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Case report

Fluid-filled breast: A unique clinical presentation of invasive micropapillary carcinoma ☆

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ABSTRACT

Invasive micropapillary carcinoma is a rare variant of invasive ductal carcinoma of the breast. This variant has been described as clinically aggressive due to its high frequency of lymphovascular invasion, axillary nodal metastases, and a greater degree of loco-regional recurrence. Invasive micropapillary carcinoma can have a variety of imaging presentations, typically presenting as an irregular mass. This case report describes a unique presentation of invasive micropapillary carcinoma and illustrates the propensity of invasive micropapillary carcinoma to secrete fluid and have a lack of regional lymphadenopathy. The challenges of the accompanying diagnostic imaging-work up are discussed.

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Introduction

Invasive Micropapillary Carcinoma (IMPC) is a rare variant of invasive ductal carcinoma of the breast, accounting for 0.7%–4 % of breast cancers [1–5]. This variant has been described as clinically aggressive due to its high frequency of lymphovascular invasion, axillary nodal metastases, and a greater degree of loco-regional recurrence [5]. IMPC can have various imaging presentations typically presenting as a high-density irregular mass with spiculated margins often associated with calcifications [4]. We present an illustrative case of IMPC to highlight a unique clinical presentation and discuss the diagnostic imaging workup challenges.

Case report

A 71-year-old female presented to our hospital with a chief complaint that her left breast had become “red and swollen like a jelly.” The symptoms developed five months before presentation and gradually worsened with the development of open sores during the three weeks before the patient sought medical attention at our institution. Due to the weight of the enlarged breast, the patient was forced to carry the breast cradled in her arm described by one clinician as if she was “carrying a 6-month-old baby.”

Physical exam revealed a markedly enlarged left breast estimated as five times larger than the right breast (Fig. 1). The

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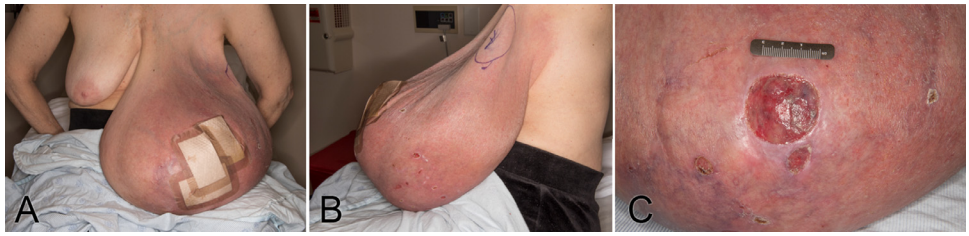

Fig 1 – 71-year-old woman presented for clinical evaluation of her left breast that had become "red and swollen like a jelly". Photographs taken with the patient's permission showed a markedly enlarged and erythematous left breast (A and B) with open sores (C) that produced serous exudate requiring her to keep the area bandaged.

left breast was soft with an underlying fluid wave. The skin along the lateral aspect of the left breast was erythematous when the patient was seated upright, but resolved when she lay supine. Additionally, there were prominent blood vessels along the upper outer quadrant with several open skin sores and dimpling along the lateral left breast. A nodular mass involving the entire upper outer quadrant of the left breast was palpable and estimated to grossly measure 6 × 6 cm. Along the inferomedial aspect of the palpable mass, a 2 × 2 cm open sore was observed, producing a serous exudate which the patient kept bandaged. The nipple areolar complex was deviated to the lower inner quadrant and markedly enlarged compared to the right nipple areolar complex.

The patient presented to the radiology department for diagnostic imaging. She had a bilateral diagnostic mammogram (Fig. 2) that showed a markedly enlarged left breast without a discrete mass. The patient's left breast ultrasound (US) (Fig. 3) showed an extensive fluid collection measuring 31 × 7 × 29 cm that laterally displaced the fibroglandular breast tissue. Evaluation of the left regional nodal basins identified a single left axillary level I lymph node with a prominent cortex that was targeted for fine-needle aspiration using a 21-gauge needle. The lymph node was negative for malignancy. Given the large fluid collection in the breast, the breast imaging radiologist recommended consulting interventional radiology (IR) for therapeutic and diagnostic drainage of fluid, after which the breast could be reevaluated. IR inserted a catheter that drained 5.5 liters of serosanguinous fluid, some of which was sent for cytologic evaluation and demonstrated atypical ductal epithelial cells suspicious for low-to-intermediate grade ductal carcinoma in situ. The patient returned to radiology 4 days after placement of catheter and a hypoechoic lobulated mass with internal vascularity was identified in the central breast measuring 21 × 3 × 21 cm (Fig. 4). This mass underwent US-guided biopsy using a 14-gauge biopsy device. The pathology showed invasive micropapillary carcinoma. The patient's cancer was considered T4b N0, stage IIIB left breast invasive micropapillary carcinoma, grade 2, ER/PR positive, HER-2–negative with an associated malignant fluid collection.

