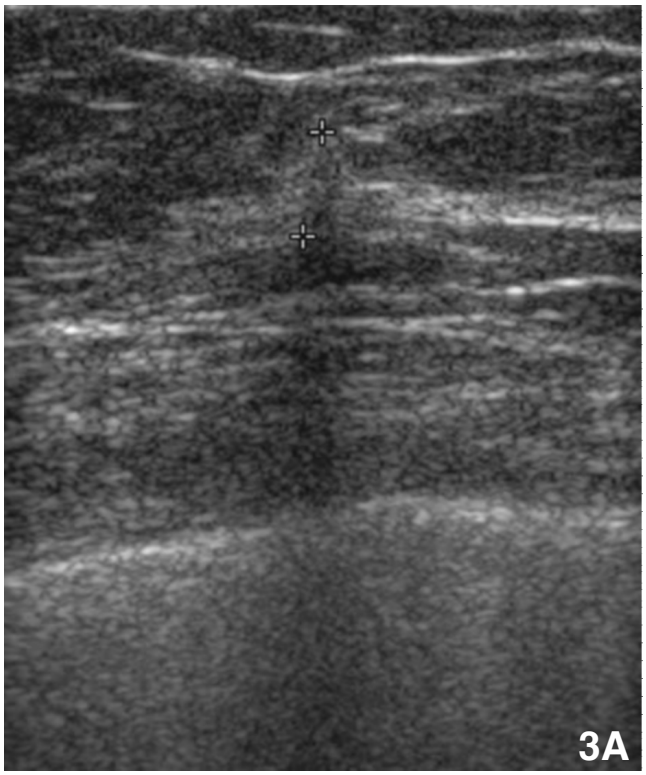


Figure 2. Spot compression CC view of the mass (arrows) demonstrating spiculated margins.



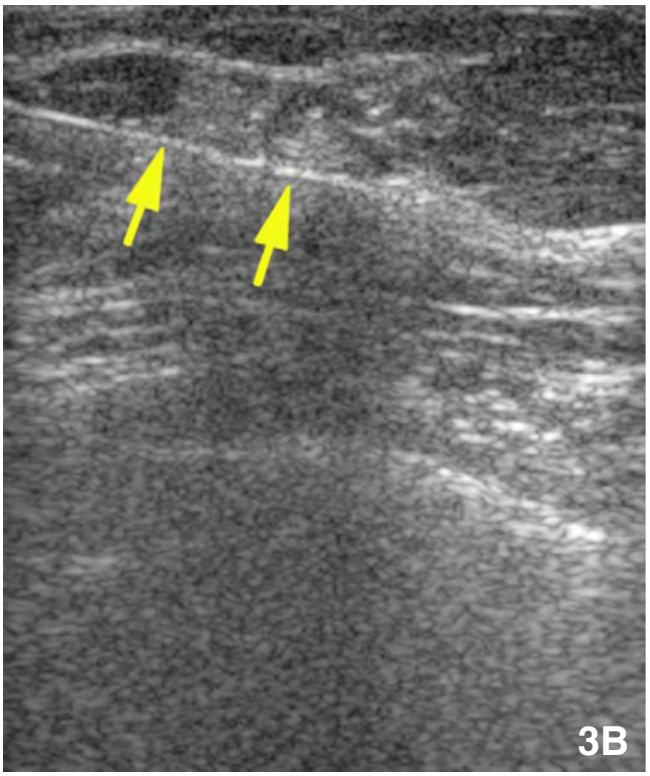


Figure 3. Ultrasound images of the right upper outer quadrant mass. A, Before biopsy, the mass (between cursors) is hypoechoic with irregular borders and is taller-than-wide. B, During biopsy the mass is partially obscured by the biopsy needle (arrows).

Our Investigational Review Board (IRB) does not require review and approval of single case reports.

Discussion

The effect of HRT in causing an overall increase in breast tissue density is well established [2]. Depending on the type of hormone replacement and how breast density is defined, there is a reported 17% to 73% incidence of increased breast tissue density [3]. Along the same lines, withdrawal of exogenous estrogen will cause the density of breast tissue to decrease [4]. The Women's Health Initiative demonstrated that the use of HRT in women has been linked to an increase risk of both cardiovascular events as well as breast cancer [5]. This data has led to many women to discontinue their HRT regimen [6-7].

