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Case Report
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Late Port Site Metastases After Minimally Invasive Surgery for Early-Stage Endometrial Carcinoma: A Case Report

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Abstract

Objectives: We report two cases with late-presentation of Port site metastases (PSMs) in early-stage low-risk endometrioid endometrial adenocarcinoma.

Methods: A retrospective review of two patients with FIGO 2009 stage IA grade 1 endometrioid endometrial cancer who developed PSM from 2011 to 2025 at the Northwell Health and Northwell Cancer Institute. Treatment and outcome data were collected.

Results: Median age at time of recurrence was 72.6 years. Both patients had FIGO 2009 stage IA grade 1 endometrioid endometrial adenocarcinoma, however one patient had concomitant stage IC grade 2 endometrioid adenocarcinoma of the right fallopian tube and received adjuvant chemotherapy. The median interval from initial endometrial cancer diagnosis to development of the PSM was 10.8 years (range, 8.9–12.8 years), with the PSM being consistent with their original endometrial cancer pathology and surgical resection being performed in both patients. At a median follow-up of 14.5 years, both patients are alive and disease-free.

Conclusions: Late presentation of PSMs following early-stage low-risk endometrioid endometrial cancer is a rare entity. The long disease-free intervals between initial diagnosis and port site recurrence supports the use of aggressive management to achieve favourable clinical outcomes.

Keywords: Minimally invasive surgery; Gynecology; Pathology

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Introduction

Endometrial Cancers (ECs) are the most common gynecologic malignancy in the United States with a rapidly increasing incidence and 69,120 new cases predicted in 2025 [1,2]. The majority of ECs are diagnosed at stage I/II, with an average 5-year overall survival (OS) over 90%. The primary treatment for apparent uterine-confined EC is a total hysterectomy with bilateral salpingo-oophorectomy and lymph node assessment [1]. Following the publication of several randomized controlled trials, the use of minimally invasive surgery for the surgical staging of ECs has now become standard of care due to lower rates of surgical site infections, shorter hospital stays, and lower cost of care [3]. Port site metastases (PSMs) have been reported in 1% to 2% across all malignancies, with the highest incidence reported in ovarian cancers (19.6%). PSMs in gynecologic malignancies remains an unpredictable and under-reported entity in EC (0.18% to 0.33%) [4]. There are several theories for the development of PSMs after minimally invasive surgery, including implantation of tumor cells into the wound due to sub-optimal surgical and aseptic technique, gas exposition causing immune reactions, or a "chimney effect", where aerosolized tumor cells leak directly into the port site [4]. Although it is a rare occurrence, the majority of the reported cases of PSMs in EC were found in those who had stage III disease and with aggressive high-grade histologies [5,6]. We describe two cases of late PSMs in early-stage, grade 1 endometrioid endometrial adenocarcinoma identified and treated at our institution.

Case Presentation

Case 1

An 81-year-old with International Federation of Gynecology and Obstetrics (FIGO) 2009 stage IA grade 1 endometrioid endometrial adenocarcinoma who underwent a robot-assisted total laparoscopic hysterectomy, bilateral salpingo-oophorectomy, and bilateral pelvic sentinel lymph node mapping and biopsies in December 2012. Final pathology revealed a grade 1 endometrioid

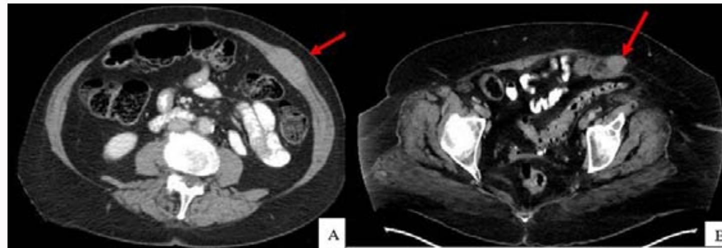

Figure 1: Pre-operative radiographic studies of port-site metastasis. (**1A).** Case 1, computed tomography of abdomen and pelvis with intravenous and oral contrast showing a 4.5 centimeter left abdominal wall metastatic implant, (**1B).** Case 2, computed tomography of abdomen and pelvis with intravenous contrast showing a left abdominal wall metastatic implant.

