

# Stage IA endometrial cancer recurrence around the ureter after laparoscopic surgery

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Minimally invasive surgery has become a standard treatment for early-stage endometrial cancer. Its outcomes are not inferior to those of open surgery, and it has a good prognosis. Thus, there have been a few studies on recurrence patterns in low-risk endometrial cancer. We described the case of a 45-year-old multiparous woman with the International Federation of Gynecology and Obstetrics stage IA, grade 1 endometrioid endometrial cancer, who was treated with laparoscopic modified radical hysterectomy with bilateral adnexectomy and pelvic lymph node dissection. The patient developed isolated recurrence around the left ureter 27 months later, which was also laparoscopically resected. Pathologically, she had a low risk of recurrence; therefore, we had to review our surgical procedures. The findings of a recent study have led to the development of the theory that there is a laparoscopy-specific recurrence pattern. We discussed this recurrence pattern in relation to our patient's case and aimed that our findings will prompt to reconsider laparoscopic surgery in preventing tumor spread and recurrence in early-stage low risk endometrial cancer.

## Keywords

Minimally invasive surgery; Endometrial cancer recurrence; Modified radical hysterectomy; Stage IA endometrial endometrioid cancer

## 1. Introduction

Endometrial cancer is one of the most common cancers among women. Its most common histological type is endometrioid carcinoma, and most cases are diagnosed early [1]. The long-term prognosis for patients with endometrial cancers with a low risk of recurrence is good, and the 5-year survival rate for patients with International Federation of Gynecology and Obstetrics (FIGO) stage IA cancer is 2–15% [2, 3]. Over the past decade, minimally invasive surgery has been the preferred technique over open surgery, with both its outcomes and prognosis comparable to those of open surgery [4]. The factors regarded as recurrence risks for stage I endometrial cancers include deep muscle layer invasion, lymphovascular space invasion (LVSI), and the cancer grade and histological type [5]. Although the rates and sites of recurrence following laparoscopic surgery are supposedly similar to those of open surgery, studies have reported trocar site and other recurrence patterns that are not typically observed after

open surgery [4].

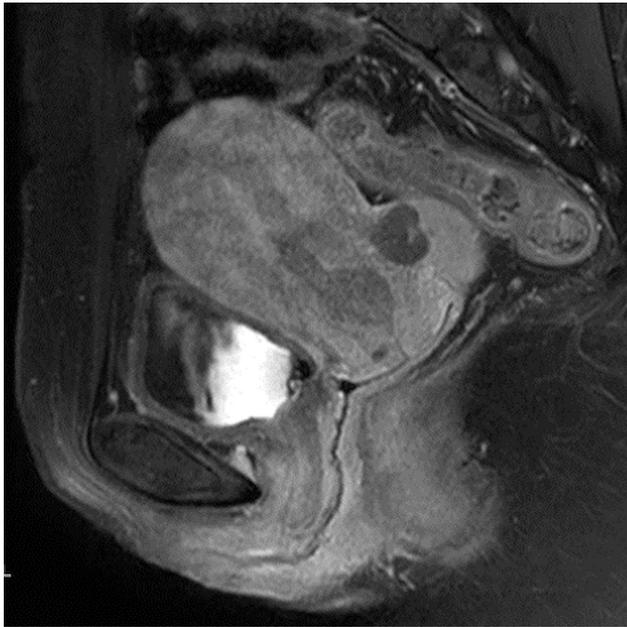
We laparoscopically examined and resected the tumor, and pathological testing confirmed an endometrial endometrioid cancer recurrence. This case of isolated recurrence around the ureter in a patient with stage IA, low-risk endometrial cancer is uncommon. We investigated this recurrence pattern from both the pathological and technical perspectives.

