Perivascular epithelioid cell neoplasm of the uterine cervix: an unusual tumor in an unusual location

Michael J. Bradshaw,1 Andrew L. Folpe,2 Gary A Croghan1
1Mayo Medical School, 2Department of Laboratory Medicine and Pathology, Department of Medical Oncology, Mayo Clinic College of Medicine, Rochester, MN, USA

Abstract

A 46-year-old woman presented for a second opinion regarding a 3-4 cm mass of the uterine cervix. A prior biopsy had been interpreted as a malignant melanoma of the cervix, resulting in a radical hysterectomy with bilateral salpingo-oophorectomy. This was to be followed by external beam irradiation and immunotherapy; however, given the rarity of this diagnosis, the patient sought a second opinion at our institution. Further review of the pathological material from the hysterectomy revealed a morphologically benign perivascular epithelioid cell neoplasm rather than a malignant melanoma. Close monitoring of the patient was recommended; she is currently disease-free more than three years after her initial presentation.

Introduction

Perivascular epithelioid cell neoplasms (PEComas) comprise a group of unusual visceral, soft tissue, bone, and skin tumors defined by both their unique morphological features and their characteristic “myomelanocytic” immunophenotype. These tumors co-express markers of melanocytic differentiation, such as gp100 protein (recognized by mAb HMB45) and markers of myogenous differentiation, such as smooth muscle actin isoforms.1 Angiomyolipoma of the kidney represents the most common and “prototypical” PEComa, with much rarer tumors in different anatomical locations having been described under such names as lymphangioleiomyomatosis, clear cell “sugar” tumor, clear cell myomelanocytic tumor, and abdomenopelvic sarcoma of perivascular epithelioid cells, among others. The differential diagnosis of PEComas is broad and may include both benign tumors, such as leiomyoma or lipoma, as well as malignancies, including malignant melanoma, clear cell carcinoma, leiomyosarcoma, and liposarcoma. Here we present a case of PEComa of the uterine cervix that was initially diagnosed and treated as a malignant melanoma. The differential diagnosis of this very rare neoplasm and its classification and treatment are reviewed.

Case Report

A 46-year-old gravid-4, para-1 female presented to an outside provider in early 2007 for evaluation of intermittent vaginal bleeding, lasting for at least one year. The patient’s medical history was significant for miscarriages, endometriosis, borderline hypertension, a grade 1/6 intermittent heart murmur, and malaria contracted while working in the Philippines in her twenties. Her family history was significant for a brother with multiple myeloma and a sister with leiomyosarcoma.

On examination by the outside provider, the patient was found to have a friable 3-4 cm mass arising from the uterine cervix. A biopsy of this mass was performed and diagnosed as malignant melanoma. Preoperative computer tomography (CT) and positron emission tomography (PET)-CT fusion scans were negative for regional or distant metastatic disease. A hysterectomy with bilateral salpingo-oophorectomy and regional lymph node dissection was performed.

The pathological specimen from the hysterectomy revealed a 2.5×2.0×0.9 cm cervical mass, which was considered by the pathologists at the outside institution to represent malignant melanoma. Thirty-three lymph nodes were negative for metastatic disease. On the basis of these findings it was recommended that the patient receive immunotherapy and external beam radiotherapy, possibly with additional brachytherapy. Following these recommendations, the patient presented to our institution for a second opinion regarding treatment options. On further review, the hysterectomy specimen was felt to represent a PEComa, rather than a malignant melanoma. This was based on its nested growth pattern, clear to lightly acidophilic cytoplasm, relatively low-grade cytological features, absence of mitotic activity or necrosis (Figures 1 and 2), and myometrial immunohistochemistry (co-expression of melanocytic and myoid antigens). PEComas are rare with the most common member of this family, angiomyolipoma of the kidney, having an estimated prevalence of only 0.13% of the population.2 PEComas have been reported in a wide variety of visceral, intra-abdominal, soft tissue, and bone locations, and occur with some frequency in the gynecological tract, including the uterine cervix and corpus.3 PEComas of all types most often occur in middle-aged women (median age, 38 years), being seven times more common in women overall and four times more common even when gynecological sites of origin are excluded.3 PEComas of all types have been associated with the tuberous sclerosis complex (TSC) and with inactivating mutations in the TSC-associated genes TSC1 or TSC2, although this association is much stronger for angiomyolipoma and lymphangioleiomyomatosis than it is for gynecological and soft tissue PEComas.4

The diagnosis of PEComa may be very challenging, owing to its rarity and its morphological and immunophenotypical overlap with other tumors, both benign and malignant. As emphasized by our case, PEComas may closely simulate malignant melanomas, particularly in the setting of limited biopsies. Important clues to the correct diagnosis of PEComa include lower nuclear grade as com-
pared with melanomas (without the prominent macronucleoli characteristic of melanomas), nested growth with a prominent associated capillary vasculature, and clear to lightly eosinophilic cytoplasm. Ultimately, however, immunohistochemistry is critical in the distinction between PEComa and melanoma. Although both tumor types express melanocytic markers, such as gp100 protein, Melan A, tyrosinase, and microphthalmia transcription factor, PEComas are typically negative for S100 protein, expressed in 98% or more of melanomas, and are positive for smooth muscle actin isoforms not expressed in melanomas.1,9,10

The behavior of PEComas remains to be fully elucidated, owing to their rarity. However, a histopathological classification scheme has been elaborated by Folpe and colleagues,11 stratifying PEComas into “benign”, “of uncertain malignant potential”, and “malignant”. The present case was considered to be morphologically benign, based on its small size (<5 cm), intermediate nuclear grade, intermediate cellularity, low mitotic rate (≤1/50 MPF/HPF), and absent necrosis. Follow-up to date on PEComas classified as morphologically benign has shown them to be clinically benign as well.

In the unlikely event of a recurrence of this patient’s cancer, treatment options would include surgical resection, if feasible. The role of radiation therapy is presently unknown. Standard chemotherapy for sarcomas was not effective in a recent case report.12 Another report suggests that PEComas may respond to inhibition of the mTOR signaling pathway using sirolimus or temsirolimus.13 Owing to the rarity of these tumors and their mixed histological features, effective treatments are still being developed for malignant PEComas.

References