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Spindle Cell Sarcoma Mimicking Supraclavicular Lymph Node Metastasis of Breast Cancer

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

ABDE 1 **Se Hyun Paek**
DF 2 **Kyoung Eun Lee**
DF 3 **Han Su Kim**
DF 1 **Joo Hyun Woo**
ADEG 1 **Woosung Lim**

1 Department of Surgery, College of Medicine, Ewha Womans University, Seoul, South Korea
2 Department of Internal Medicine, College of Medicine, Ewha Womans University, Seoul, South Korea
3 Department of Otorhinolaryngology, Head and Neck Surgery, College of Medicine, Ewha Womans University, Seoul, South Korea

Corresponding Author: Woosung Lim, e-mail: limw@ewha.ac.kr
Conflict of interest: None declared

Patient: Female, 45
Final Diagnosis: Spindle cell sarcoma
Symptoms: Palpable mass
Medication: —
Clinical Procedure: Surgery and radiotherapy
Specialty: Surgery

Objective: Challenging differential diagnosis
Background: Sarcomas can develop *de novo* or secondary to radiotherapy after or during breast cancer treatment. Diagnosis can be challenging, as such, a sarcoma is often missed on routine follow-up imaging and often presents with dermatologic findings.
Case Report: Here, we present a case of a 45-year-old female who developed spindle cell sarcoma on her neck, which was mimicking supraclavicular lymph node metastasis of breast cancer.
Conclusions: Based on our report, we recommend a tissue biopsy with an immunohistochemistry profile when a mass suspicious for metastasis is found in patients with breast cancer.

MeSH Keywords: Breast Neoplasms • Sarcoma • Neoplasm Metastasis

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Background

Differentiating a distant lesion mass in a breast cancer survivor can be challenging [1]. Many patients have been misdiagnosed and have undergone several months of treatment for a relapse of breast cancer [1,2]. Sarcomas developing as primary malignancies of the neck are a very rare complication after radiation therapy. Radiation-induced spindle cell sarcoma arising in the lymph nodes is very rare and has seldom been described in the literature. Here, we present a case of spindle cell sarcoma mimicking supraclavicular lymph node metastasis of breast cancer.

Case Report

A 37-year-old premenopausal Asian female was diagnosed invasive ductal carcinoma of right breast. The patient underwent a right breast conserving surgery and level II axillary lymph node dissection. The size of cancer was 2.2×1.5 cm and 1 sentinel lymph node was positive; stage II (T2N1M0). Immunohistochemistry was positive for both estrogen receptor (ER) and progesterone receptor (PR), and 1+ for Her-2 expression. The patient received 4 cycles of Adriamycin and cyclophosphamide (#4 AC), and this was followed by 4 cycles of paclitaxel (#4T) every 3 weeks and radiation therapy after chemotherapy. After chemotherapy, tamoxifen therapy was started and was continued for 5 years. After her operation, tumor recurrence was monitored regularly (every 6 month during the first 5 years and annually after 5 years) using tumor marker, mammography, and ultrasonography.

At 7 years and 8 months after the initial diagnosis, the patient developed a palpable mass on the right side of her neck. A neck ultrasonography revealed conglomerated hypoechoic nodules on the right supraclavicular area and neck level IV (Figure 1A). The fine needle aspiration (FNA) biopsy result

showed malignant cells. A moderate hypermetabolic SUV 5.2 lesion on the right side of the neck at level IV was observed on the PET (positron emission tomography) study (Figure 1B). Based on the history and clinical findings, a supraclavicular lymph node recurrence of breast cancer was considered (since she had refused extended adjuvant endocrine therapy after the end of 5 years of tamoxifen therapy). An incisional biopsy was performed for definite diagnosis and immunohistochemistry results. Surprisingly, the surgical pathology results showed an undifferentiated spindle cell sarcoma. On microscope, atypical spindle cells were arranged in short and long fascicles, having tapering, hyperchromatic nuclei with eosinophilic cytoplasm amid fibrous stroma and significant mitotic figures (Figure 2A, 2B). Immunohistochemistry was positive for Vimentin (Figure 2C). It was negative for cytokeratin (CK), CD34, desmin, c-kit, smooth muscle actin (SMA) and S-100 protein (Figure 2D). These findings were consistent with undifferentiated spindle cell sarcoma. A decision was made to surgically remove (Rt. modified radical neck dissection: Rt. MRND) the tumor, and this would be followed by radiotherapy on the right side of the neck (right neck level III-IV, 66 Gy). On her recent follow-up examinations, all studies, including computed tomography, showed no evidence of any residual or metastatic lesion.

