Minimal deviation endometrioid adenocarcinoma of the endometrium and its MRI findings

Y. Nakao[1], F. Yamasaki[2], M. Yokoyama[1], S. Aihara[1], M. Yasunaga[3], T. Iwasaka[1]

[1]Department of Obstetrics and Gynecology, Faculty of Medicine, Saga University, Saga
[2]Department of Pathology, Faculty of Medicine, Saga University, Saga
[3]Department of Obstetrics and Gynecology, Saga Prefectural Hospital Koseikan, Saga (Japan)

Summary

Minimal deviation endometrioid adenocarcinoma (MDA-E) of the endometrium is a rare pathological entity, and its radiological features are rarely documented. A 73-year-old Japanese woman was referred to the authors when an endometrial biopsy revealed moderately differentiated endometrioid adenocarcinoma. Preoperative radiological examinations, including ultrasound, computed tomography (CT), and magnetic resonance imaging (MRI) showed no evidence of cancer nests. In the hysterectomy specimen, mildly atypical glands were scattered throughout the entire depth of the myometrium, without stromal desmoplastic reaction, and a tiny focus of typical, ruptured, endometrioid adenocarcinoma glands was found in the atrophic endometrium. MRI had not been able to identify this unusual, scattered, myometrial invasion. It should be kept in mind that in cases showing Stage IA endometrial carcinoma without endometrial thickening on MRI, this rare form of invasion may be present.

Key words: Endometrial carcinoma; MRI; Minimal deviation endometrioid adenocarcinoma of the endometrium; Myometrial invasion.

Introduction

Minimal deviation endometrioid adenocarcinoma (MDA-E) is a rare pathological variation of endometrioid adenocarcinoma, observed mostly in the cervix [1, 2] and rarely found in the endometrium [3-6]. It is defined by a proliferation of mildly atypical endometrial glands with zero to minimal stromal reaction [6, 7]. Recently, the authors encountered a patient with MDA-E and a poor prognosis; her cancer was under-diagnosed by preoperative magnetic resonance imaging (MRI) as Stage IA endometrial carcinoma. In this report, the authors present the clinico-pathological and radiological features of this case.

Case Report

A 73-year-old gravida 7, para 4, Japanese woman was referred to Saga University Hospital because of the presence of endometrial adenocarcinoma on endometrial biopsy. Review of the biopsy specimen showed a proliferation of atypical endometrial glands consisting of endometrial adenocarcinoma with moderate cellular atypia. The endometrial smear showed a high cellularity and many small clusters of neoplastic glandular cells. Palisading of the peripheral cells was present, as were cubical atypical cells with small, hyperchromatic nuclei.

The results of abdomino-pelvic examination were within the normal range. Transvaginal ultrasonography revealed an atrophic endometrium. There were no neoplastic lesions found in the uterine cavity or the uterine corpus by T2-weighted, gadolinium enhanced T1-weighted, or dynamic contrast-enhanced MRI (Figures 1a-c). Computed tomography (CT) showed no evidence of lymphadenopathy or metastatic disease. Serum levels of tumor markers such as CA 125, CA 19-9, and carcinoembryonic antigen were all within normal limits. International Federation of Gynecology and Obstetrics (FIGO 1988) staging was determined to be endometrial carcinoma, Stage IA. The patient subsequently underwent total abdominal hysterectomy, bilateral salpingo-oophorectomy, pelvic lymphadenectomy, and a sampling biopsy of the para-aortic lymph nodes.

The cancer consisted of well-differentiated small glandular cells, extending deeply into the myometrium, almost to the serosal surface. The glands were lined by relatively uniform cubical to columnar cells, closely resembling proliferative phase glands of the endometrium. Two striking features were the lack of desmoplastic stromal reaction, and the infiltrate of chronic inflammatory cells around the majority of glands through the entire depth of the myometrium (Figure 2a). The majority of the endometrium consisted of atrophic glands. A small focus of well-differentiated endometrioid adenocarcinoma, with ruptured glands, was observed in a shallow part of the myometrium (Figure 2b).

The patient underwent postoperative chemoradiotherapy consisting of two cycles of cisplatin (two mg/m^2/day, for seven days each month) and 45 Gy of external whole pelvic radiation. Fifteen months after surgery, she died of carcinomatous pleuritis with multiple lymph node metastases of the upper body. An autopsy was not desired.

