**CLINICAL IMAGE**

**MR Imaging of Polypoid Endometriosis of the Ovary**

Eito Kozawa1*, Kaiji Inoue2, Noriaki Iwasa3, Keiichi Fujiwara3, Masanori Yasuda4, Junji Tanaka2, and Fumiko Kimura1

Departments of 1Imaging Diagnosis, 3Gynecologic Oncology, and 4Pathology, Saitama Medical University, International Medical Center

1397-1, Yamane, Hidaka-shi, Saitama 350–1298, Japan

2Department of Radiology, Saitama Medical University

(Received August 30, 2011; Accepted February 9, 2012)

We report a case of polypoid endometriosis of the ovary and correlate magnetic resonance (MR) and pathological findings. The endometriosis appeared as multiple polypoid areas along the wall of the ovarian cystic lesion with hyperintensity on T2-weighted images and slight hyperintensity on diffusion-weighted images. However, the polypoid areas did not yield low apparent diffusion coefficient (ADC) values on ADC map images. These MR findings were similar to the signal intensity of the uterine endometrium, reflecting the presence of abundant endometrial glands.

Keywords: diffusion-weighted image, MRI, ovary, polypoid endometriosis, T2-weighted image

**Introduction**

Endometrioma is relatively common in women of reproductive age and is associated with cancer risk.1–4 The presence of a solid component on magnetic resonance (MR) imaging distinguishes endometrioma from endometrioma associated with malignant tumor.1–4 We describe a case of polypoid endometriosis of the ovary and discuss the key for differential diagnosis.

**Case Report**

We evaluated a 36-year-old woman, gravida 1 para 1, who presented with lower abdominal pain. She had no history of taking medications that may have influenced hormonal factors. Biochemistry revealed elevated serum cancer antigen (CA) 125 of 323 U/mL (normal < 26 U/mL) and carcinoembryonic antigen (CEA) of 5.8 ng/mL (normal < 5.0 ng/mL). Sonography showed a large mass with solid components in the pelvis. Pelvic MR imaging showed a cystic mass with homogeneous hyperintense appearance on both T1- and T2-weighted images. Solid areas in the cystic mass showed hypointense signal intensity on T1-weighted image and strong hyperintensity with hypointense rim and linear areas on T2-weighted image (Fig. 1A-C, E). The solid lesions demonstrated slight hyperintensity compared with muscles on diffusion-weighted image and did not yield a low apparent diffusion coefficient (ADC) value on an ADC map image (Fig. 1C, D). Gadolinium-enhanced T1-weighted image revealed a homogeneous hyperintense area (Fig. 1F). The preoperative diagnosis was endometrioma with related malignant tumor, such as clear cell carcinoma, endometrioid adenocarcinoma, or Müllerian mucinous borderline tumor.

Right adnexectomy revealed a cystic tumor of the right ovary that contained dark red fluid and solid components. The tumor's internal surface was irregular (Fig. 2A). Microscopic examination showed polypoid endometriosis of the ovary. The solid components showed many dilated endometrial glands with various amounts of endometrial stroma containing fibrous tissues, and the appearance was typical of polypoid endometriosis (Fig. 2B). Neither the glands nor stromal cells had cellular atypia.

**Discussion**

In the 1980s, Mostoufi-Zadeh and Scully used the term polypoid endometriosis to describe various forms of endometriosis.5 Parker and associates...
Fig. 1. (A) Axial T2-weighted image shows a hyperintense mass (arrow) with areas of strong hyperintensity with hypointense rim and linear areas (arrowheads). (B) Axial T1-weighted image shows a slightly hyperintense mass with areas of hypointensity (arrow) and with hypointense septum. (C) Diffusion-weighted image shows hyperintense mass (arrow) with areas of slight hyperintensity (arrowheads) compared with muscles. (D) Apparent diffusion coefficient (ADC) map image does not yield low ADC value in the polypoid areas. (arrowheads, ADC value = 1.69 × 10^{-3} mm²/s). (E) Sagittal T2-weighted image shows a hyperintense mass (arrow) with areas of strong hyperintensity and hypointense rim (arrowheads) located superior to the uterus. (F) Fat-saturated T1-weighted sagittal image with gadolinium shows solid component of homogeneous enhancement (arrowhead) within the cystic mass (arrow).
Fig. 2. (A) Macroscopically, the mass measured 14 cm × 10 cm × 12 cm. The resected mass looked whitish with punctuate dark red lesions. (B) Histologically, the solid mass consisted of many dilated endometrial glands (arrow) with various amounts of endometrial stroma.