Our case is unusual in that a biopsy proven malignancy decreased in size over the course of six years, which was misinterpreted mammographically as representing a benign process. In actuality, it is likely that the estrogen-sensitive malignancy was decreasing in size due to withdrawal of exogenous hormones and progressive decrease of endogenous hormones. This situation has been described before in a patient who terminated her hormone therapy after the diagnosis of breast cancer [8]. This is the second case report that we are aware of in which the decreasing size of an estrogen-sensitive solid breast mass presented a diagnostic dilemma [9]. An alternative possibility, as was proposed in the case report by Burnside et al, is that the breast carcinoma was spontaneously regressing.

Imaging

Certain mammographic characteristics are suspicious for malignancy. These include spiculated borders of a mass, pleomorphic calcifications and architectural distortion. If any of these features are present on a mammogram, they should be reported as suspicious. The interpreting physician should not be swayed by stability or even, in this case, interval decrease in size of the abnormality. This case had a typical, but not specific, appearance for tubular carcinoma, which is small, solid mass with spiculated borders.

Clinical history

When assessing the clinical presentation of a patient in context with mammographic findings, the patient's hormonal status is paramount. It is not sufficient to determine if the patient currently uses HRT. The patient's entire hormonal history, including dates of use and replacement regimens, should be documented and correlated with any changes on mammography.

Effect of tamoxifen

Although this patient was not taking tamoxifen, it is possible that other patents taking this drug could show regression of a breast carcinoma. Tamoxifen is used for the treatment of breast cancer and the prevention of breast cancer. This is not only true of tamoxifen but also with other selective estrogen modifiers (SERM) such as raloxifene. Recently reported Study of Tamoxifen and Raloxifene (STAR) trial demonstrated a 49% reduction in the risk of development of breast cancer using either hormonal agent [10]. This study confirmed the use of SERM for chemoprevention of breast cancer in high risk women. Women who are placed on SERM for chemoprevention of breast cancer should have a thorough radiographic evaluation of the breasts prior to the initiation of therapy. The use of SERM will need to be addressed if a suspicious lesion is seen to be changing. In our experience at the Mayo Clinic, we have not seen regression of lesions, but rather have observed progression of lesions while on SERM leading to biopsies and the diagnosis of cancer.

Tamoxifen has been used as neoadjuvant therapy for breast cancers resulting in an approximate 50% response rate in this setting [11]. Tamoxifen has facilitated the conversion of inoperable breast cancers to operable and the change in surgical management from mastectomy to breast conservation surgery in women with estrogen positive tumors. Unfortunately the response rate with neoadjuvant hormonal therapy is not as effective as chemotherapy and is generally limited to elderly women with significant comorbidities. Utilization of tamoxifen as primary therapy for breast cancer has been evaluated in two randomized trials comparing tamoxifen alone to surgery with adjuvant tamoxifen therapy [12-13]. Both these trials demonstrated a response rate of approximately 50%. Unfortunately most women treated with tamoxifen eventually needed surgery for local control.

Prognosis and treatment

Infiltrating tubular carcinoma is a well-differentiated type of breast cancer with a good prognosis when compared with invasive ductal carcinoma [14]. The natural history of tubular carcinoma is relatively indolent with a low incidence of systemic metastases [15-16]. Axillary spread of tumor occurs in approximately 13 to 20% of patients and is uncommon in lesions smaller than 1 centimeter [15,17]. Treatment options for infiltrating tubular carcinoma are the same as for any other invasive breast cancer, which includes treatment of the tumor with mastectomy or lumpectomy and staging of the axilla using axillary lymph node dissection or sentinel lymph node biopsy [18-19]. Post-operative adjuvant radiotherapy after lumpectomy has also been shown to decrease the risk of local recurrence not unlike other invasive breast cancers [20]. Our patient was treated using standard treatment guidelines.

Conclusion

Conventionally, an untreated breast malignancy usually does not decrease in size or resolve. A mass that decreases in size on mammography may lead to the conclusion that the lesion is not malignant. Our case demonstrates that this assumption is not always true. It is paramount that one evaluates the morphology of a lesion on mammography, regardless of stability or size, and correlate this with detailed knowledge of the hormonal status of the patient. The most suspicious characteristic of any lesion should guide the decision to perform a biopsy.

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