

Uterine cervical melanoma presenting with rapid progression detected by PET/CT

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Abstract

Malignant melanoma of the uterine cervix is a rare extracutaneous melanoma which develops aggressively and is associated with a bleak prognosis. To our knowledge, no prior published reports have discussed the role of 18F-FDG positron emission tomography/computed tomography (PET/CT) in managing this disease. Our case study involved a 66-year-old woman with a malignant melanoma of the uterine cervix. The patient received PET/CT that identified metastases and lesions which had not been detected from her MRI. Serial PET/CT elucidated that the disease was initially limited to the pelvis, but then metastasized to the abdominal para-aortic lymph nodes, followed by extensive metastases to the brain, lungs, breast, supraclavicular, neck, and other abdominal lymph nodes, as observed at 6-month follow-up. PET/CT was used to complement conventional anatomic imaging modalities, and provided a novel modality for whole body screening. Visualization of the metabolic activity of indeterminate lesions may help in staging, re-staging, treatment planning, and prognostic prediction for patients with this rare disease.

Keywords: Melanoma, uterine cervix, PET/CT

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Primary malignant melanoma of the uterine cervix is an extremely rare disease with approximately 78 cases having been described in the literature (1–5). The prognosis is poor and detection of this aggressive disease is usually untimely due to its rarity and lack of suspicion on the part of clinicians as well as the tumor's occult anatomic location (6). In addition, conventional imaging modalities have shown a disappointed inability to detect the spread of the disease due to their limited field of view and related less diagnostic accuracy (7). We recently saw a patient harboring a primary uterine cervical melanoma, the spread of which was detected early with 18F-FDG positron emission tomography/computed tomography (PET/CT).

Case report

The patient was a 66-year-old woman who had been menopausal for 13 years, complaining of recent vaginal bleeding. Gynecologic examination found a small cervical polyp. The polypoid tumor was excised, measuring 1.7 × 1.7 × 1.5 cm

in size. Microscopic examination revealed sheets or solid nests of epithelioid tumor cells with pleomorphic nuclei and scattered mitotic figures. The tumor cells were diffusely positive in staining for vimentin and S-100 protein. Some of the cells were also positive for HMB-45 (Fig. 1). A diagnosis of malignant melanoma was made. Initial staging with magnetic resonance imaging (MRI) showed a vaginal tumor and an enlarged lymph node in the right part of the pelvis (Fig. 2a). Whole-body PET/CT was then performed, and revealed metabolic active lesions in the areas corresponding to those seen on the MRI (Fig. 2b). The patient thus received radical hysterectomy, a total vaginectomy, and pelvic lymphadenectomy. The final diagnosis was malignant melanoma of the uterine cervix with metastases to pelvic lymph nodes and vagina. Two months after the operation, without any further treatment, PET/CT identified a recurrence of metabolic active lesions in one of the abdominal para-aortic lymph node (Fig. 3a). Debulking surgery to remove the lymph node was performed and the lesion was proven to be metastatic. The patient then received radiotherapy targeting the para-aortic region.

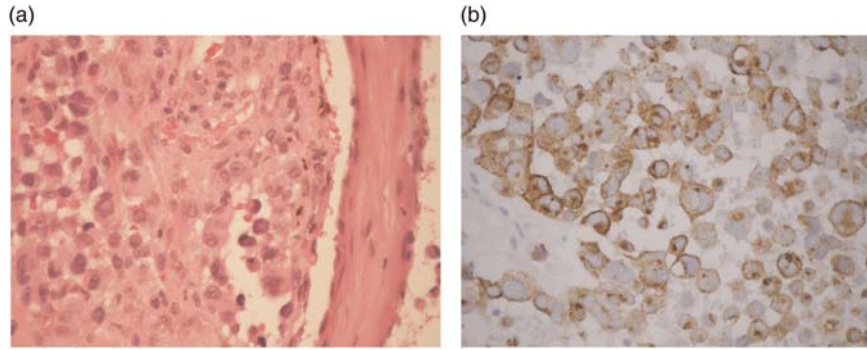


Fig. 1 Excision biopsy of the cervical polyp showed sheets or solid nests of epithelioid tumor cells with pleomorphic nuclei and scattered mitotic figures. (a) The tumor cells spread along the basal layer of the squamous epithelium focally (H&E, $\times 400$); (b) Some tumor cells were also positive for HMB45 (HMB45, $\times 400$)

Three months after completion of radiotherapy, a pelvic MRI examination was negative. However, whole-body PET/CT demonstrated unsuspected multiple metastases that extensively involved the brain, right breast, both lungs, and lymph nodes of the right side of the neck, supraclavicular region, and abdominal cavity (Fig. 3b). Histological analysis found the massive tumor in her right breast to be a metastatic melanoma. The patient refused further management except for palliative radiotherapy targeting the brain.