## 2. Case report

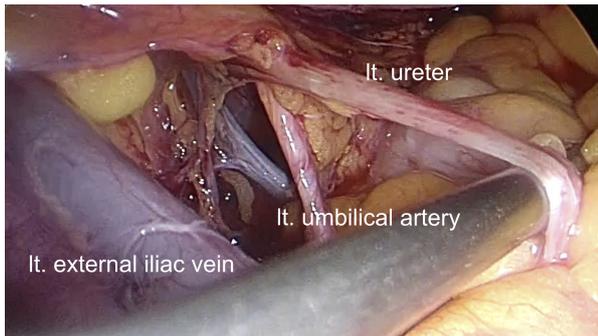
A 45-year-old gravida 3 para 2 woman with an unremarkable medical history presented to our hospital in September 2016 with irregular vaginal bleeding. A cervical smear was conducted and tested for atypical glandular and cervical cancer cells, the results of which were class IV. A cervical punch biopsy revealed no evidence of malignancy; however, endometrial tissue biopsy resulted in a diagnosis of grade 1 endometrial adenocarcinoma. Dynamic contrast-enhanced magnetic resonance imaging (MRI) showed a mass in the lower uterine corpus that demonstrated washout, with invasion into less than half of the underlying muscle layer (Fig. 1). Positron emission tomography/computed tomography (PET/CT) did not reveal any abnormal uptake suggestive of distant metastasis; the patient was subsequently diagnosed with clinical stage IA cancer.

In November 2016, we performed laparoscopic modified radical hysterectomy with bilateral adnexectomy and pelvic lymph node dissection (Fig. 2). The pathological diagnosis was grade 1 endometrial adenocarcinoma with invasion into less than 1 mm of the muscle layer and no vascular invasion. Although part of the tumor reached the cervical glands, no stromal invasion was evident (Fig. 3), and intraperitoneal cytology was negative.

The patient continued to attend regular outpatient appointments with no signs of recurrence; however, in January 2019, she complained of left inguinal pain. A CT scan was performed in March, and a mass with contrast enhancement around the left ureter was observed (Fig. 4). Moreover, PET/CT showed contrast uptake with a max-



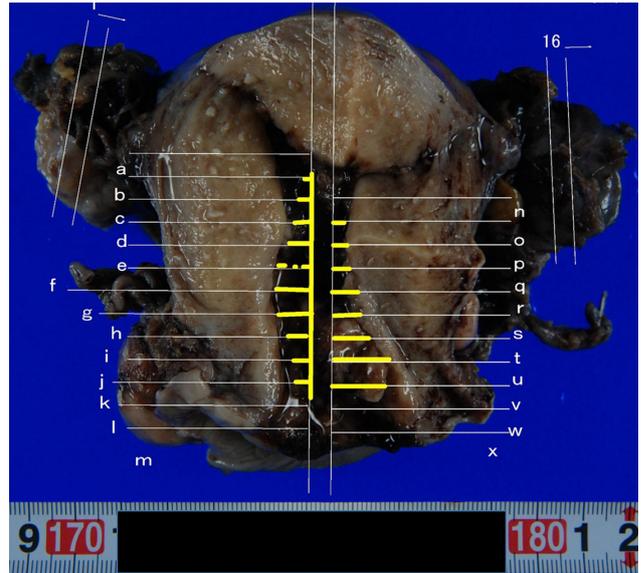
**Fig. 1. Preoperative pelvic T1-weighted sagittal contrast-enhanced MRI scan from September 2016.** A mass extending from the cervical region to the uterine corpus is visible. MRI, magnetic resonance imaging.



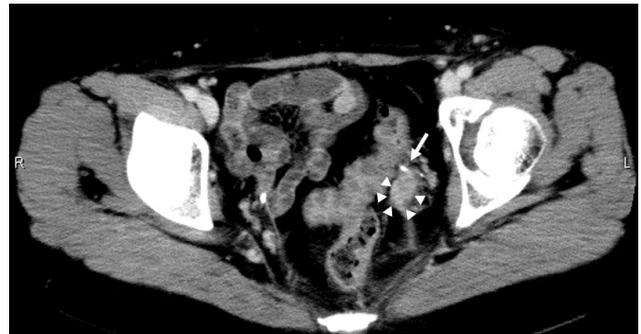
**Fig. 2. Left pelvic cavity during the initial surgery (after hysterectomy, bilateral adnexectomy, and pelvic lymph node dissection).** The ureter has been detached and is lying free in the abdominal cavity.

