INTRODUCTION

With the exception of the ovaries, metastases to the female genital tract from extragenital cancers are uncommon (1, 2). Uterine metastases are very rare and comprise less than 10% of metastases to the female genital tract (3). Extragenital cancers that can metastasize to the female genital tract include cancers of the breast, gastrointestinal tract, ovary, skin and kidney (1-3). Although a few pathologic series (1, 3-7) describe metastases to the uterus, to our knowledge, the description of the imaging is limited to only a few studies and a case report in English literature (2). We report and describe the imaging features of endometrial metastasis from colonic adenocarcinoma.

CASE REPORT

A 40-year-old woman with recurred colon cancer was followed. The patient was first admitted in November 2010 because of melena and intermittent abdominal pain. Initially, imaging did not demonstrate any evidence of metastasis. She underwent a laparoscopic right hemicolectomy for transverse colon cancer, which proved to be a stage pT3N1M0 moderately differentiated adenocarcinoma. She received twelve cycles of adjuvant chemotherapy using the FOLFOX regimen (5-fluorouracil, leucovorin and oxaliplatin). Follow-up studies were negative for recurrence or metastasis until July 2011.

Contrast-enhanced abdomen and pelvis CT and whole-body positron emission tomography-CT (PET-CT) scans in February 2012 revealed multiple hepatic metastases. Whole-body PET-CT scan also showed a hypermetabolic lesion in the uterus [maximal standardized uptake value (max-SUV): 13.2]; however, the uterine lesion was thought to result from a menstrual physiologic uptake rather than a true lesion (Fig. 1). The patient subsequently received twelve cycles of chemotherapy using the FOLFIRI regimen (5-fluorouracil, leucovorin and irinotecan) and after a one-month interval, a follow-up CT revealed stable disease.
In October 2012, another contrast-enhanced abdomen and pelvis CT scan showed an increased in the size and number of hepatic metastases. Once again, it demonstrated a heterogeneously enhancing, predominantly endometrial lesion in the uterus (Fig. 2). Lymph node enlargement was also noted in the left external iliac area. A whole-body PET-CT scan showed newly developed hypermetabolic metastatic lesions in both lungs, multiple bones, lymph nodes (paraaortic and left pelvic lymph nodes) and peritoneum as well as hepatic metastases (Fig. 3A). The hypermetabolic lesion in the uterus was increased in size (Fig. 3B), compared to the previous PET-CT scan; therefore, the possibility of malignancy was considered.

The patient was premenopausal. She denied gynecologic symptoms, such as vaginal bleeding or change in menstruation. There was no pelvic pain. Laboratory tests, including complete blood count, electrolytes and liver function tests, were all within normal range. To identify the endometrial lesion, an endovaginal ultrasonography (US) was performed. The US (IU 22, Philips Medical Systems, Bothell, WA, USA) equipped with an endviewing endovaginal 8-MHz transducer, identified a 4.0 × 1.4 cm, smoothly lobulated heterogeneous uterine mass, which was predominantly located in the endometrium. The mass was extended from the uterine fundus to the endocervical canal (Fig. 4A). On Doppler US, increased vascular flow within the mass was evident (Fig. 4B).

Endometrial curettage was also performed. Histopathology results indicated that the uterine lesion was metastatic from colonic adenocarcinoma, identified from the previous hemicolectomy specimen. Immunohistochemical profiling also confirmed the presence of colonic adenocarcinoma (Fig. 5). Therefore, the findings established the diagnosis of uterine metastasis from colonic adenocarcinoma predominantly in the endometrium.

Two cycles of chemotherapy using a palliative third-line regimen (bevacizumab and capecitabine) were administrated. A follow-up contrast-enhanced abdomen and pelvis CT scan revealed that the uterine and hepatic lesions as well as lymphadenopathies regressed with a partial response.

