Breast Cancer Online, 2009, **12**(1), Page 1 of 4, ***e2***
doi:10.1017/S1470903109990150

ISSN 1470-9031

Case Study

Case Report: Phyllodes tumor of the breast with sarcomatous degeneration

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Abstract Phyllodes tumors of the breast are rare fibroepithelial neoplasms with variable malignant potential. Treatment is primarily surgical; the use of radiation therapy is controversial. Here, we present the case of a 29-year-old female with a histologically malignant phyllodes tumor of the breast initially treated with wide local excision. At 18 months following surgery the patient experienced a local recurrence, which displayed sarcomatous degeneration on pathological examination. The patient subsequently underwent a total mastectomy and adjuvant radiation therapy. We discuss the decision to employ radiation therapy in the management of the patient's tumor.

Keywords: Phyllodes tumor; Breast; Radiation

Introduction

Phyllodes tumors of the breast, comprising 0.3–0.9% of all breast tumors, are rare fibroepithelial neoplasms that display a broad range of clinical behavior [1,2]. Phyllodes tumors can manifest as benign lesions that behave similarly to fibroadenomas, or as frankly malignant lesions with the propensity to metastasize to distant sites. Histologically, phyllodes tumors can be classified as benign, borderline, or malignant, with benign tumors representing 54–85% of all cases [3]. However, tumor histology does not reliably predict clinical behavior, as histologically benign tumors have the potential to metastasize [4]. In addition, these tumors may transform if they recur over time, with more aggressive sarcomatous elements emerging. In this report, we provide a brief overview of the management of phyllodes tumors, describe the case of a patient with a recurrent, transforming malignant phyllodes tumor, and discuss the role of radiation therapy in the management of such a neoplasm.

The primary therapeutic strategy employed in the management of phyllodes tumors is surgery. While fibroadenomas can be treated with simple excision, phyllodes tumors require wide local excision, historically with a margin of at least 1 cm, because of their proclivity to recur if excised without sufficient margins [5]. In one retrospective review, the local recurrence rate for histologically malignant phyllodes tumors was 60% after local excision (margins less than 1 cm) and 28% after wide local excision (margins of at least 1 cm). The distant metastasis rate was 30% after local excision and 14% after wide local excision [6]. Mastectomy is only necessary for tumors that are large, relative to the size of the breast, and for persistently positive margins. Patients with histologically malignant phyllodes tumors are more likely to undergo mastectomy, but

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Received: 07/10/08
Accepted: 16/01/09
First published online 23/06/09
BCO/782/2008/CS

