Case Report

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Primary Breast Pleomorphic Liposarcoma Evaluation With MRI and Pathology: A Rare Case

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Key Points

- Magnetic resonance imaging makes an important contribution to demonstrating the fat content in the diagnosis of liposarcoma.
- When a spindle cell tumor is detected in the mammary gland which is an epithelial organ, it should be differentiated from metaplastic carcinoma and malignant phyllodes tumor by performing large tissue sampling and immunohistochemical studies for the diagnosis of sarcoma.

A 22-year-old female patient complained of a mass in the left breast. The patient had a first degree-family history of liposarcoma in the eye. Rapid enlargement of the breast was described in the anamnesis.

Dynamic contrast-enhanced breast magnetic resonance imaging (MRI) was performed for the patient who presented to another center with heterogeneous mass information on breast ultrasound. The mass showed heterogeneous fat intensity in T-1 weighted (T1W) examination (black arrowheads - Figure 1a) in the MRIs. In addition, signal reduction was observed with fat-suppressed T1W images with Spectral Attenuated Inversion Recovery sequence in areas where the mass contained macroscopic fat (asterisk - Figure 1b) and a spontaneous hyperintense area (arrowhead- Figure 1b) consistent with a focal hemorrhage. A curvilinear hypointense structure (black arrowhead- Figure 1c) shows a vascular feeder within the well-circumscribed mass. The high signal in the fat-suppressed Short Tau Inversion Recovery sequence of MRI examination reflected the high-water content of the lesion while reduced signal was observed in macroscopic fat areas within the lesion. In the first minutes following intravenous contrast administration, the tumor showed intense heterogeneous enhancement along with necrotic areas (black arrow - Figure 2a) in places where no enhancement was seen. Contrast washout was observed in the mass

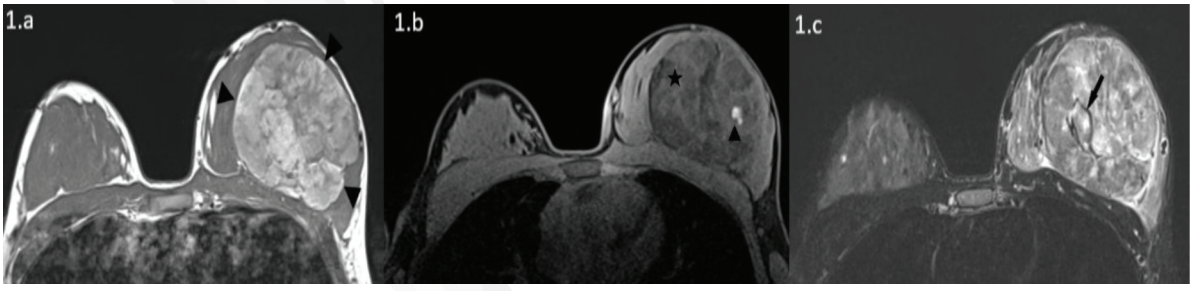

Figure 1. Turbo spin echo – T1 weighted **(1a)**, pre-contrast fast low angle shot T1 weighted **(1b)**, Short Tau Inversion Recovery (STIR) (**1c**) axial image of both breast magnetic resonance imaging examination. The mass that expands the left breast asymmetrically compared to the right showed heterogeneous fat intensity (black arrowheads - 1a), signal reduction with fat-suppressed T1W images with spectral attenuated inversion recovery in areas where the mass contained macroscopic fat (asterisk - 1b) and a spontaneous hyperintense area (arrowhead - 1b) consistent with a focal hemorrhage. STIR image shows high signal reflected the high-water content of the lesion, a vascular feeder as curvilinear hypointense structure (black arrowhead- 1c) within the well-circumscribed mass

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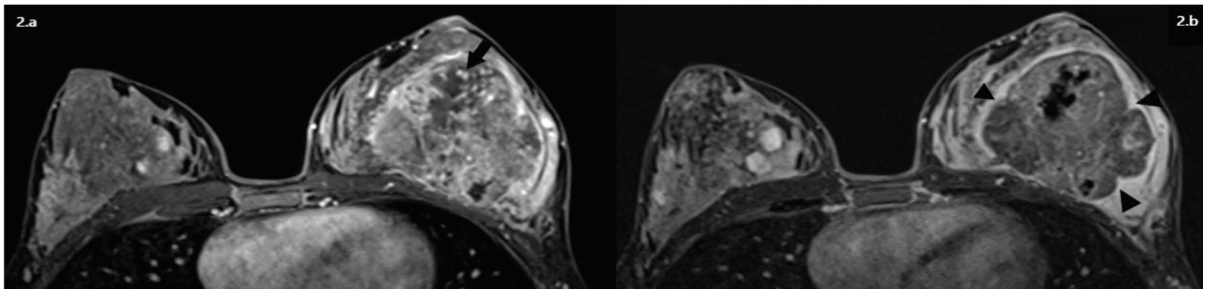

Figure 2. Subtraction images of dynamic contrast-enhanced T1W images. In early phase, the tumor showed intense heterogeneous enhancement along with necrotic areas (black arrow - **2a**) in places where no enhancement was seen. In the late phase, contrast washout was observed in the mass, in addition to the continuation of peripheral enhancement (black arrowheads - **2b**)