imum standardized uptake value of 10.3 at the same site; the patient was diagnosed with endometrial cancer recurrence. Staging laparoscopy was performed in April 2019, and the tumor around the ureter was identified (Fig. 5) and resected. Partial ureterectomy or urinary diversion was not performed because the tumor did not invade the muscularis of the ureter. Pathological testing revealed signs of endometrial carcinoma that were similar to those of the initial cancer (Fig. 6). Peritoneal wash cytology was negative. Postoperatively, six courses of paclitaxel and docetaxel therapy were administered, and no subsequent signs of recurrence were observed.

The patient provided oral consent for publication of her clinical case details. This case report was conducted in accordance with the Declaration of Helsinki and was approved by the Institutional Review Board of Kawasaki Medical School.



**Fig. 3. Gross findings of the resected sample.** The tumor can be seen within the yellow line.



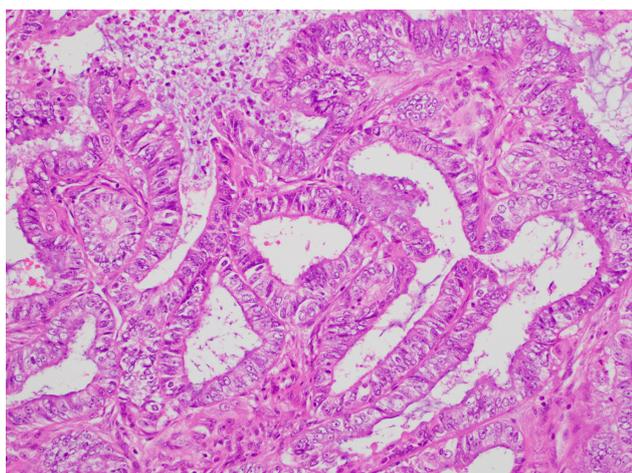
**Fig. 4. CT scan when the recurrence was identified in March 2019.** A contrast-enhanced mass (arrowhead) is evident on the dorsal side of the ureter (arrow). CT, computed tomography.



**Fig. 5. Area around the left ureter during the second surgery.** The ureter can be seen passing through the recurrent tumor (yellow area).

### 3. Discussion

Studies have found that the 5-year survival rate is over 90% for patients who are preoperatively diagnosed with stage I endometrial cancer and who undergo simple hysterectomy



**Fig. 6. Pathology photograph of the recurrent tumor.** The tumor shows signs of Grade 1 endometrial cancer with squamous metaplasia.

and bilateral adnexectomy [6, 7]. The recurrence rate for stage IA-only patients is even lower [8]. Minimally invasive surgery for endometrial cancer, which was introduced in our hospital in 2014, has been performed in about 20 cases so far. This is the first case of postsurgical stage IA endometrioid grade 1 cancer recurrence, and the recurrence rate to date is 3% (1/32).

Interestingly, the recurrence was localized around the ureter in this case. The most commonly reported site of recurrence in stage I endometrial cancer was the vaginal resection margin, followed by the pelvic cavity [2, 3, 9], the recurrence rates of which are reportedly 1.6–6.4% and 2.0–3.4%, respectively [3]. However, the frequency of ureteral recurrence is unknown. There are several reports of metastasis to the ureter in gastric and rectal cancer [10, 11]. Regarding the mechanisms underlying metastasis to the ureter, the following two phenomena are considered: First, direct extension from the primary site, peritoneal deposit, or lymph node metastasis of endometrial cancer may involve the ureter. These cases are usually observed in very advanced cancer, and isolated recurrence at the ureter is rare. Second, distant metastases, so-called true metastases, to the ureter may occur from the primary site through lymphatic and/or blood vessels. In most cases, synchronous metastatic lesions were observed in other organs or lymph nodes [10]. No tumoral lesion was observed in the periureteral space of the patient during surgery, indicating that this was a case of true distant ureteral metastasis from the primary lesion or some other mechanism.