Discussion

The most widely used imaging modalities for cancer staging and re-staging are CT, MRI, and PET/CT. MRI may assist in distinguishing cervical melanoma from other tumors, based on a distinct signal pattern on T1- and T2-weighted images. Malignant melanoma with rich melanocytes is expected to appear hyperintense on T1-weighted images (7). However, mucosal melanomas may be amelanotic, and a definite diagnosis must be confirmed by immunohistochemical staining for S-100 protein, HMB-45, and vimentin and by

excluding any other primary melanoma site. Because the clinical presentation and spread pattern of uterine melanoma resemble that of cervical carcinoma, the FIGO staging system has been generally accepted (1). Sentinel lymph nodes sampling is a reliable method to predict the metastatic status of the regional lymphatic basin in patients with cutaneous melanoma and cervical cancers (8, 9). Prior research has investigated the diagnostic accuracy of MRI, CT and PET for identifying lymph node status in primary cervical cancer. The results demonstrated that PET was superior to MRI and CT for sensitivity, specificity, and accuracy in detecting pelvic nodal metastasis (10, 11). The role of PET for staging and re-staging cutaneous malignant melanoma has been reported to have high sensitivity and accuracy, and was most valuable for patients in clinical stage IIC and higher (12, 13). However, no reports have been published about the role of PET or PET/CT in the clinical management of malignant melanomas arising from female reproductive organs. In the current case study at the initial staging work-up, PET/CT provided whole body information that the disease was limited to the patient’s pelvis, thus confirming the diagnosis of primary cervical melanoma. One of the proposed criteria to diagnose primary

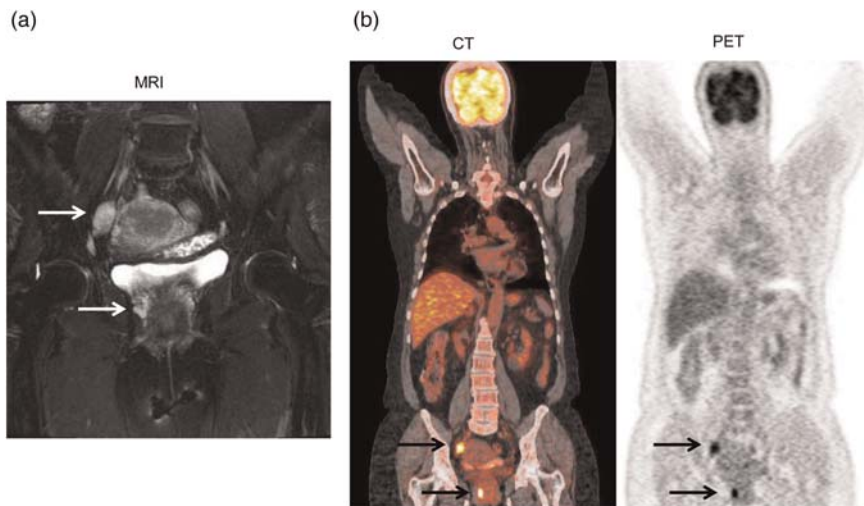


Fig. 2 After excision of the uterine cervical tumor, (a) MRI and (b) PET/CT for initial staging demonstrated two focal lesions with intense FDG uptake in the right pelvic lymph node and vagina (arrows show the lesions). The pattern was consistent with metastases. No abnormal uptake was noted elsewhere

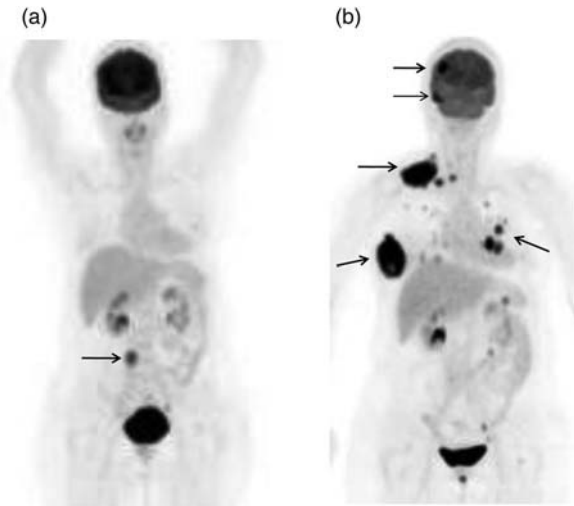


Fig. 3 (a) Follow-up PET/CT 2 months after surgery demonstrated focal increased activity in the abdominal para-aortic lymph node (arrow); (b) Three months later, multiple metastases was observed in the brain, neck and right supraclavicular region, right breast, bilateral lungs (multiple nodules), and abdomen (nodules). Arrows indicate the lesions

melanomas of the uterine cervix is absence of primary lesion elsewhere, especially in the skin, ocular, or other mucosal sites. During our patient's follow-up period, PET/CT confirmed a metastatic pelvic lymph node identified by MRI. In addition, rapid progression in this patient was early detected by whole body PET/CT surveillance.

In conclusion, PET/CT is a sensitive method for detecting early spread of this aggressive disease.

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