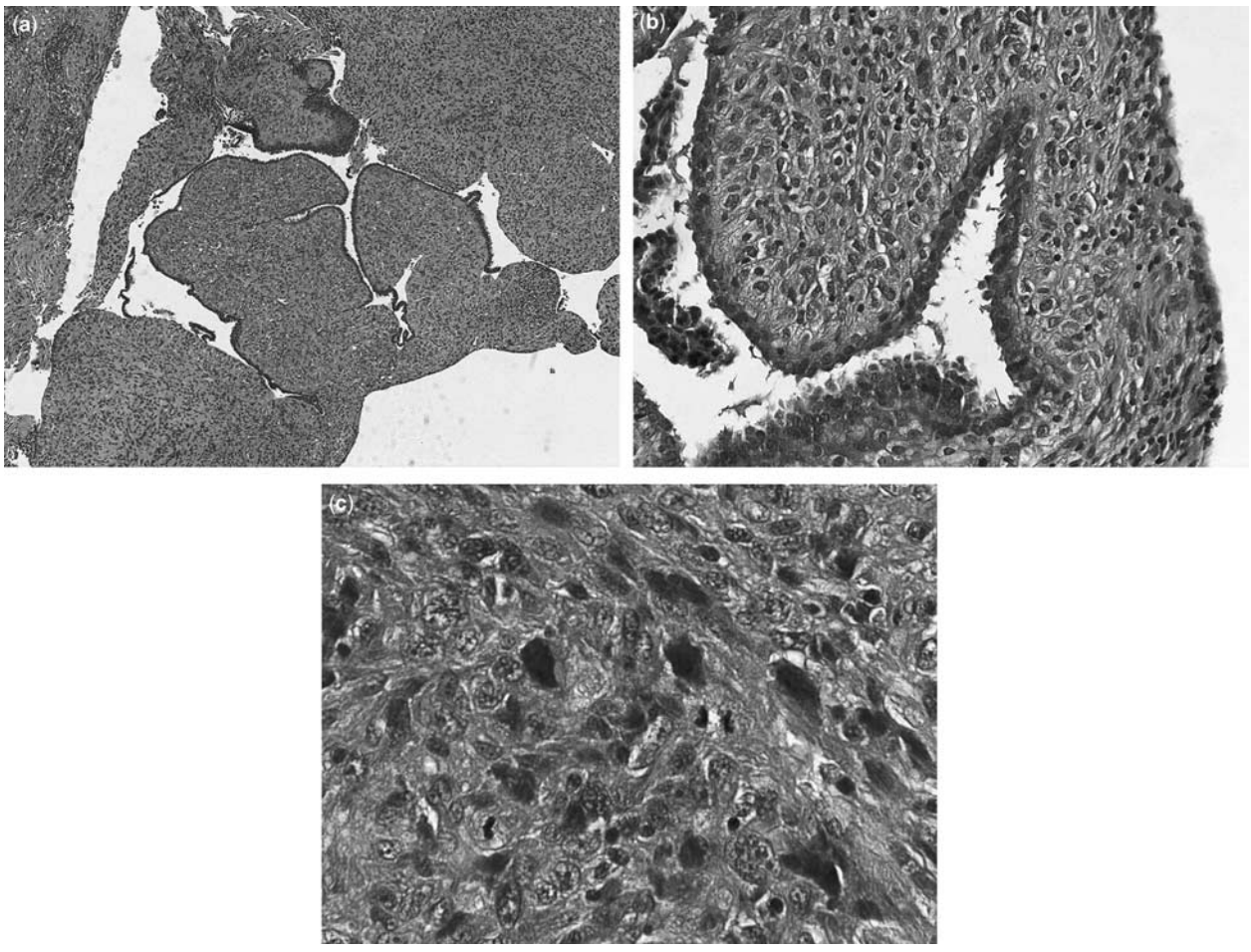

Figure 1.
Histologic examination of the original resection specimen at 40× (a) and 100× magnification (b) reveals a high grade, malignant phyllodes tumor. Epithelial and mesenchymal elements are seen and a leaf-like growth pattern is apparent. A 400× view (c) of the malignant mesenchymal component of the tumor reveals hypercellularity, nuclear pleomorphism and numerous mitotic figures. All specimens were stained with hematoxylin and eosin.

there is little literature to support such practice [7,8]. Axillary lymph node dissection is usually not indicated, as phyllodes tumors rarely involve the locoregional lymph nodes [9].

The benefit of adjuvant chemotherapy is largely unproven and should only be considered in patients with large, high-grade, malignant phyllodes tumors in light of the potential side effects of such treatment [10].

Adjuvant radiation therapy is controversial, but appears to be appropriate in certain cases, as discussed below. Here, we depict the clinical presentation, diagnosis, and treatment of a patient with a histologically malignant phyllodes tumor, and discuss the rationale behind our decision to employ radiation therapy in the management of her condition.

Case

A 29-year-old woman was seen at Memorial Sloan-Kettering Cancer Center for a phyllodes tumor of the right breast. She detected the mass in June of 2006, and promptly sought medical attention. At a subsequent visit with her breast surgeon, physical exam revealed a 2–3 cm mobile mass in the lower, outer quadrant of the right breast. Ultrasound detected a $2.9 \times 2.1 \times 3.1$ cm irregular mass with mixed echogenic features at the 9 o'clock axis of the right breast. Core needle biopsy revealed a malignant phyllodes tumor. Computed tomography of the chest, abdomen, and pelvis showed no evidence of metastatic disease.