**DISCUSSION**

The most common mode of secondary tumor involvement of the uterus is through a contiguous spread or direct extension,
most often from a colorectal or bladder tumor (2). On the other hand, noncontiguous spread, such as metastasis to the uterus, is an infrequent clinical event (1-3). Although the reason for the rarity of this occurrence remains unclear, several possible causes have been postulated, including the centrifugal drainage of lymphatics from the uterus, the fibrous nature of cervical stroma and underestimation of the incidence of such metastasis due to the lack of routine microscopic examination of the uterus at autopsy (2, 6). The diagnosis of a direct tumor extension is often easily made because of a direct visualization of the adjacent invading tumor on imaging. However, metastasis to the uterus poses a more diagnostic challenge; imaging features include a diffuse, heterogeneously enhancing infiltrative process with preservation of the normal uterine shape (2). On T2-weighted MR imaging, uterine involvement displayed a partial or total loss of the hypointense signal in the cervical stroma or myometrial junctional zone, depending on the location of involvement; uterine involvement showed heterogeneous enhancement on contrast-enhanced MR images (2).

To the best of our knowledge, this is the first case describing the sonographic features of the uterine metastasis in the English literature. In this case, a smoothly lobulated heterogeneous uterine mass, which was predominantly located in the endometrium with extension into the endocervical canal, was noted on US with preservation of the uterine shape. The image showed a polypoid mass rather than that of an infiltrative nature. Thus, primary endometrial polyp, hyperplasia or malignancy may be the first choice. Considering the increased size of uterine lesions and other metastatic lesions at the follow-up, the metastasis should be differentiated.

Metastasis to the uterus occurs; however, the myometrium is generally thought to be more commonly involved rather than the endometrium (3). Furthermore, metastases to the endometrium of the uterus from colon adenocarcinoma are extremely rare (1, 8). Mazur et al. (1) reported that the endometrium was the metastatic site for colon and rectum carcinoma in only 3.6% of the 56 cases in their study.

US is the preferred initial diagnostic modality for gynecologic disease and captures the real-time images of organs and blood flow without radiation hazards (9). Additionally, US is almost always the first modality used in the radiologic work-up of endometrial diseases. The next steps often include sonohysterogra-
Imaging Findings of Endometrial Metastasis from Colon Cancer

phy and MR imaging to correlate with the US findings. If a PET-CT scan is performed, an increased activity in the endometrium during the ovulatory and menstrual phases is often expected (10). As in this case, endometrial pathology needs to be differentiated from the normal prominent endometrium on the CT and PET-CT scan. Using US, a smoothly lobulated heterogeneous, predominantly endometrial uterine mass was detected and true endometrial pathology was favored. US may be the best modality to analyze the endometrium and to guide further diagnostic work-up in these patients, such as endometrial biopsy.

Clinically, the most common presenting symptom of uterine metastasis is vaginal bleeding. The clinical symptoms may precede the diagnosis of the primary tumor in up to 25% of these cases (2, 3). In one series, 27% of uterine metastases clinically presented as possible primary gynecologic lesions (2, 4). In general, abnormal vaginal bleeding is often a presenting symptom of pelvic malignancy, and it estimated that 10-20% of patients with vaginal bleeding have primary endometrial carcinoma (9). Contrary to other reported cases of endometrial malignancy including metastasis, the patient in this case was asymptomatic. US may still be a useful modality for evaluating endometrial diseases in asymptomatic patients.

In summary, we report a rare case of predominantly endometrial metastasis in the uterus from colonic adenocarcinoma. The lesion was depicted on US, CT and PET-CT as a smoothly lobulated, heterogeneous and hypermetabolic mass with increased vascular flow and enhancement. In patients with other primary malignancies, the endometrial metastasis should be included in a differential diagnosis when evaluating the endometrial mass as well as endometrial polyp, endometrial hyperplasia or primary endometrial malignancy.

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결장암에서 자궁 내막 전이의 영상 소견: 증례 보고

김나라1·박성빈1·이종범1·박현정1·김미경2·황인규3·석주원1

자궁 전이는 아주 드물게 발생하며 자궁 전이의 영상 소견은 영문 문헌상으로 보고된 적이 거의 없다. 이에 저자들은 결장 암 환자의 자궁 내막 전이 증례의 영상 소견을 보고하고자 한다.

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