Primary Breast Leiomyosarcoma with Metastases to the Lung in a Young Adult: Case Report and Literature Review

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Introduction
Primary breast sarcoma is an uncommon neoplasm with incidence of 0.5-1.0%. Breast leiomyosarcoma (LMS) is a rare subtype of breast sarcoma, constituting 5-10% of breast sarcomas [1], making it an extraordinarily rare malignancy. There are less than 70 documented cases in the literature, the majority of which are case reports, with the earliest appearing in 1968. Because of this rarity, the diagnosis and treatment have been historically nonuniform; however, more recent literature has described a more consistent approach. In this case report, we describe a primary breast LMS in a premenopausal adult female who despite mastectomy, developed metastatic disease in the lung.

Case Description
A 20-year-old female patient with a past medical history of neurofibromatosis type 1, presented with a three centimeter complex at the 6 o’clock position.

Discussion
Although sarcomas can occur anywhere in the body, less than 1% of all breast neoplasms consist of sarcomas [1-4]. LMS is a rare subtype of breast sarcoma. The diagnosis of breast LMS is generally post-menopausal [3-4]. Due to its rarity, in all age groups, there have been 68 documented cases in the literature, mostly isolated case reports—to our knowledge, ours is the first manuscript to detail all case reports of breast LMS (TABLE 1).

Clinically, breast LMS may be difficult to distinguish from other breast neoplasms especially since physical exam and imaging findings are often identical to other types of malignancy. Typically, at diagnosis, breast LMS may be several centimeters in diameter and well-circumscribed [3,5]. Mammogram, ultrasound, and other imaging modalities are also typically non-specific [5]. The masses are often mistaken for fibroadenomas, but more frequently mistaken for common breast malignancies, as there are no characteristic imaging features of these tumors.

Histologically, metastases to the lung require a positive result for core needle [6], or excision biopsy. Histopathologically, potential origin of the malignant cells include: blood vessel smooth muscle, smooth muscle of the nipple ductal epithelium, myofibroblasts, and transdifferentiation from benign neoplasms, such as leiomyoma or other spindle cell tumors [1,6].

Diagnostically, histological examination is the gold standard (FIGURE 2).

Treatment of stage I disease is surgical with lymph node dissection. For stage II disease, adjuvant radiation therapy is recommended after local excision [7].

Recent data support the hypothesis that the risk of nodal metastasis is significantly higher in patients with positive lymph nodes at the time of diagnosis. In the management of early-stage breast cancer, axillary lymph node dissection is recommended. In the treatment of patients with negative axillary lymph nodes, sentinel lymph node biopsy (SLNB) is recommended. The National Comprehensive Cancer Network recommends that all patients with node-negative breast cancer receive a SLNB followed by a completion axillary lymph node dissection if the sentinel node is positive.

In addition, adjuvant systemic therapy with chemotherapy and/or endocrine therapy may be considered for patients with hormone receptor-positive tumors and for patients with high-risk features. The treatment of patients with metastatic breast cancer is determined by the type and stage of the disease at diagnosis, the presence of metastatic disease, and the patient’s overall health and preferences. The initial treatment of metastatic breast cancer is usually a combination of chemotherapy and/or hormonal therapy, targeting specific molecular alterations. Targeted therapies, such as anti-HER2 therapy with trastuzumab, are used in patients with HR-positive, HER2-overexpressing tumors. Immunotherapy is an emerging treatment option for patients with metastatic breast cancer and is targeted against the programmed death-1 (PD-1) and programmed death-ligand 1 (PD-L1) pathways.

TABLE 1: Patients with primary breast leiomyosarcoma documented in the literature. "Mastectomy"

Conclusion
Physicians and surgeons treating breast leiomyosarcoma must be vigilant of potential lung metastases in order to optimize short- and long-term oncologic outcomes.

References