endometrial adenocarcinoma with no lymphovascular space invasion (LVSI), 6.7% myometrial invasion, microsatellite stable, p53 wild-type, and negative pelvic washings. The surgery was uncomplicated with no uterine perforation or dislodged ports. The surgical specimens were removed through the vagina. The patient did not require adjuvant treatment and was placed on routine clinical surveillance. In November 2013, a biopsy-proven recurrence at the vaginal apex was diagnosed. Positron Emission Tomography-Computed Tomography (PET/CT) demonstrated no other sites of recurrence, and the patient received combination External Beam Radiation Therapy (EBRT) and Vaginal Brachytherapy (VBT) at an outside institution. The patient had no evidence of disease for seven years until she presented in November 2021 with a two-month history of left lower quadrant mass and pain at her port site. A CT scan demonstrated a 4.5 cm × 2.1 cm × 3.6 cm left anterior abdominal wall mass, which was later shown to be Fluorodeoxyglucose (FDG) avid along with new left pelvic lymph nodes (Figure 1A). A biopsy of the abdominal wall mass in December 2021 confirmed recurrent EC, and was estrogen receptor positive, microsatellite stable, and Programmed Death-Ligand 1 (PD-L1) negative. Due to her prior radiation being administered at an outside institution, records were not available to ascertain whether the PSM was within the prior radiated field. The patient received three cycles of carboplatin and paclitaxel from January to March 2022 with a marked decrease in the size of the PSM and resolution of the pelvic lymphadenopathy. In April 2022, she underwent surgical resection with an exploratory laparotomy, resection of left abdominal wall mass, and reconstruction with component separation and mesh placement. The patient received a maintenance aromatase inhibitor in May 2022 but self-discontinued after one year due to side effects. At last follow-up in January 2025, she remained without evidence of disease.

Case 2

A 69-year-old with an endometrial biopsy demonstrating grade 1 endometrioid endometrial adenocarcinoma underwent a laparoscopic hysterectomy and bilateral salpingo-oophorectomy, with conversion to laparotomy and surgical staging after an incidental intra-operative diagnosis of fallopian tube carcinoma in February 2011. The final pathology revealed a synchronous FIGO 2009 stage IA grade 1 endometrioid endometrial adenocarcinoma with no LVSI or myometrial invasion, microsatellite stable, p53 wild-type with negative pelvic washings, and a stage IC grade 2 endometrioid adenocarcinoma of the right fallopian tube. While the surgery was converted to laparotomy, there were no intra-operative complications, no uterine perforation, no dislodged ports, and the midline laparotomy incision was used for specimen extraction. Although her EC did not meet criteria for adjuvant therapy, due to the concurrent fallopian tube cancer she completed six cycles of adjuvant carboplatin and paclitaxel in July 2011. Her post-operative course was complicated with a saddle pulmonary embolism, which was successfully treated with a thrombolytic agent. The patient remained without evidence of disease for twelve years until a routine surveillance CT scan of the abdomen/pelvis in November 2023 revealed a new vaginal cuff nodule and a left lower quadrant abdominal wall mass at her port site (Figure 1B). PET/CT in January 2024 demonstrated an FDG-avid soft tissue nodule at the vaginal cuff and two FDG-avid nodules in the left lower quadrant anterior abdominal wall. A biopsy revealed fragments of carcinoma that was estrogen receptor positive, microsatellite stable, and PD-L1 negative, consistent with the original endometrial tumor pathology and not the fallopian tube cancer. The patient underwent surgical resection with a robot-assisted laparoscopic resection of the anterior abdominal wall and vaginal cuff masses in March 2024. The patient has remained on an aromatase inhibitor since March 2024 and was without evidence of disease at her last follow-up in September 2025.