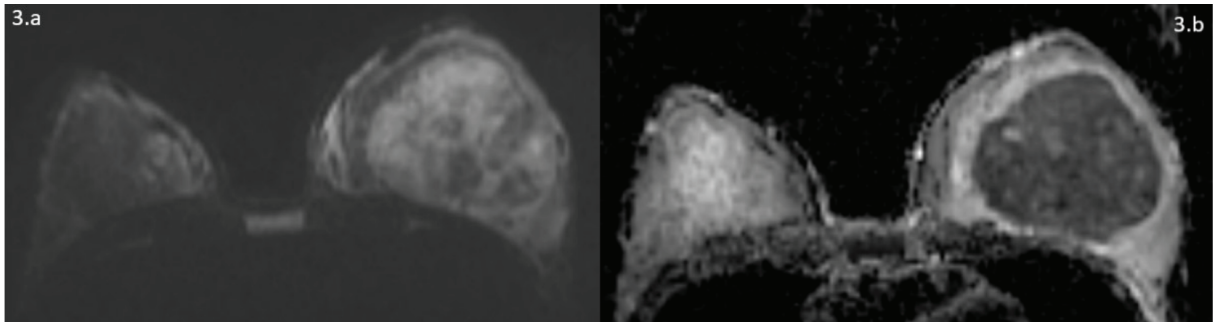

Figure 3. Diffusion weighted image (DWI; b value: 1000) (**3a**) and Apparent Diffusion Coefficient (ADC) map images (**3b**). The tumor was seen to have a high signal on DWI and low signal on the ADC map. The significant diffusion restriction suggested the presence of high cellularity and possibly high-grade tumor

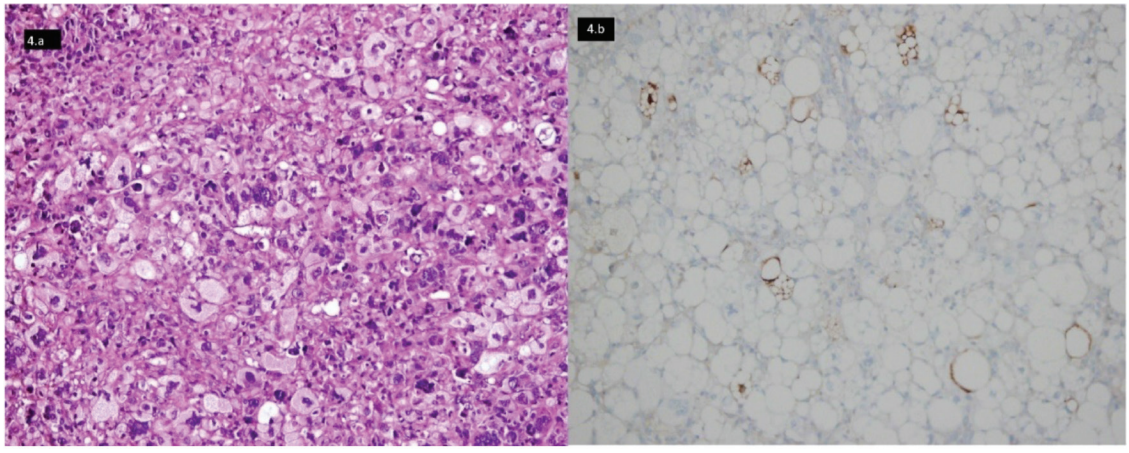

Figure 4a. The tumor was composed of high-grade cells with varying numbers of pleomorphic and atypical multinucleated tumor cells (H&E, X 200), **4b.** S100 positivity

in the late phase (sixth minute) dynamic image, in addition to the continuation of peripheral enhancement (black arrowheads - Figure 2b). The tumor was seen to have a high signal on diffusion-weighted image and low signal on the apparent diffusion coefficient map. The significant diffusion restriction suggested the presence of high cellularity and possibly high-grade tumor (Figures 3a, 3b). Tru-cut biopsy of the mass indicated the diagnosis of a sarcoma with possible pleomorphic liposarcoma. The patient underwent left mastectomy. The tumor was composed of high-grade cells with varying numbers of pleomorphic and atypical multinucleated tumor cells (H&E stain - Figure 4a) and S100 positivity in the tumor cells (Figure 4b). Although Vimentin and S100 positivity were observed by immunohistochemistry, the sections were negative for keratins and SOX-10. The tumor was diagnosed histologically as a pleomorphic liposarcoma (Fédération Nationale des Centres de Lutte Contre le Cancer grade 3). Since the patient also had a family history, *TP53* gene mutation was detected in the genetic research performed after the surgery, and Li Fraumeni syndrome was diagnosed. MRI made an important contribution in the current case, albeit with low specificity, by demonstrating the fat content in the diagnosis of liposarcoma (1). When a spindle cell tumor is detected in the mammary gland, which is an epithelial organ, it should be differentiated from metaplastic carcinoma and malignant phyllodes tumor by performing large tissue sampling and immunohistochemical studies for the diagnosis of sarcoma (2-4). Wide excision is important in the treatment and adjuvant chemotherapy-radiotherapy may be required.

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Authorship Contributions

Surgical and Medical Practices: R.G.C., A.B., R.Y.; Design: R.Y.; Analysis or Interpretation: R.G.C., A.B., R.Y.; Literature Search: R.G.C., A.B., R.Y.; Writing: R.G.C., A.B., R.Y.

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