The patient underwent a wide local excision of the tumor, with the gross margin clearance measuring at least 2 cm in all directions. The entire biopsy cavity was re-excised at the time of the wide local excision with 1 cm gross margins. Pathology revealed a high-grade malignant phyllodes tumor that measured 3.5 cm in greatest dimension (Fig. 1). Each 1-cm gross re-excision margin was free of disease. No adjuvant radiation therapy or chemotherapy was administered at the time.

https://doi.org/10.1017/S1470903109990150 Published online by Cambridge University Press

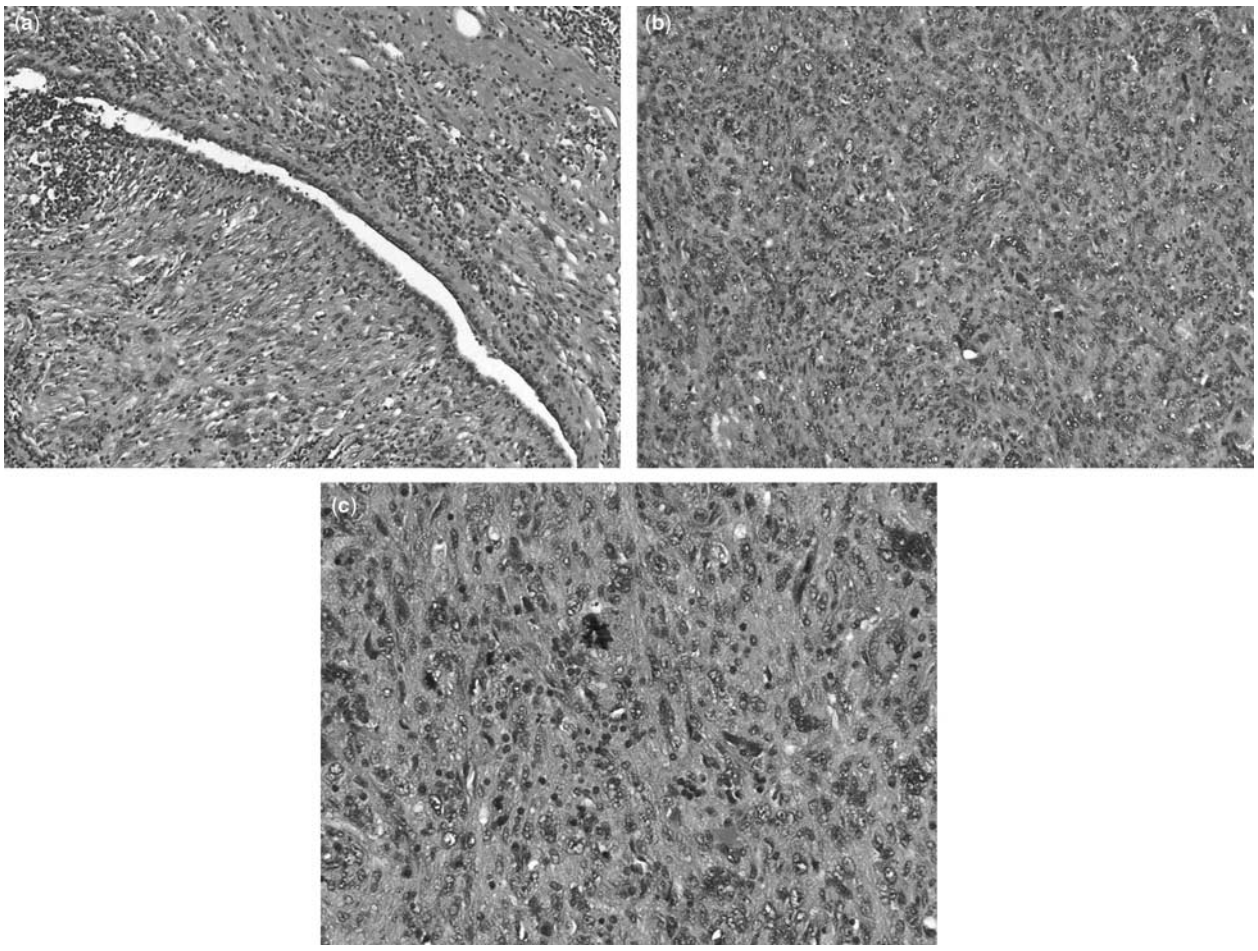

Figure 2.
Histologic examination of the recurrent lesion at 100× magnification (a) shows a malignant phyllodes tumor with marked stromal overgrowth and scarce epithelial elements. The mesenchymal component has the appearance of an undifferentiated, high-grade sarcoma. Diffuse sheets of malignant cells with high-grade, bizarre nuclei and numerous mitoses characterize the sarcomatous component, shown at 100× (b) and 200× (c). All specimens were stained with hematoxylin and eosin.

The patient remained without evidence of disease until January of 2008, when she developed a rapidly enlarging palpable mass in her right breast. She presented to her surgeon, who palpated an 8 cm mass in the lower, outer quadrant of the right breast that was closely adherent to the overlying skin but was without fixation to the chest wall. No lymphadenopathy could be appreciated. An ultrasound showed two solid lobulated masses, $5.4 \times 2.8 \times 4.9$ cm and $2.3 \times 1.0 \times 2.0$ cm, at the 9 o'clock axis of the right breast. A core biopsy was performed, revealing a malignant phyllodes tumor of histology similar to the patient's prior tumor. A computed tomography scan of the chest, abdomen, and pelvis showed two mildly enlarged right axillary lymph nodes, the larger measuring 1.1×0.7 cm, and stable subcentimeter pulmonary nodules.