A multidisciplinary team discussed the patient's imaging and pathology and determined the need for neoadjuvant chemotherapy, followed by surgical and radiation therapy. The patient was also recommended to be seen by wound care, infectious disease, nutrition, and geriatrics. Due to the clinical presentation, the initial surgical recommendation was left mastectomy and axillary dissection with final surgical recommendation determined by the patient's ultimate response to neoadjuvant chemotherapy. Technetium-99m bone scan and computed tomography (CT) of the chest/abdomen/pelvis were ordered as part of her staging studies. The whole-body bone scan showed a large well-circumscribed radiotracer activity occupying the anterior thorax and upper part of the abdomen, compatible with the known left breast mass and large fluid collection. Increased radiotracer activity involving the sacrum and bilateral posterior iliac bones were concerning for skeletal metastases. The patient was referred to IR for a pelvic bone biopsy that did not show metastatic disease. Staging CT of the chest/abdomen/pelvis showed the known left breast mass, a mildly prominent left axillary lymph node, no evidence of visceral metastases, and an insufficiency fracture of the right sacral ala. Clinically, after the initial placement of the catheter, several liters of fluid continued to drain daily.

Follow-up

Multiple catheter exchanges complicated the patient's clinical course due to debris clogging side holes and catheter site cultures showing Methicillin-resistant Staphylococcus aureus (MRSA) requiring antibiotic treatment. She continued to need multiple catheter exchanges as the breast continued to produce fluid daily with an average 500–750 cc a day. These complications combined with the patient's reluctance to initiate chemotherapy due to a family member's poor experience, delayed the start of chemotherapy by five months.

Before starting chemotherapy, the patient presented for a follow-up ultrasound that suggested that the malignancy had increased in size. The patient initiated chemotherapy, and despite seven cycles, the breast was still draining up to 1 liter of fluid a day at times. Follow-up imaging showed a decrease in size of the mass, measuring 17 × 14 × 3 cm, previously 23 × 17 × 6 cm. Mid-treatment, the patient was seen by surgery, and her operative plan was finalized for a left mastectomy and left axillary lymph node dissection with delayed breast reconstruction. She completed Taxol and started treatment with Adriamycin and Cyclophosphamide (AC). Subsequent follow-up imaging showed the mass further decreasing in size, measuring 13 × 9 × 3 cm. During neoadjuvant chemotherapy, the left breast fluid drainage stopped. The patient's treatment course was prolonged by multiple IR drain

