

CASE REPORT

Recurrence Screening of Undifferentiated Pleomorphic Sarcoma with Giant Cells of the Breast

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SUMMARY

Background: Undifferentiated pleomorphic sarcoma (UPS) of the breast is a rare mesenchymal tumor that is not commonly encountered in clinical settings. Given its high recurrence rate, close monitoring, and follow-up are strongly recommended.

Methods: In this case, the recurrence of UPS with giant cells of the breast was screened through ultrasound imaging and tumor marker tests, including CA 15-3 and CA 72-4.

Results: Following recurrence, the patient achieved partial clinical remission after six cycles of epirubicin-based adjuvant chemotherapy. In accordance with the patient's preference, a left mastectomy was performed. Postoperatively, the patient's condition stabilized, with a smooth and satisfactory recovery.

Conclusions: This case demonstrates that the combined evaluation of abnormal carbohydrate antigen expression and ultrasound features can enhance the diagnostic accuracy of suspected recurrent nodules following surgery for UPS of the breast.

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KEYWORDS

undifferentiated pleomorphic sarcoma, breast, recurrence, CA 15-3, CA 72-4, ultrasound features

INTRODUCTION

Undifferentiated pleomorphic sarcoma (UPS), formerly known as malignant fibrous histiocytoma (MFH), is a rare and highly aggressive soft tissue sarcoma originating from mesenchymal tissue, most commonly occurring in the extremities and retroperitoneum, with breast involvement being exceptionally rare [1]. The majority of UPS of the breast occur in middle-aged and elderly women, although isolated instances have been documented in younger women, and it typically presents clinically as a breast mass that gradually enlarges or exhibits rapid recent growth, with or without accompanying pain [2]. The etiology of UPS of the breast remains unclear; however, it is thought to be associated with common factors that contribute to changes in soft tissue [3]. Due to its rarity and the absence of large-scale stud-

ies on UPS, understanding of this disease is limited compared to more common types of breast cancer, and optimal management strategies have yet to be established [4]. Therefore, we present a case study that outlines the management of postoperative recurrence monitoring in UPS of the breast.

CASE PRESENTATION

The present study has received the written informed consent from the patient aged 48 years old. This female patient was admitted for further evaluation and treatment due to abnormal expressions of CA 15-3 and CA 72-4 detected during a postoperative follow-up for UPS of the breast. The patient had previously undergone a left breast quadrantectomy at another facility. The postoperative pathology report indicated a diagnosis consistent with a mesenchymal malignant tumor. Immunohistochemical analysis revealed the following results: Ki-67 (50%), SMA (-), Vimentin (+), PR (-), ER (-), and CD68/KP1 (+).

Three months post-surgery, during a follow-up visit, elevated levels of CA 15-3 and CA 72-4 were observed, with specific results of CA 15-3: 25.65 U/mL and CA 72-4: 7.59 U/mL. A comprehensive ultrasound examination identified a solid mass in the left breast along with subcutaneous fluid accumulation at the surgical site, as well as right breast hyperplasia accompanied by multiple nodules (Figure 1A and B). Considering the patient's medical history, clinical presentation, tumor markers, ultrasound findings, and pathology results, a diagnosis of recurrent UPS of the breast was established. In response, the patient received an adjuvant chemotherapy regimen consisting of epirubicin and ifosfamide for six cycles, followed by a left mastectomy. The subsequent pathology report confirmed that the breast lesions were consistent with a mesenchymal malignant tumor. The patient's condition stabilized postoperatively, and she experienced a good recovery, leading to her eventual discharge.

DISCUSSION

UPS is a rare malignant soft tissue tumor characterized by high malignancy and aggressive invasiveness, originating from mesodermal and mesenchymal tissues. The most common sites of occurrence include the connective and subcutaneous tissues of the limbs, followed by the gastrointestinal tract, while instances of UPS in the breast are exceedingly rare [5]. The clinical presentation primarily consists of a gradually enlarging breast mass or a significant recent increase in size, with or without accompanying pain. Based on the classification of soft tissue tumors, UPS is categorized into three types: 1) high-grade UPS (pleomorphic cell type): tumor cells exhibit pronounced pleomorphism and a radiating structure, with spindle-shaped and short spindle-shaped fi-

broblast-like cells arranged in a radiating pattern, while pleomorphic areas contain numerous deeply stained irregular nuclei of giant cells intermingled with inflammatory and tumor cells; 2) inflammatory UPS (inflammatory cell type): foam-like yellow tumor cells of varying degrees of differentiation are distributed in clusters or diffusely, intermixed with a substantial number of inflammatory cells, particularly neutrophils; 3) UPS with giant cells (giant cell type): fibroblasts, histiocytes, and osteoclast-like giant cells scattered throughout the tumor tissue form nodular structures, often accompanied by hemorrhage and necrosis. This case was diagnosed with UPS of giant cell type in breast tissue following pathological examination.