The most crucial prognostic factors for early endometrial cancer are the histological type, grade, and depth of myometrial invasion [12]. Additionally, LVSI has been reported as an independent factor associated with lymph node metastasis, recurrence, and prognosis [13–17]; however, this factor was not observed in our patient. In this case, the tumor was located in the lower uterine segment (LUS). Endometrial cancer commonly develops in the uterine corpus; however, en-

dometrial cancer that develops in the uterine isthmus is considered to have emerged from the LUS. Endometrial cancer that extends into the LUS is associated with muscle layer invasion, cancer grade, and highly malignant histological types [18]. Endometrial cancer that spreads into the LUS in stage I has a poor prognosis [19, 20]. In our patient, tumor extension into the LUS may have been a contributing factor to the recurrence.

Regarding the curative nature of minimally invasive surgery for endometrial cancer, previous meta-analyses have shown that the number of retroperitoneal lymph nodes removed is equivalent to that in open surgery [21, 22]. Similarly, results from the Surveillance, Epidemiology, and End Results database have shown no significant difference between the recurrence and survival rates for laparoscopic and open surgery, and the latter has been considered a standard treatment option for endometrial cancer in patients with a low risk of recurrence. In our hospital, we performed modified radical hysterectomy, bilateral adnexectomy, and pelvic lymph node dissection for stage IA endometrial cancer. Pelvic lymph node dissection was performed for accurate surgical staging and treatment choice [23]. Reportedly, uterine manipulator use did not affect prognosis in endometrial cancer [24]. However, this did not prove that the use of manipulators does not contribute to recurrence. Hence, we did not use manipulators; instead, we closed the external uterine orifice with a Z-suture. Furthermore, we clipped the fallopian tubes to prevent tumor cells from entering the abdominal cavity, which would result in cancer dissemination. Recent reports have described the value of using a collection bag to prevent tumor spread during transvaginal sample collection [25, 26]. This is because previous studies found that the laparoscopic removal of large uterine malignancies increased the recurrence rate [27–29]. This technique is effective for preventing tumor scattering, even if the tumor is not large, and should be adopted as a standard in transvaginal sample collection for uterine malignancies. In this case, we did not use a bag to collect the sample. However, since then, our facility has started placing resected samples in a collection bag.

The LAP2 study, which compared the outcomes of minimally invasive and open surgeries, observed no differences in the recurrence sites between the two techniques [4]. However, it did note that trocar site recurrence is laparoscopy-specific. Its incidence is 0.24%, which can hardly be considered a high rate given that the LAP2 study included patients diagnosed with endometrial cancer up to stage IIA; however, this showed that it was a laparoscopy-specific pattern of recurrence. In addition, trocar site recurrence has been reported in stage IA endometrial cancer [30]. The mechanisms may be related to the pneumoperitoneum and tissue handling [31–33].

In this study, we considered the recurrence pattern of this case to be irregular. Thus, we reviewed our procedure with some literature not only pathologically. Although it is unclear whether this recurrence resulted from a technical issue asso-

ciated with laparoscopy, every attainable preventive measure should be taken to eliminate the possibility. Surgery should not simply be performed because it is feasible; it is only indicated when the procedure is beneficial for the patient. As surgeons, this point should be kept in mind.

In conclusion, we report an unusual case of localized recurrence of stage IA endometrial cancer around the left ureter despite this being a patient with a histologically low risk of recurrence. Large-scale studies are required to investigate the postoperative recurrence of early-stage endometrial cancer following laparoscopic surgery.

### Author contributions

RS and YO were mainly responsible for every stage of the preparation of this case report, from manuscript preparation to corrections. MS and SS provided both surgical support and information that furthered our understanding of case-related matters and contributed to the manuscript corrections. TM contributed to the pathological assessment, and selection and photography of the characteristic pathological images needed to understand this case. All authors have read and approved the final manuscript.

### Ethics approval and consent to participate

The patient provided oral consent for the publication of her case report. This study was conducted in accordance with the Declaration of Helsinki and was approved by the Institutional Review Board of Kawasaki Medical School.

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### Conflict of interest

The authors declare no conflict of interest.

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