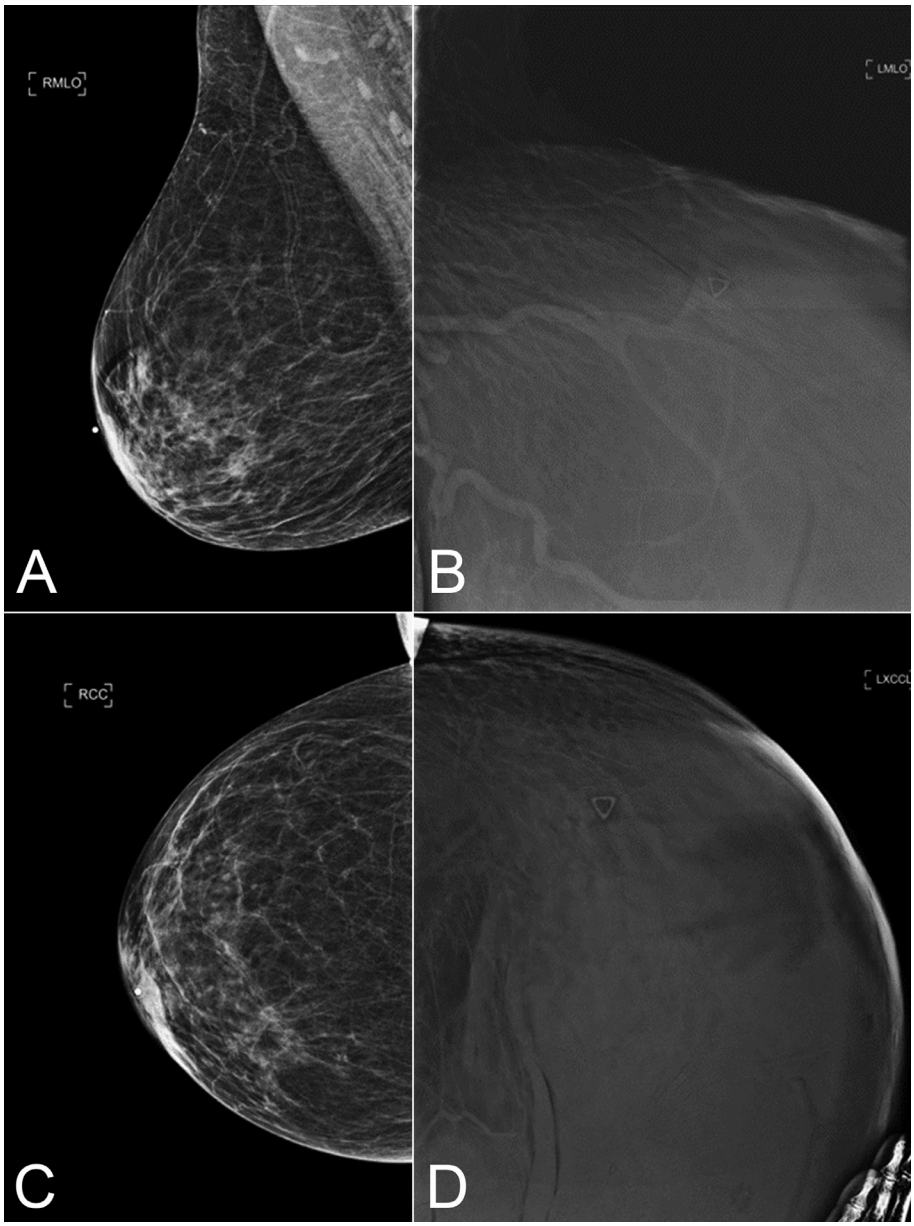

Fig 2 – Bilateral MLO and CC mammographic views were obtained and demonstrated a markedly enlarged left breast (B, D), asymmetric from the right (A, C) without a discrete mass. Triangular marker applied to the skin of the upper outer left breast marked the site of clinician noted palpable area of concern for which there was no discrete mammographic correlate.

placements and MRSA positive catheter cultures requiring antibiotic treatment. Ultimately, she did not complete the entire course of neoadjuvant AC as it was thought to delay the time to surgery further, so the patient proceeded to surgery.

Surgical pathology showed a residual 8 cm of invasive carcinoma with 60% cellularity that invaded the skeletal muscle and extended to 0.5 mm of the deep surface. The surgical team removed seventeen lymph nodes at the time of the axillary dissection, all of which were negative for metastatic disease. The patient was advised to complete the three remaining cycles of AC after surgery but declined. She agreed to take endocrine therapy after radiation; however, she ultimately declined endocrine therapy. Post-operative surveillance breast imaging has been negative including a left chest wall US and right breast mammographic imaging.

Discussion

IMPC is a rare variant of invasive ductal carcinoma of the breast, accounting for 0.7%–4 % of breast cancers [1–5]. This variant has been described as clinically aggressive due to its high frequency of lymphovascular invasion, axillary nodal metastases, and a greater degree of loco-regional recurrence [4,5]. Micropapillary carcinoma is characterized by tufts of

