

Case Report

A case of myxoid liposarcoma of the breast

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Abstract: A 70-year-old woman visited a local hospital complaining of a nodule in the right breast, present since 1 month. She was referred to our hospital for further evaluation. Following mammotome (MMT) biopsy, the nodule was diagnosed as myxoid/round cell liposarcoma. She underwent total mastectomy of the right breast. Histological analysis indicated that the tumor was almost entirely composed of proliferating small round mesenchymal cells in an amyxoid matrix background with capillary-like vessels with partial necrosis (<10%). Immunohistochemically, p53 positive cells were seen focally (<1%) only, and the Ki-67 labeling index was approximately 20%. Since the surgical margin was histologically positive despite pathologic findings of high-grade malignancy, adjuvant treatment involving local radiation therapy (60Gy) was administered. The patient was free from any symptoms of local recurrence and metastases 1 year and 8 months after surgery.

Keywords: Myxoid liposarcoma, round cell component, breast

Introduction

Breast sarcomas are malignant tumors arising from the mesenchymal tissue of mammary glands and are regarded as extremely rare, representing approximately 0.1–0.3% of all malignant breast tumors [1-3]. Microscopically, most breast sarcomas comprise malignant fibrous histiocytomas, followed by liposarcomas and fibrosarcomas [3]. Liposarcoma of the breast was first described by Neumann in 1862 [4] and accounts for 3–24% of all breast sarcomas [3].

Liposarcoma is one of the most common soft tissue sarcomas in adults and frequently arises in the superficial and deep soft tissues of the extremities and the retroperitoneum. Although liposarcoma shows variable histologic features, currently, it is classified into 4 major histologic subtypes: well-differentiated, myxoid/round cell, dedifferentiated, and pleomorphic [5]. More than 95% myxoid/round cell liposarcomas have either the characteristic t(12;16)(q13;p11) or t(12;22)(q13;q12) chromosomal translocation that results in the fusion of *TLS-CHOP* or *EWS-CHOP* [6-10]. The fusion proteins

derived from both of these translocations have been shown to play an important role in the oncogenesis of myxoid/round cell liposarcoma. In addition, identification of the fusion genes associated with specific tumor types aids molecular diagnosis of various types of sarcomas, including myxoid/round cell liposarcoma [11].

This report describes an extremely rare case of myxoid breast liposarcoma that was successfully treated.

Case report

Clinical history

A 70-year-old woman visited a local hospital in February 2011, complaining of a nodule in the right breast, present since 1 month. She was referred to our hospital for further evaluation in July 2011.

Ultrasonography revealed a relatively well-demarcated lobulated mass of 51 × 40mm with cystic change (**Figure 1A, 1B**). A slightly high-intensity lesion on T1-weighted image and high-intensity lesion on T2-weighted image were

