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Case Report

A case of ovarian endometrioid carcinoma: Atypical MR imaging[☆]

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ABSTRACT

Endometrioid carcinoma is the second most common ovarian tumor, classified as an epithelial-stromal ovarian tumor, and is usually characterized by a cystic tumor with partial solid components on magnetic resonance (MR) images. In this case report, we discuss an 81-year-old female who presented with atypical genital bleeding and distended abdomen, for which she underwent abdominal computed tomography and MR imaging. Solid endometrioid carcinoma of the ovary is very rare but was confirmed in our patient during the histological examination after surgery.

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Introduction

Ovarian endometrioid carcinoma is a malignant epithelial tumor of the ovary that histologically resembles the common variant of endometrioid carcinoma of the uterine corpus [1]. Similar to most ovarian carcinomas, ovarian endometrioid carcinoma has several histological variants, which comprise portions of endometrioid carcinoma and other tissue-like components [2].

In most cases, they are easily diagnosed as malignant ovarian tumors on magnetic resonance (MR) imaging studies because of their characteristic cystic and solid components. Al-

though typical MR imaging findings of endometrioid carcinomas are well known to radiologists, some cases can be misleading. This article presents the MR imaging findings of an atypical ovarian endometrioid carcinoma, the so-called endometrioid carcinomas resembling sex cord-stromal tumors, through a clinical case.

Case report

We present the case of an 81-year-old female who presented with atypical genital bleeding. A plain CT examination

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Fig. 1 – Plain computed tomography examination revealed that a 5 cm-diameter smooth marginal mass with an equal density compared to the muscle was present in the left adnexa region.

revealed a well-contoured mass with a diameter of approximately 50 mm in the left adnexal region. The mass had an isodensity similar to the uterine muscle (Fig. 1). The MR imaging findings of the tumor are shown in Figure 2. On the sagittal T2-weighted images, the mass showed low intensity superior to the bladder (Fig. 2A). The thickness of the cervical endometrium was 9 mm, and the junctional zone was clear on the sagittal T2-weighted image (Fig. 2B). The entire mass in the left adnexal region had a high intensity in the early phase of the fat-saturated contrast axial T1-weighted image, and the contrast enhancement continued until the delayed phase. Therefore, it was considered a solid tumor. The solid component showed slight hypointensity on the T2-weighted images, which was comparable to that of the uterine outer myometrium, and had lower signal intensity than the solid components of an ordinary ovarian carcinoma. A rapid enhancement pattern was also observed. Based on these findings, a hormone-producing ovarian tumor was suspected. The pre-operative diagnosis was a thecomfibroma/thecoma. The differential diagnosis was adult granulosa cell tumors. However, no tumor was found in the uterus or the right ovary. The serum estradiol level of the patient before surgery was 80 pg/mL.

Based on a rapid intraoperative diagnosis as an adult granulosa cell tumor, simple total hysterectomy, bilateral adnexectomy, and partial omental resection were performed. However, pathological diagnosis from permanent sections revealed endometrioid carcinomas resembling a sex cord-stromal tumor such as Sertoli cell tumors, a variant of ovarian endometrioid carcinomas (Fig. 3). Two weeks after the operation, the patient's serum estradiol levels became lower than 8 pg/mL.

Discussion

Endometrioid carcinoma is the second most common ovarian tumor, is classified as epithelial-stromal, accounts for

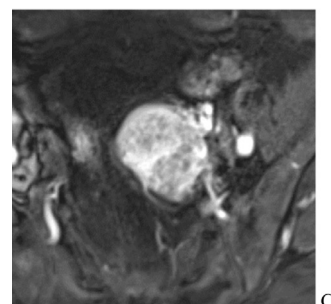
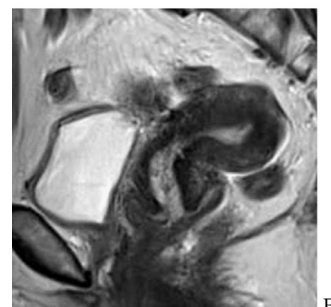
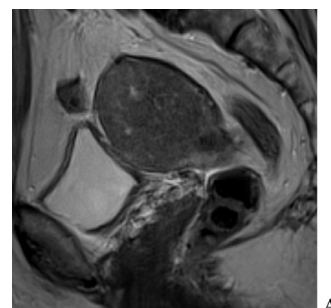


Fig. 2 – Magnetic resonance imaging (MRI). (A) On the T2-weighted sagittal image, the mass exhibited a whole solid appearance in the left adnexal region and was iso to low signal intensity compared to the outer myometrium. (B) On the T2-weighted sagittal image, the cervical endometrium of the uterus exhibited thickening. (C) On the early-phase (after 30 seconds) contrast-enhanced fat-saturated T1-weighted axial image, the tumor exhibited strong enhancement. (D) On the delay-phase (after 120 seconds) contrast-enhanced fat-saturated T1-weighted axial image, and the tumor maintained its enhanced appearance.