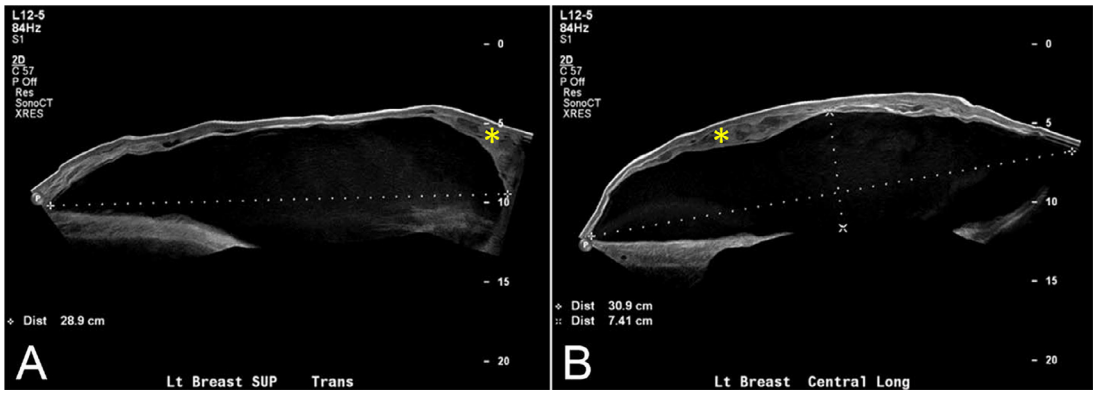

Fig 3 – Left breast ultrasound showed a large fluid collection (A, B) measuring 31 x 7 x 29 cm that laterally displaced the fibroglandular tissue (yellow asterisk). Given the large fluid collection in the breast, the radiologist recommended Interventional Radiology (IR) consultation for therapeutic and diagnostic drainage of fluid after which the breast could be reevaluated. IR inserted a catheter that drained 5.5 liters of serosanguinous malignant fluid "(Color version of figure is available online.)"

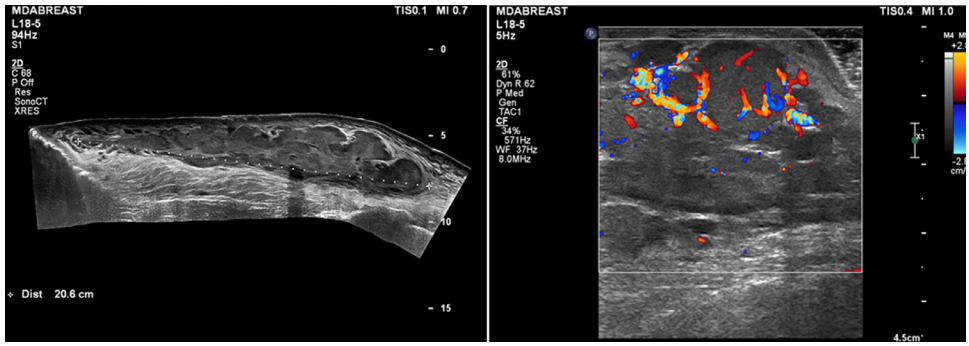

Fig 4 – After a catheter was inserted into the left breast to drain the fluid collection, the patient returned for breast ultrasound. A hypoechoic irregular mass (A) with internal vascularity (B) was identified in the central breast measuring 21 x 3 x 21 cm. This mass underwent US- guided core biopsy with pathology IMPC.

cells arranged in pseudopapillary structures devoid of fibrovascular cores and surrounded by empty, clear spaces lined by delicate strands of fibrocollagenous stroma [7]. Clinically, this mass can present as a palpable mass or an imaging-detected mass [4,6].

Mammographically, IMPC can present as a mass with or without microcalcifications, microcalcifications only, a focal asymmetry, an asymmetry, an architectural distortion, or be mammographically occult [4,5]. Additional mammographic features include irregular shape, spiculated margins, and high density [4,5]. Sonographically, IMPC can be seen as a mass, an architectural distortion, or be sonographically occult [4]. On MRI, IMPC has presented as an enhancing mass with irregular shape and spiculated or irregular margins and possible associated nonmass enhancement [4,5].

Suspicious regional lymphadenopathy has been noted with IMPC including axillary, internal mammary, and supraclavicular disease with lymph node metastases, ranging from 62%–90.5 % of cases [4,8,9]. Given the propensity of nodal involvement, careful evaluation of the regional nodal basins at ultrasound will aid in the assessment of nodal involvement [4]. Small micropapillary carcinomas have been shown to have the same proclivity for lymphatic spread and nodal dissemination as larger micropapillary carcinomas despite their small size. Invasive micropapillary carcinomas less than 5 mm can have lymph node metastasis at a rate of 75% [10].

Conclusion

This case report highlights a unique presentation of invasive micropapillary carcinoma as a large mass with associated fluid collection and no regional lymph node involvement. One important clinical pearl to learn from this case is how to approach a breast with an extensive fluid collection that may limit accurate assessment of a mass. In this case, the radiologist recommended a drain placement after which the patient was instructed to return to breast ultrasound for reassessment of the breast. In this patient, the drain insertion was therapeutic to the patient relieving severe breast discomfort and was diagnostic in that it demonstrated malignant fluid.

Additionally, the removal of fluid allowed the underlying mass to be better characterized and allowed for improved access to the mass to perform imaging-guided percutaneous biopsy and subsequent surgery.

Patient Consent Statement

The authors have written confirmation of informed consent from the patient for publication.

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