Discussion

Hormone receptor – positive breast cancers represent the majority of breast cancers around the world, affecting approximately 70% of women with breast cancer [3,4]. These cancers generally have a favorable prognosis; however, even though patients remain free of recurrence in the first 5 years, the risk of having the cancer recur elsewhere remains constant [5]. Approximately 33% of women with estrogen-receptor-positive breast cancer experience a recurrence, and over half of these recurrences arise more than 5 years after surgery [3–5]. Recurrence can be local, regional, or distant/metastatic [1].

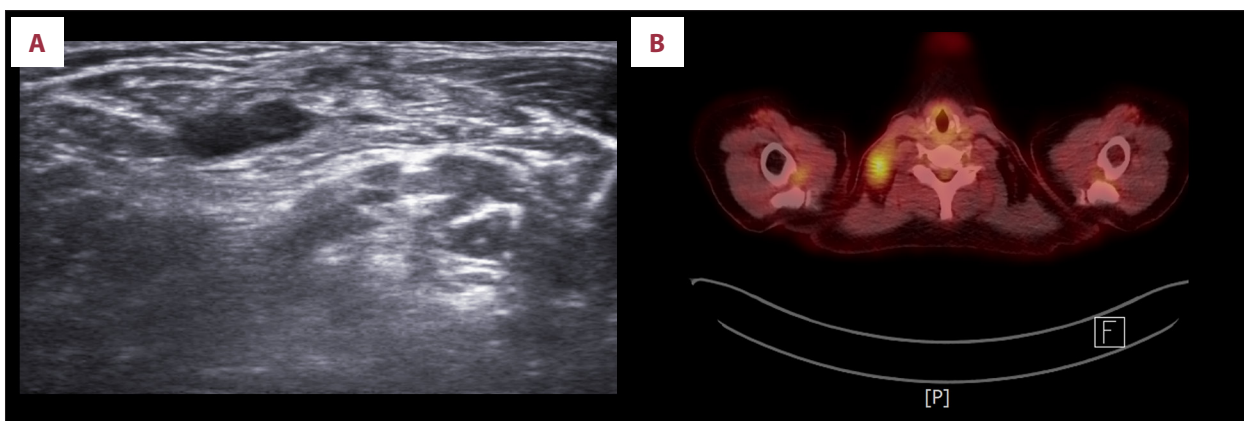


Figure 1. (A) A neck ultrasonography revealed conglomerated hypoechoic nodules on the right supraclavicular area and neck level IV. (B) A moderate hypermetabolic SUV 5.2 lesion on the right side of the neck at level IV.