Discussion

The first case of PSM following minimally invasive surgery for EC was reported in 1997 [7]. Despite several subsequent case reports describing this phenomenon, it remains a rare entity in EC with a reported incidence as low as 0.2% [8]. Our case report demonstrates that although uncommon, PSMs can occur in low-risk EC.

The pathophysiology of PSM is not well described with several theories pertaining as to its biology. Proposed influencing factors include the use of gas for abdominal insufflation and consequent efflux around the trocars, the type of gas used, surgical technique, high intraperitoneal pressure leading to higher chance of implantation of tumor cells, and repeated re-insertion and manipulation of instruments through the trocars leading to seeding of tumor cells [4,9,10]. However, the data available is controversial as some studies report an equivalent risk of tumor recurrence at the incision site across laparoscopic and open surgery. Comparatively, other studies report a three-times-increased incidence of incision site tumor recurrence in laparoscopic surgery [11,12]. Despite the use of lower intra-peritoneal pressure and decreased re-insertion of instruments through the trocars during robotic surgery compared to conventional laparoscopy, there has been no reported difference found in the incidence of PSM between robotic and laparoscopic approaches [13].

Of the reported PSM in EC patients, the majority are in the setting of concomitant distant metastases. Both cases presented with vaginal cuff recurrences, the first case at 1 year after their initial surgery that was treated with adjuvant radiation therapy and then subsequently developed a PSM 8 years later, and the second case developed their

vaginal cuff recurrence at the same time as their PSM. One prospective study by Lonnerfors et al. [14] reported nine patients of 475 (1.9%) with a PSM following surgery for EC, with all nine patients having received adjuvant radiation therapy following their initial surgery. However, these patients had initially presented with stage III/IV EC. This is not in keeping with our patients who had stage IA grade 1 disease. Additionally, both of our patients had their PSM occur at a site where surgical specimens were not extracted from.

A systematic review by Palomba et al. described PSM associated with EC to be an aggressive disease, with only one patient alive and free of disease 10 months after their disease recurrence [15]. By contrast, we report favourable outcomes in our two patients following surgical resection. From initial diagnosis to last follow-up, the median follow-up for both patients were 14.5 years with both patients remaining disease-free and alive, with the longest follow-up interval after development of the PSM being 5 years.

Despite the second case having a synchronous fallopian tube cancer, the recurrence at both the vaginal cuff and port site was consistent with their endometrial cancer. To our knowledge, this is the first case report describing a synchronous primary endometrial and fallopian tube cancer with the addition of a PSM. The surgical techniques differed greatly between the two cases, with the first being completed laparoscopically and the second converted to laparotomy. However, despite being converted to an open procedure and the laparoscopic port no longer in use for the remainder of the surgery, the second case still developed a PSM. Both patients have similar pathology and molecular testing, with the initial tumors having no LVSI, microsatellite stable, and p53 wild-type, and the recurrences both being estrogen receptor positive, microsatellite stable, and PD-L1 negative.

Limitations of our case series include a small sample size secondary to the rare occurrence of PSM in early-stage EC. Nevertheless, we report more cases of late presentation of PSM in EC compared to what is currently available in the literature with a median interval of 10.8 years (range, 8.9-12.8 years) from initial EC diagnosis to the development of PSM. A study by Grant et al. [9] reported a median interval of only 15 months from laparoscopy to radiographic diagnosis of PSM. To our knowledge, we are the first to describe a late presentation of PSM in low-risk EC with positive outcomes.

In conclusion, the driving factors for development of PSM in early-stage EC with no apparent risk factors for recurrence remains unknown. The etiology remains unclear and likely multifactorial. Our cases support the use of aggressive local treatment with curative intent given the favourable long-term survival outcomes.

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