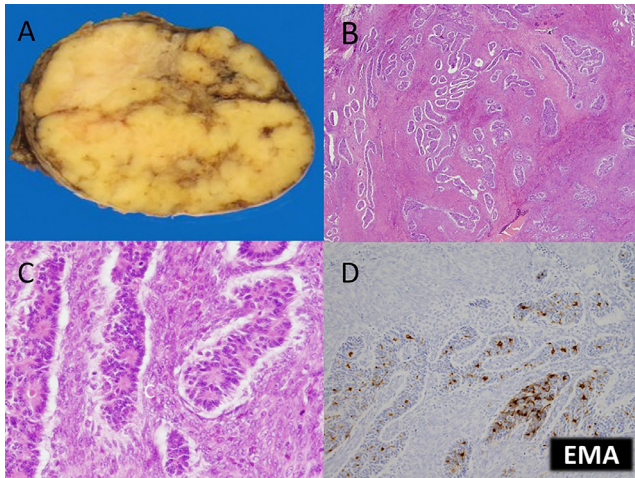


Fig. 3 – Pathological findings: macroscopic finding (A), microscopic findings (B: low-powered, C: high-powered), and immunostaining (D: EMA, epithelial membrane antigen). (A) yellow-tanned solid mass measuring 50 × 46 mm, with hemorrhagic change and no obvious cystic component. (B) Solid nests were observed to be scattered with the abundant stroma, and hemorrhage areas were surrounded by the abundant stroma. (C) The nests were arranged in a tubular manner, showing the appearance of a sex cord-stromal tumor such as the Sertoli cell tumor. Abundant stroma was composed of cells with plump large round nuclei and eosinophilic cytoplasm, characterized by functioning stroma. (D) The carcinoma cells were positive for EMA, but the stroma did not exhibit a positive reaction.

approximately 15%-20% of ovarian carcinomas, and occurs most frequently in women in the fifth and sixth decades of life [1,3,4]. Similar to most ovarian carcinomas, ovarian endometrioid carcinoma has several histological variants and can comprise portions of endometrioid carcinoma and other tissue-like components such as sex cord-stromal tumors [2]. In 1982, Young et al. [5] and Roth et al. [6] separately described variations in endometrioid carcinoma that histologically resembled sex cord-stromal tumors, and these postmenopausal women were observed to have high estrogen levels. This ovarian tumor is described as an endometrioid carcinoma resembling a sex cord-stromal tumor [1]. In particular, a limited number of studies report that these tumors constitute approximately 10% of ovarian endometrioid carcinomas and occur most commonly in women in the sixth and seventh decades of life [2,7].

Macroscopically, several pathological studies of endometrioid carcinoma resembling sex-cord stromal tumor have reported a large and prominent solid tumor with cystic necrosis and hemorrhage [1,2]. These findings rarely show major part microcystic components and a focally solid part. Microscopically, ovarian tumors show an admixture of conventional endometrioid carcinoma and components resembling sex cord-stromal tumors, but the ratio of components that resemble sex cord-stromal tumors varies. The histological findings appear similar to sex cord-stromal tumors such as Sertoli cell

tumors, Sertoli-Leydig cell tumors, or granulosa cell tumors [5,6,7]. In the present case, macroscopic findings showed a tumor with only solid components in Figure 3A and microscopic findings showed finding similar to that of Sertoli cell tumor in Figures 3B and 3C.

To the best of our knowledge, the MR imaging findings of ovarian endometrioid carcinomas resembling sex cord-stromal tumors have not yet been investigated. The MR imaging findings of the current case showed large and whole solid tumors, such as those in macro pathological findings; nevertheless, the typical findings in ovarian endometrioid carcinomas generally show a complex cystic mass with papillary solid components of high signal intensity on T2-weighted images [8,9]. Furthermore, findings on T2-weighted images showed a wider endometrium and clear junctional zone uterus, despite the endometrium being usually thin or invisible, and despite the junctional zone being unclear in postmenopausal women. The MR imaging findings resembled those of a woman of reproductive age and were suspected to be due to changes in estrogen overproduction [10].

We suspected thecofibroma preoperatively because the tumor had a low-signal solid tumor on T2-weighted images, with high estrogen levels. Thecofibroma is characterized by whole solid tumors, reflects abundant fibrous components within the tumor, and is isointense to hypointense compared to the myometrium on T2-weighted images [11]. No fibrosis was observed in the stroma in the tumor of the present case; however, a hypointense solid component was observed on T2-weighted imaging. The low signal intensity in the tumor on T2-weighted images may have been caused by the pathological images having scattered hemorrhagic components.

Differentiation between ovarian endometrioid carcinoma resembling sex cord-stromal tumor and simple sex cord-stromal tumors may be clinically difficult. Furthermore, a pathological misdiagnosis could also occur during hematoxylin-eosin staining [6]. Ovarian solid tumors usually exhibit gradual enhancement patterns in benign tumors and early enhancement patterns in malignant tumors on dynamic contrast MR imaging [12]. Furthermore, malignant epithelial-stromal tumors exhibit early enhancement on dynamic contrast MR imaging [13]. However, in the current case, the atypical ovarian endometrioid carcinoma exhibited a strong enhancement in the early phase of dynamic MR images. These MR dynamic contrast findings are different from thecoma and granulosa cell tumors, which were considered in the differential diagnosis, and could allow for differential diagnosis between atypical endometrioid carcinoma, which is the so-called ovarian endometrioid carcinoma resembling sex cord-stromal tumors, and sex cord-stromal tumors such as thecoma and granulosa cell tumors.

Conclusions

We reported a case of atypical ovarian endometrioid carcinoma, the so-called endometrioid carcinoma resembling a sex cord-stromal tumor, in a postmenopausal woman. The tumor was recognized as a hypointense solid tumor on T2-weighted images with thickening of the endometrium and a rapid en-

hancement pattern in the early phase of the Gd T1-weighted image. Therefore, radiologists should be aware that ovarian endometrioid carcinomas could have appearances similar to sex cord-stromal tumors.

Author contributions

All authors provided final approval of the submitted version.

Patient consent

Informed consent was obtained from the patient for the publication of this report and any accompanying images.

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