Discussion

The depth of myometrial invasion is one of the single most important prognostic factors in endometrial carcinoma, as it correlates with tumor grade, tumor extension into the cervix, and the prevalence of lymph node metastases [8]. Myometrial invasion depth can be assessed preoperatively by several imaging modalities; MRI is believed to be the most reliable tool for this diagnosis. As the authors described in a previous study, MRI is highly accurate for detecting deep myometrial invasion, however, the neg-

Revised manuscript accepted for publication June 24, 2013

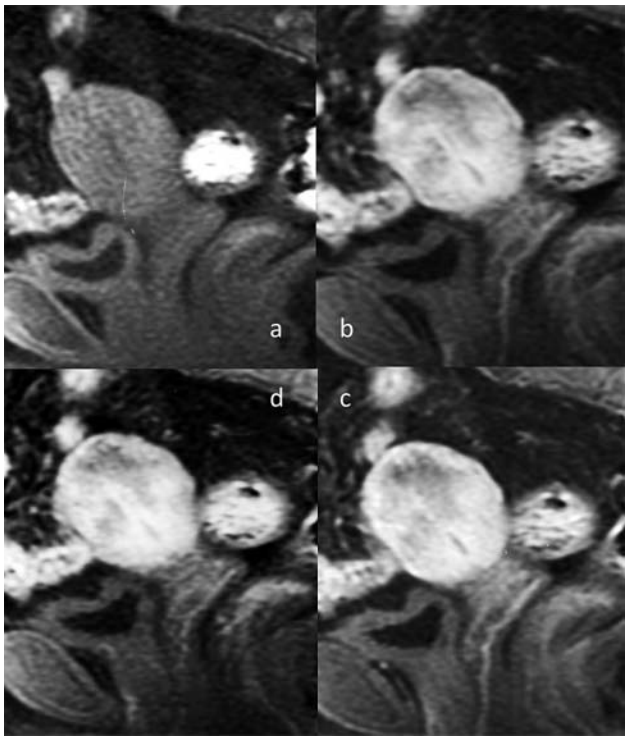

Figure 1 – Sagittal T1 weighted dynamic contrast-enhanced magnetic resonance imaging. (a) pre-gadolinium infusion. (b) 30 seconds post-infusion. (c) 60 seconds post-infusion. (d) 120 seconds post-infusion.

ative predictive value for shallow myometrial invasion is very low [9]. MDA-E is characterized by scattered growth throughout the myometrium, and it does not result in endometrial thickening. Furthermore, the deep, wide spread of MDA-E cells makes it difficult to detect tumor invasion in the myometrium, due to loss of contrast between normal myometrial and cancer cells.

Pure MDA-E is a very rare pathological variant of endometrial adenocarcinoma [7, 10]. Landry *et al.* described four cases of endometrioid adenocarcinoma of the uterus, with a minimal deviation invasive pattern, among 168 hysterectomy specimens designated as endometrioid adenocarcinoma [7]. In the case of the present patient, there were small fragments of typical moderately-differentiated endometrioid adenocarcinoma on the surface of the endometrium. These typical adenocarcinoma cells were detected by both endometrial biopsy and cytology. Therefore, it was much more difficult to make the preoperative diagnosis of pure MDA-E or MDA-E dominant endometrial carcinoma.

This case demonstrates one of the unusual pitfalls of diagnosing the depth of myometrial invasion by MRI. When we meet a patient with Stage IA endometrial adenocarcinoma by MRI, with no endometrial thickening, we should consider the possibility of MDA-E.