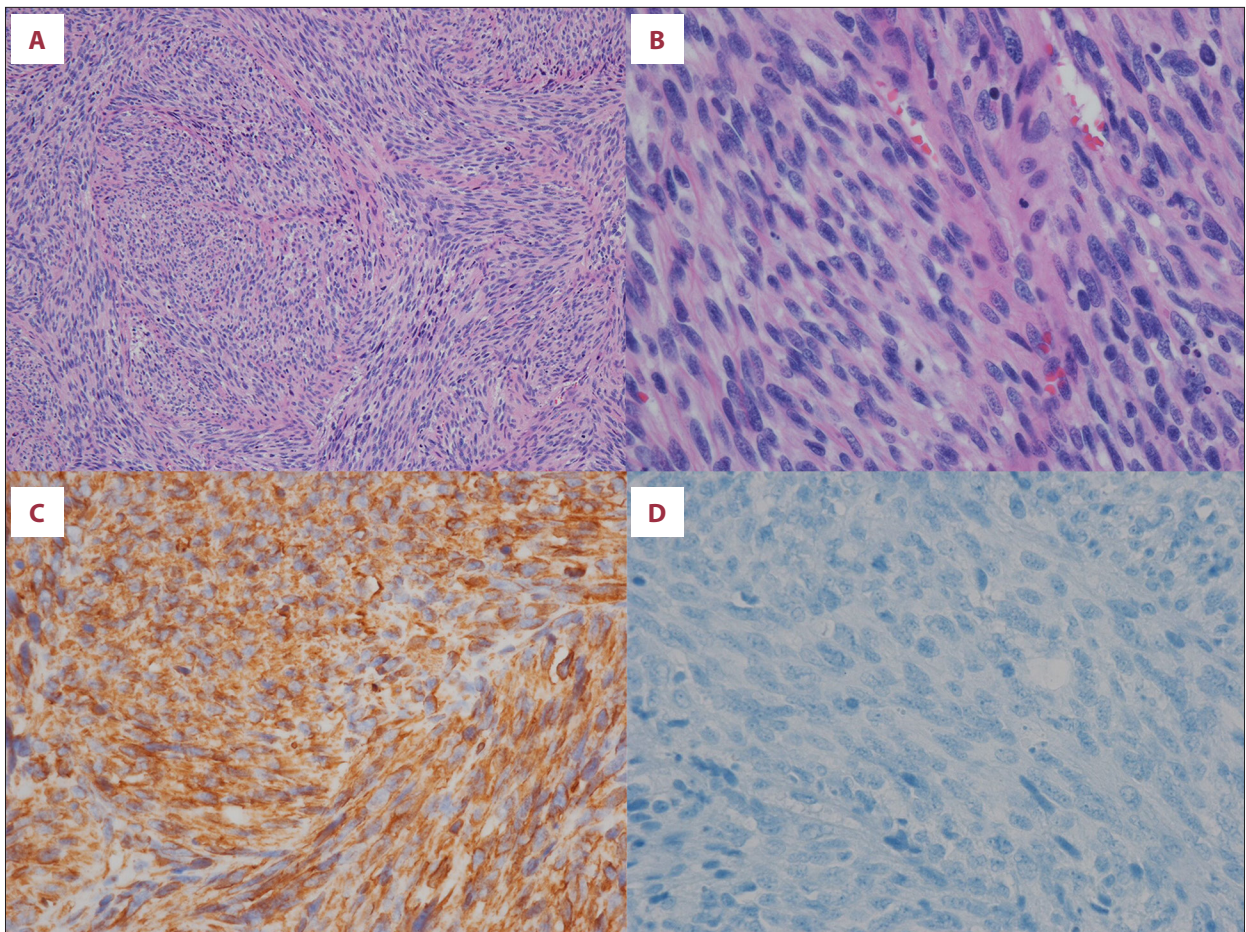


Figure 2. Immunohistochemical staining for undifferentiated spindle cell sarcoma. Atypical spindle cells arranged in short and long fascicles, having tapering, hyperchromatic nuclei with eosinophilic cytoplasm amid fibrous stroma and significant mitotic count (A) HES (100×), (B) HES (400×), (C) Vimentin positive (400×), and (D) PanCK negative (400×).

Differentiating a distant lesion mass in a breast cancer survivor is sometimes difficult [1]. Neck lesion mass of our patient was developed more than 7 years after surgery. Because she had refused extended adjuvant tamoxifen endocrine therapy, the possibility of a recurrence of breast cancer was very high. However, we performed an incisional biopsy for immunohistochemical evaluation to select a therapeutic regimen. There is value in undertaking a biopsy of a suspected recurrence, not only to make a definitive diagnosis but because a breast metastasis may not have the same tumor biology as the original breast tumor and, therefore, may require different treatment [2,6,7].

Spindle cell sarcoma occurs on nearly any of the connective tissues of the body [8]. The name “spindle cell” comes from the shape of the cells when they are viewed through a microscope [9,10]. Symptoms vary depending on where the cancer is found, although nonspecific symptoms such as fatigue and a general feeling of malaise are common. This cancer is often not caught until it has spread because symptoms can be

confused. Treatments may vary based on tumor size, progression of the disease, and the patient’s overall health status [11]. In most cases, after surgery, chemotherapy and/or radiation may be required. Unfortunately, the overall survival rate is less than 5 years since most spindle cell sarcoma cases are diagnosed in advanced stages [11,12].