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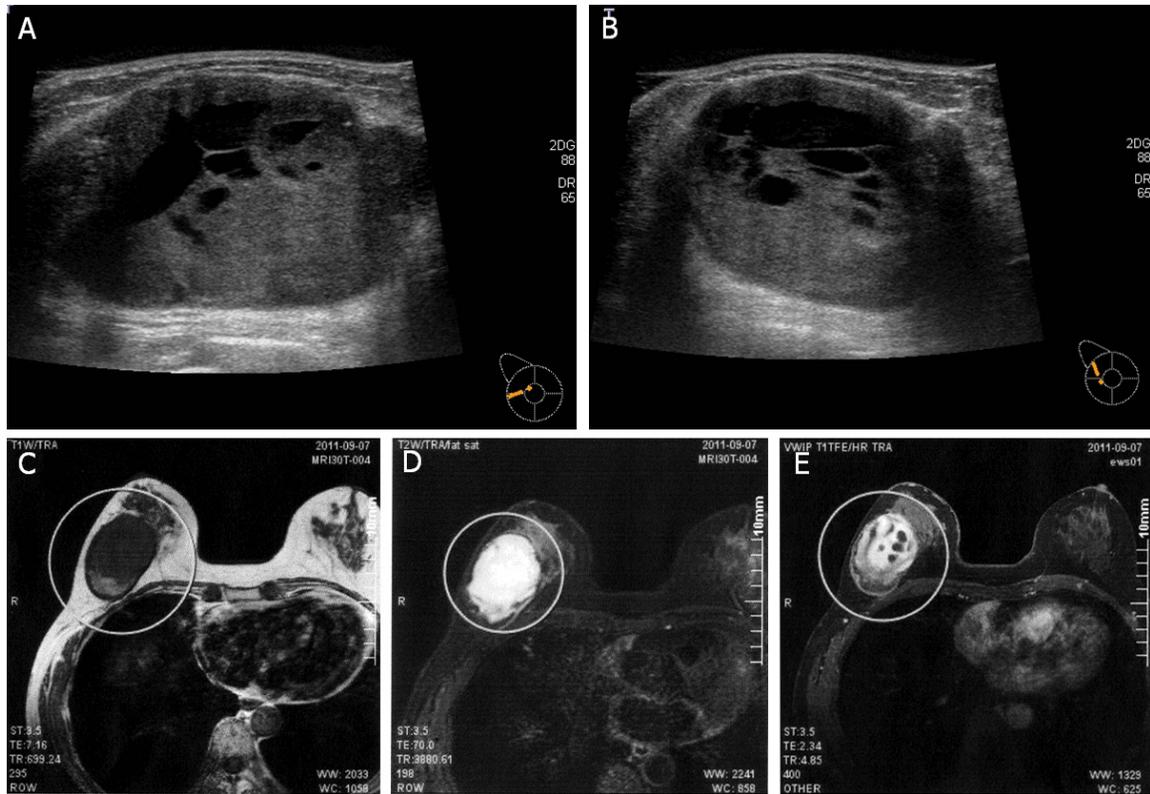


Figure 1. The breast tumor as observed on ultrasonography and magnetic resonance imaging. A, B: Ultrasonography revealed a relatively well-demarcated lobulated mass of 51 × 40mm with cystic change. C, D: MRI indicating as lightly high intensity lesion on a T1-weighted image and a high intensity lesion on a T2-weighted image. E: High-intensity tumor on diffusion weighted imaging (DWI), reflecting the presence of a lesion with cystic change.



Figure 2. Gross section of the tumor shows a well-demarcated yellowish tumor with focal cystic change.

observed on magnetic resonance imaging (MRI) (Figure 1C, 1D). This lesion also showed high intensity on diffusion-weighted imaging (DWI), suggesting the presence of cystic change (Figure 1E).

Following MMT biopsy, the tumor was diagnosed as a myxoid/round cell liposarcoma. The

patient underwent total mastectomy of the right breast.

Because the tumor was pathologically diagnosed as amyloid liposarcoma, and the surgical margin was histologically considered positive, adjuvant treatment involving local radiation therapy (60Gy) was administered. During the radiation therapy, the patient complained of dizziness. MRI scan indicated the presence of a tumor at the left cerebellopontine angle that had weak low intensity on a T1-weighted image and weak high intensity on T2-weighted image. In view of the clinical history of myxoid liposarcoma, a metastatic tumor or meningioma were also suspected. The tumor was successfully resected and histologically diagnosed as a meningioma with no evidence of metastatic myxoid liposarcoma.

The patient did not experience any symptoms of local recurrence and metastases 1 year and 8 months after surgery.