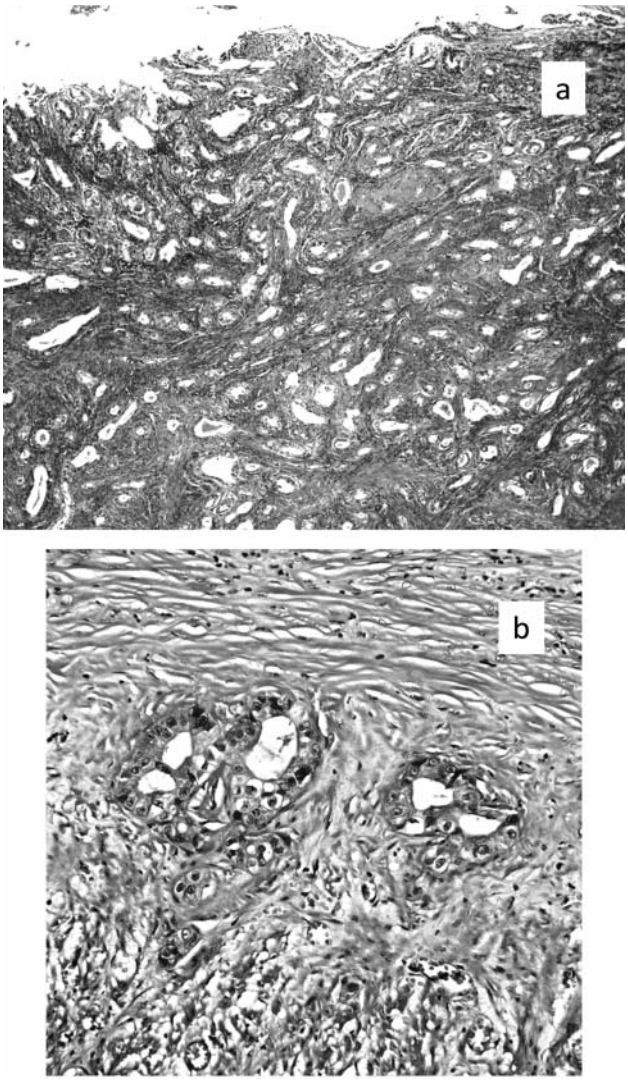

Figure 2 – Diffusely infiltrating glands of minimal deviation endometrial adenocarcinoma (MDA-E). (a) Focal endometrium showing typically invasive endometrioid adenocarcinoma. (b) Glands of MDA-E surrounded by the less desmoplastic stroma.

References

[1] Rahilly M.A., Williams A.R., al-Nafussi A.: "Minimal deviation endometrioid adenocarcinoma of cervix: a clinicopathological and immunohistochemical study of two cases". *Histopathology*, 1992, *20*, 351.

[2] Young R.H., Scully R.E.: "Minimal-deviation endometrioid adenocarcinoma of the uterine cervix. A report of five cases of a distinctive neoplasm that may be misinterpreted as benign". *Am. J. Surg. Pathol.*, 1993, *17*, 660.

[3] Mai K.T., Yazdi H.M., Boone S.A.: "'Minimal deviation' endometrioid carcinoma with oncocytic change of the endometrium". *Arch. Pathol. Lab. Med.*, 1995, *119*, 751.

[4] Nanbu K., Konishi I., Yamamoto S., Koshiyama M., Mandai M., Komatsu T. *et al.*: "Minimal deviation adenocarcinoma of endometrioid type may arise in the isthmus: clinicopathological and immunohistochemical study of two cases". *Gynecol. Oncol.*, 1995, *58*, 136.

[5] Kuwashima Y., Kurosumi M., Kasamatsu T., Shiromizu K., Kishi K.: "Intramural carcinomas of the uterine corpus: a clinicopathological study". *In Vivo*, 1997, *11*, 253.
[6] Longacre T.A., Hendrickson M.R.: "Diffusely infiltrative endometrial adenocarcinoma: an adenoma malignum pattern of myoinvasion". *Am. J. Surg. Pathol.*, 1999, *23*, 69.
[7] Landry D., Mai K.T., Senterman M.K., Perkins D.G., Yazdi H.M., Veinot J.P. *et al.*: "Endometrioid adenocarcinoma of the uterus with a minimal deviation invasive pattern". *Histopathology*, 2003, *42*, 77.
[8] Larson D.M., Connor G.P., Broste S.K., Krawisz B.R., Johnson K.K.: "Prognostic significance of gross myometrial invasion with endometrial cancer". *Obstet. Gynecol.*, 1996, *88*, 394.
[9] Nakao Y., Yokoyama M., Hara K., Koyamatsu Y., Yasunaga M., Araki Y. *et al.*: "MR imaging in endometrial carcinoma as a diagnostic tool for the absence of myometrial invasion". *Gynecol. Oncol.*, 2006, *102*, 343.
[10] Young R.H., Clement P.B.: "Endocervical adenocarcinoma and its variants: their morphology and differential diagnosis". *Histopathology*, 2002, *41*, 185.

Address reprint requests to:
YOSHIFUMI NAKAO, M.D.
Department of Obstetrics and Gynecology,
Faculty of Medicine, Saga University
Nabeshima 5-1-1, Saga City, Saga 849-8501 (Japan)
e-mail: nakaoy@cc.saga-u.ac.jp