Spindle cell sarcoma can develop for a variety of reasons [10]. Genetic predisposition is one factor, but it also may be caused by a combination of other factors, including injury and inflammation in patients that are already thought to be predisposed to such tumors. The development of spindle cells is a naturally occurring part of the body’s response to injury and radiotherapy can be one of the significant risk factor [13]. Radiation-induced sarcoma is a rare iatrogenic malignancy associated with poor outcomes [14]. Several studies have reported the incidence of radiation-induced sarcoma after breast cancer treatment [13–15], but radiation-induced spindle cell sarcoma arising in the supraclavicular lymph nodes has seldom been described in the literature. An early-stage radiation-induced

sarcoma is difficult to identify by physical examination due to radiation-induced changes, often leading to a misdiagnosis as recurrent breast carcinoma, thereby delaying an accurate diagnosis [14]. FNA biopsy cannot provide definitive information about the histologic architecture of radiation-induced sarcoma nor can FNA biopsy provide adequate material for an immunohistochemical evaluation [15]. So, core needle or incisional biopsies are required. Patients with breast cancer, especially those who have taken radiation therapy, should be considered for a possible radiation-induced sarcoma. The risk of a radiation-induced sarcoma remains high for more than 10 years [13,14]. Our patient underwent 5000 cGy radiotherapy on the supraclavicular area, and this may have led to the development of a sarcoma on her neck.

References:

1. Buonomo OC, Caredda E, Portarena I et al: New insights into the metastatic behavior after breast cancer surgery, according to well-established clinicopathological variables and molecular subtypes. *PLoS One*, 2017; 12: e0184680
2. Criscitiello C, Andre F, Thompson AM et al: Biopsy confirmation of metastatic sites in breast cancer patients: Clinical impact and future perspectives. *Breast Cancer Res*, 2014; 16: 205
3. Lumachi F, Brunello A, Maruzzo M et al: Treatment of estrogen receptor-positive breast cancer. *Curr Med Chem*, 2013; 20: 596–604
4. Lim E, Metzger-Filho O, Winer EP: The natural history of hormone receptor-positive breast cancer. *Oncology (Williston Park)*, 2012 ;26: 688–94, 696
5. Bentzon N, Durning M, Rasmussen BB et al: Prognostic effect of estrogen receptor status across age in primary breast cancer. *Int J Cancer*, 2008; 122: 1089–94
6. Simmons C, Miller N, Geddie W et al: Does confirmatory tumor biopsy alter the management of breast cancer patients with distant metastases? *Ann Oncol*, 2009; 20: 1499–504
7. Niikura N, Odisio BC, Tokuda Y et al: Latest biopsy approach for suspected metastases in patients with breast cancer. *Nat Rev Clin Oncol*, 2013; 10: 711–19
8. Jo VY, Fletcher CD: WHO classification of soft tissue tumours: An update based on the 2013 (4th) edition. *Pathology*, 2014; 46: 95–104
9. Collini P, Sorensen PH, Patel S et al: Sarcomas with spindle cell morphology. *Semin Oncol*, 2009; 36: 324–37
10. Fisher C: Spindle cell sarcomas. *Surg Pathol Clin*, 2011; 4: 721–44
11. Feng L, Cai D, Muhetaer A et al: Spindle cell carcinoma: The general demographics, basic clinico-pathologic characteristics, treatment, outcome and prognostic factors. *Oncotarget*, 2017; 8: 43228–36
12. Feng L, Wang M, Yibulayin F et al: Spindle cell sarcoma: a SEER population-based analysis. *Sci Rep*, 2018; 8: 5024
13. Kirova Y, Vilcoq JR, Asselain B et al: [Radiation-induced sarcomas after breast cancer: Experience of Institute Curie and review of literature]. *Cancer Radiother*, 2006; 10: 83–90 [in French]
14. Meng XY, Wu SK, Song ST et al: Clinical manifestations and radiological features may contribute to the early diagnosis of radiation-induced sarcoma after breast cancer. *Clin Radiol*, 2014; 69: 1228–34
15. Sheth GR, Cranmer LD, Smith BD et al: Radiation-induced sarcoma of the breast: A systematic review. *Oncologist*, 2012; 17: 405–18

Conclusions

Sarcomas can develop *de-novo* or secondary to radiotherapy in breast cancer survivors and diagnosis can be challenging. To prevent misdiagnosis and unnecessary treatment, we recommend a tissue biopsy with an immunohistochemical profile when a mass suspicious for recurrence is found in patients with breast cancer.

Conflicts of interest

None.