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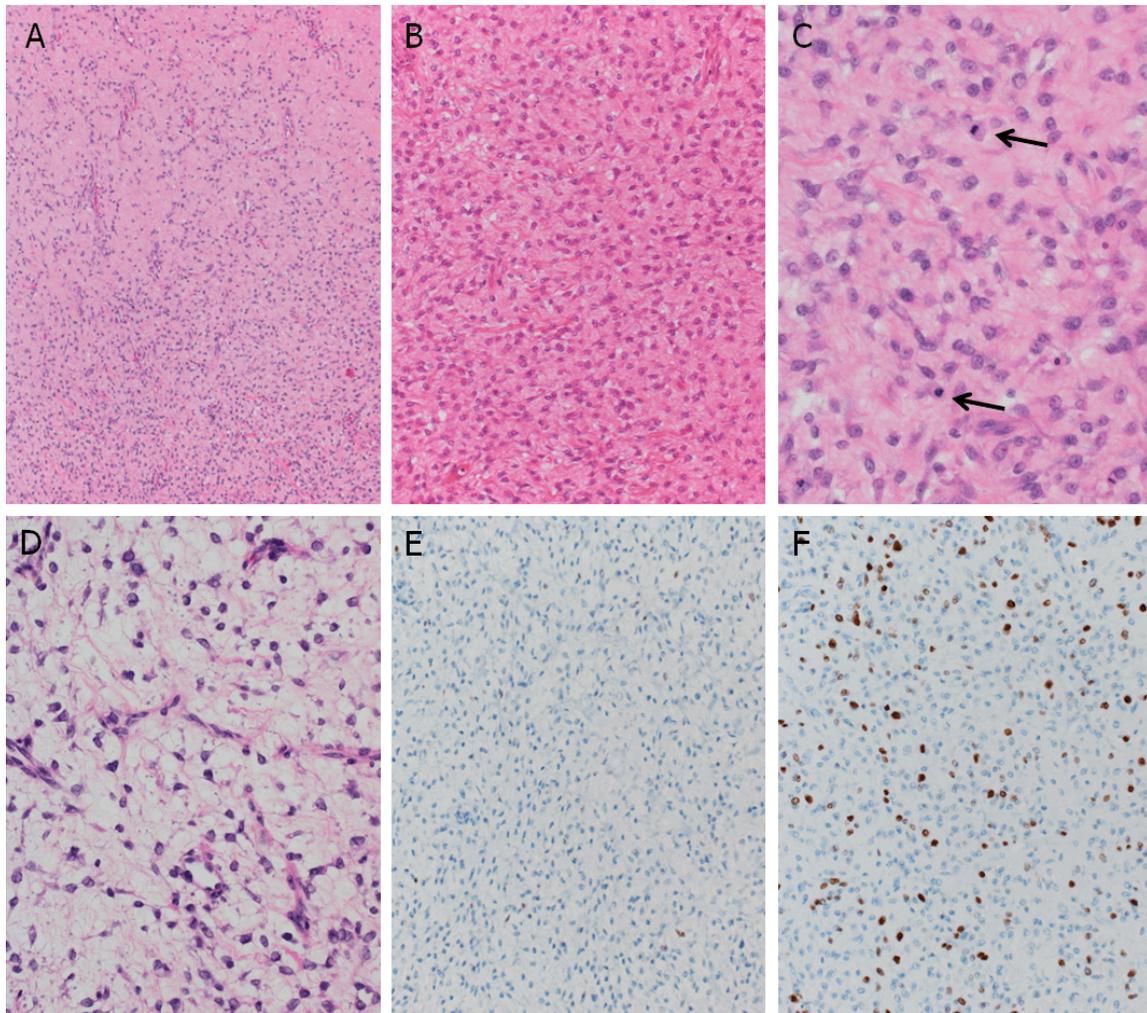


Figure 3. Histologic features of the breast tumor. A, B: The tumor was histologically almost entirely composed of proliferating small round mesenchymal cells in amyloid matrix background with capillary-like vessels. C: Frequently seen mitosis (arrows). D: Lipoblasts scattered throughout the tumor. E: p53-positive cells seen only focally (<1%). F: The Ki-67 labeling index was approximately 20%.

Pathological findings

The gross section showed a yellowish tumor with focal cystic change (**Figure 2**). This tumor was histologically almost entirely composed of proliferating small round mesenchymal cells in amyloid matrix background with capillary-like vessels (**Figure 3A, 3B**). Mitosis was frequently seen (**Figure 3C**), and lipoblasts were scattered throughout the tumor (**Figure 3D**). Partial necrosis was also noted (<10%). Immunohistochemical staining was also performed using the streptavidin-biotin method with p53 (Clone: DO-7, Dako) and Ki-67 (Clone: MIB-1, Dako) antibodies. Immunohistochemically, p53 positive cells were seen focally (<1%) only, and the Ki-67

labeling index was approximately 20% (**Figure 3E, 3F**).