reported the ovary as the third most common location of polypoid endometriosis, comprising about 20% of cases, with the rectum as the most common and sigmoid colon as the second most common location of this disease. Furthermore, although endometriosis is common in reproductive women, polypoid endometriosis is often seen in postmenopausal women, usually in association with exogenous hormone therapy or similar condition. However, our patient was still of reproductive age and had no history of taking medication that may have affected hormonal factors.

Polypoid endometriosis is rare, with only a few cases reported with MR findings in the English literature. Each of these cases consisted of a mass with cystic component containing polypoidal areas that were hyperintense on T2-weighted image and demonstrated homogeneous enhancement on contrast study, as in our case. Furthermore, Takeuchi and associates described linear areas of hypointensity contained in the polypoid areas of polypoid endometriosis adjacent to the uterus and rectum on T2-weighted image, findings compatible with the site of fibrous tissue. In the present case, as in that of Takeuchi’s group, T2-weighted image revealed the cystic mass with solid component of hyperintense signal with hypointense rim and linear areas (Fig. 1A). The presence of surrounding fibrous tissue showing hypointense rim on T2-weighted image may be a clue for differentiating endometrioma and endometrioma associated with malignant tumor.

Endometrioma has been reported to develop into malignant tumor in about 0.7 to 0.8% of cases. An established radiologic finding of endometrioma associated with malignant tumor is a cystic component with mass formation that shows gadolinium enhancement. In our case, solid components in the cystic mass demonstrated hyperintense signal intensity on T2-weighted image and intermediate signal intensity on enhancement study. The radiologic appearance of endometrioma associated with malignant tumor is solid components in the cystic lesion on enhanced MR imaging, and the appearance may be confused with that of polypoid endometriosis of the ovary.

The most common histological pattern in polypoid endometriosis is simple hyperplasia of the endometriotic glands and stroma. In many cases, various amounts of fibrous core were observed. In the present case, the solid component of the mass consisted of abundant endometrial glands; accordingly, the solid component showed strong hyperintensity on T2-weighted image. In our study, the solid component of the polypoid endometriosis demonstrated slightly hyperintense signal intensity on diffusion-weighted image that resembled the signal intensity in MR findings of endometrioma with associated malignant tumor. However, an ADC map image of the solid component of the polypoid endometriosis of the ovary did not yield a low ADC value in the same way as those of malignant ovarian tumors. The rich extracellular component of endometrial tissue resulting from dilated endometrial glands may give a relatively high ADC value on an ADC map image, whereas the hypercellularity of the solid component of endometrioma associated with a malignant tumor may limit water motion to give a relatively low ADC value. An ectopic endometrial gland may cause the hyperintense signal intensity of the solid component of polypoid endometriosis on diffusion-weighted imaging.

To our knowledge, there are no reports of the MR imaging findings of polypoid endometriosis of the ovary that include diffusion-weighted images. In our case, the solid component of the polypoid
endometriosis showed hyperintense signal intensity on diffusion-weighted image and did not yield low ADC value on ADC map image. These MR signals resembled that of the endometrial gland.

In conclusion, we report a case of polypoid endometriosis of the ovary that presented as a large cystic tumor with solid components. Close attention to the solid component of the endometrioma in patients with prominent hyperintense solid components on T2-weighted, diffusion-weighted, and ADC map images may lead to increased correct diagnoses of polypoid endometriosis of the ovary. Though polypoid endometriosis of the ovary is rare, it is very important that radiologists be aware of the condition and familiar with its imaging findings to facilitate accurate diagnosis and appropriate treatment.

References