In February 2008, the patient underwent a right total mastectomy with re-excision of the pectoralis major muscle directly posterior to the tumor mass. Pathology demonstrated a 7.0-cm malignant phyllodes tumor that now contained an undifferentiated, high-grade, pleomorphic sarcoma (Fig. 2). No involvement of the skin or nipple was noted. The posterior skeletal muscle margin that was re-excised at the time of surgery was free of disease. Eight level I lymph nodes were negative for metastatic disease. The patient received adjuvant radiation therapy in the form of 50 Gy to the chest wall. A radiation boost to the tumor site has been scheduled but the patient has not followed through to date. No radiation to the locoregional lymph nodes was administered.

Discussion

Radiation therapy (RT) in the management of phyllodes tumors is controversial. In one retrospective

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review of patients with borderline or malignant phyllodes tumors, the use of adjuvant radiation showed a statistically significant improvement in local recurrence rate (median follow-up was 106 months). This improvement was seen in both patients treated with wide local excision and mastectomy, although the benefit of RT in these individual subgroups was not statistically significant. Of note, there was no statistically significant improvement in disease-specific survival or overall survival in patients who received RT [11]. In contrast to the findings of this review, other smaller reviews have not shown a statistically significant benefit to RT [7,9]. If employed, the optimal dose and schedule of radiation therapy remains to be elucidated.

We chose to administer RT to this patient because she had recurrent disease of high-grade histology that featured sarcomatous degeneration. Each of these factors is thought to convey an increased risk for local or distant recurrence [6,12–14]. Aggressive treatment was warranted in order to improve the likelihood of disease-free survival in this patient, and the limited body of literature on the subject appears to support the use of radiation therapy in such a setting.

Because of its rarity, the management of phyllodes tumors is not well defined. Future studies examining the role of radiation therapy, as well as the dose and fractionation with which it is administered, are clearly warranted.

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