Detection of fusion transcript

RNA extraction from paraffin-embedded tissue was performed as previously described [12]. The primer pairs used to identify the chimeric fusion genes are listed in **Table 1** [11]. After polymerase chain reaction (PCR), an aliquot of the PCR product was electrophoresed on a 2% agarose gel and stained with ethidium bromide. As a positive control to show the integrity of mRNA in the sample, PCR of the ubiquitously expressed GAPDH gene transcript was performed. However, neither *TLS-CHOP* nor *EWS-*

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Table 1. Primer sequences

		PCR product size
TLS-CHOP type1, 2-F	GACAGCAGAACCAGTACAACAGCAG	TLS-CHOP type1: 379bp
TLS-CHOP type1, 2-R	GCTTTCAGGTGTGGTGATGTATGAAG	TLS-CHOP type1: 103bp
TLS-CHOP type3-F	gaagtgaccgtgggtgctcaa	208bp
TLS-CHOP type3-R	ggcaagctggtctgatgcct	
TLS-CHOP type4-F	cctcagggctatggacagcagaa	208bp
TLS-CHOP type4-R	ggctggaacaagctccatgtagc	
TLS-CHOP type5-F	gcagtcctcctaccctggct	106+αbp
TLS-CHOP type5-R	gctgcttcaggtgtggat	
TLS-CHOP type8-F	cccctaaaccagatggccca	190bp
TLS-CHOP type8-R	ggcaagctggtctgatgcct	
TLS-CHOP type9-F	acggacacttcaggctatgg	159bp
TLS-CHOP type9-R	ctggaatacagccacatctgtt	
EWS-CHOP-F	tggatcctacagccaagctc	EWS-CHOP type1: 111bp
EWS-CHOP-R	gctgcttcaggtgtggat	EWS-CHOP type1: 363bp
GAPDH-F	GAAGGTGAAGGTCGGAGTC	226bp
GAPDH-R	GAAGATGGTGATGGGATTTC	

CHOP was detected in this case, although the integrity of the mRNA as assessed by the expression of GAPDH was confirmed.

Discussion

Sarcomas arising from other sites have shown to have similar clinical history and biological behavior to breast sarcomas [1], suggesting that similar therapeutic protocols can be used. Postoperative radiotherapy has proved to alleviate local recurrence, especially when involved margins show an infiltrative growth pattern [13]. Furthermore, radiotherapy has shown to be effective in preventing local recurrence and should be delivered as a neoadjuvant therapy [14]. On the other hand, the impact of chemotherapy on patients with primary extremity soft tissue sarcomas remains controversial; however, the chemotherapeutic effect on myxoid/round cell liposarcoma has been gradually shown [15, 16]. Patients who received ifosfamide-based chemotherapy showed significant improvement with respect to survival compared to those who did not receive chemotherapy [15]. In addition, neoadjuvant trabectedin has been demonstrated to be effective in patients with locally advanced myxoid liposarcoma [16].

In this case, surgical resection was performed without neoadjuvant preoperative chemotherapy, and the surgical margin of the resected

specimen was considered positive. Postoperative radiotherapy was performed in this case to prevent local recurrence. Adverse prognostic factors in localized soft tissue myxoid liposarcoma include a high-histological grade >10% round cell component, necrosis >5%, and overexpression of p53 >10% of positive cells [17]. In addition, p53 overexpression is relatively rare (5–30%) in myxoid liposarcoma [17-19] and tends to be seen

in conjunction with *TLS-CHOP* type 2 fusion [17]. In this case, extensive areas with round cell component were observed; although p53 overexpression was not seen and only focal (<5%) necrosis was observed.

Thus far, at least 9 different types of *TLS-CHOP* and 2 types of *EWS-CHOP* fusion genes have been reported, and either can be detected in almost all myxoid liposarcoma cases [10, 11, 17]. However, neither of the fusion genes were detected in this case.

The patient is undergoing follow-up by close examination, and thus far, there is no evidence of local recurrence or metastasis 1 year and 6 months after surgery.

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Disclosure of conflict of interest

The authors declare no conflicts of interest.

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