Due to its high propensity for recurrence, UPS of the breast necessitates close monitoring and regular assessments to evaluate patient prognosis. Kaswan et al. [6] noted that the recurrence rate of breast UPS can reach as high as 44%, aligning with the clinical characteristics observed in this case. The most commonly used tumor markers for breast cancer are CA 15-3 and carcinoembryonic antigen (CEA). However, both markers exhibit suboptimal diagnostic sensitivity and specificity. According to the literature, among patients with confirmed recurrence and metastasis of breast cancer, only 50% to 60% exhibit elevated levels of CEA, whereas 75% to 90% show elevated levels of CA 15-3 [7]. CA 15-3 is highly expressed in tumor cells, particularly in patients with metastatic lesions, where its positivity rate is significantly elevated. Previous study conducted by Geraghty et al. [8] has shown that the levels of CA 15-3 in breast cancer patients correlate with tumor cell burden. Consequently, CA 15-3 levels are associated with clinical assessments and treatment strategies for patients. In 1991, Colcher et al. [9] from the National Cancer Institute reported the identification of a novel tumor-associated glycoprotein, CA 72-4. Previous studies have confirmed that CA 72-4 is a mucin-like carcinoembryonic antigen. The combined detection of CA 72-4 and CA 15-3 enhances diagnostic sensitivity and specificity, providing valuable insight into the monitoring of postoperative recurrence and metastasis [10,11]. In this case, three months post-surgery, elevated levels of CA 15-3 and CA 72-4 were observed during a follow-up visit, with specific results of CA 15-3 at 25.65 U/mL and CA 72-4 at 7.59 U/mL.

In addition, ultrasound also plays a critical role in monitoring the recurrence of UPS of the breast [12]. However, given the atypical clinical presentation and non-specific imaging features, the sensitivity and specificity of ultrasound alone for detecting recurrence of UPS of the breast are limited. In this case, follow-up ultrasound showed glandular thickening in both breasts (1.4 cm on each side) with heterogeneous parenchymal echotexture and no significant ductal dilation. A 3.2 x 2.6 x 1.9 cm hypoechoic mass with irregular shape, shallow lobulation, mild posterior enhancement, and internal blood flow (RI: 0.70) was found in the upper outer quadrant of the left breast. In the inner quadrant of the right breast,

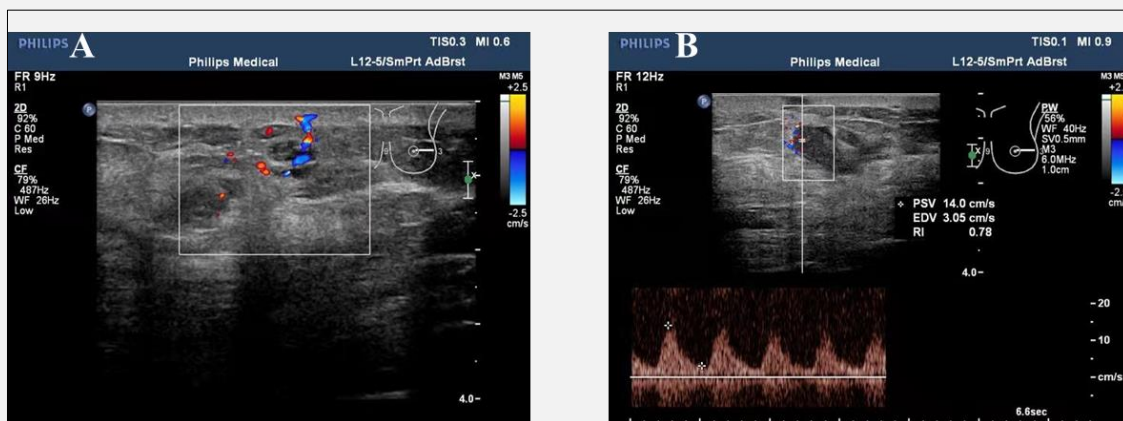


Figure 1A. Two-dimensional ultrasound imaging of recurrent lesions in UPS of the breast.

Figure 1B. Spectral doppler ultrasound images of recurrent lesions in UPS of the breast.

two smooth-margined hypoechoic nodules, measuring 0.6 x 0.4 cm and 0.8 x 0.3 cm, were also identified. Notably, the ultrasound features of this condition should be carefully distinguished from those of phyllodes tumors and giant fibroadenomas of the breast.

In summary, this case demonstrates that combining the evaluation of abnormal CA 15-3 and CA 72-4 expression with ultrasound findings can enhance the diagnostic accuracy for suspected recurrent nodules following surgery for UPS of the breast.

Declaration of Interest:

None.

References:

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