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## A case of laparoscopy-assisted vaginal cuff suturing for vaginal cuff dehiscence after total laparoscopic hysterectomy



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## ABSTRACT

**INTRODUCTION:** Vaginal cuff dehiscence after hysterectomy is a rare complication and occurs in less than 1% of patients. It can present with serious complications, such as bowel evisceration and peritonitis.

**PRESENTATION OF CASE:** A 51-year-old multigravida Korean woman underwent total laparoscopic hysterectomy for leiomyoma. Six months later, she reported lower abdominal pain and vaginal bleeding. Physical examination revealed rebound tenderness in the lower abdomen, and pelvic examination showed a small amount of vaginal bleeding with an evisceration of the small intestine through the vagina that exhibited healthy peristalsis. The eviscerated bowel, which seemed to be a part of the ileum, was carefully manually reduced transvaginally into the abdominal cavity. Laparoscopic observation revealed adhesions between the omentum, small intestine, and the peritoneum. Specifically, the small intestine was adhered around the vaginal cuff. An abdominal abscess was found in the left lower abdominal cavity. An adhesiotomy was performed and the abdominal abscess was removed and irrigated. Complete separation of the anterior and posterior vaginal cuff edges was obtained. The vaginal cuff was closed with interrupted 0-polydioxanone absorbable sutures without bowel injury. A 6-month follow-up examination revealed complete healing of the vaginal cuff.

**DISCUSSION:** In this case, we were able to make use of both laparoscopic and transvaginal methods to perform a successful repair with a minimally invasive and safe technique.

**CONCLUSION:** Laparoscopically assisted vaginal cuff suturing for vaginal cuff dehiscence after total laparoscopic hysterectomy was found to be effective, safe, and minimally invasive.

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### 1. Introduction

Vaginal cuff dehiscence after hysterectomy is a rare complication and occurs in less than 1% of patients. Although the incidence rate is low, it can present with serious complications, such as bowel evisceration and peritonitis. There are many reports of vaginal and abdominal repair of vaginal cuff dehiscence, but few of these procedures are laparoscopic. We report a case of laparoscopically assisted vaginal cuff suturing for vaginal cuff dehiscence with peritonitis, adhesions, and small bowel evisceration after total laparoscopic

hysterectomy (TLH), and highlight the merits of both laparoscopic treatment and transvaginal suturing.

This work has been reported in line with the SCARE criteria [1].

### 2. Presentation of case

A 51-year-old multigravida Korean woman underwent TLH for leiomyoma. She had an uncomplicated postoperative course. The details of the laparoscopic hysterectomy are unknown. She underwent TLH in a foreign country and we were unable to obtain her records from this procedure, which would have indicated the type of suturing that was performed during TLH. Sexual intercourse was permitted 3 months after the hysterectomy. Six months later, she visited our hospital due to lower abdominal pain and vaginal bleeding that started the second day after sexual intercourse. She had no past history of abdominal surgery prior to hysterectomy and had no significant medical or family history. Physical examination revealed rebound tenderness in the lower abdomen and pelvic examination showed a small amount of vaginal bleeding and an evisceration of the small intestine through the vagina (Fig. 1). The eviscerated small

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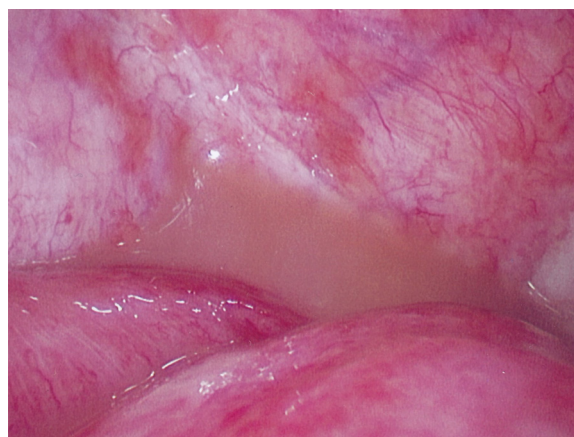
**Fig. 1.** Pelvic examination revealed evisceration of the small intestine through the vagina.

**Table 1**  
Clinical laboratory data.

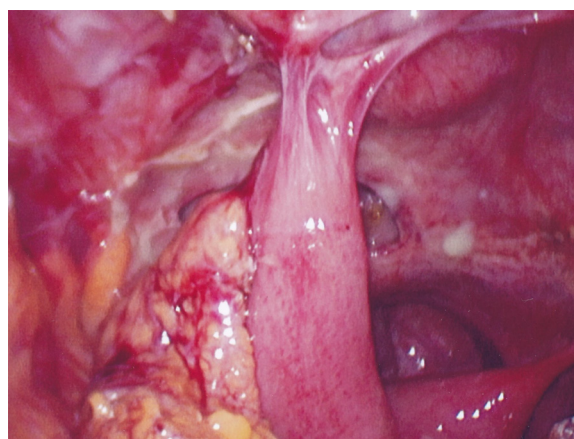
		Reference ranges
White blood cell count ( $10^9/L$ )	14.4	3.3–8.6
Differential count (%)		
Neutrophils	91.4	41.7–73.7
Lymphocytes	6.3	18.4–44.8
Monocytes	2.1	4.6–12.3
Eosinophils	0.1	0.7–8.1
Basophils	0.1	0.2–1.4
Hemoglobin (g/L)	136	116–148
Platelet count ( $10^9/L$ )	230	158–348
Amylase ( $\mu\text{kat/L}$ )	0.75	0.73–2.2
Creatinine ( $\mu\text{mol/L}$ )	56.6	40.1–69.8
Lactate dehydrogenase ( $\mu\text{kat/L}$ )	2.6	2.1–3.7
Glucose (mmol/L)	6.2	4.1–6.1
C-reactive protein (nmol/L)	367.6	0–13.3

intestine appeared peristaltic and not ischemic. Internal examination revealed complete dehiscence of the vaginal cuff. Her body temperature was 36.9 °C, blood pressure was 118/69 mmHg, pulse rate was 82 beats per minute, and respiratory frequency was 20 breaths per minute. Elevated white blood cell count, neutrophil differentials, and C-reactive protein values indicated inflammation. A bowel injury was not suspected since the lactate dehydrogenase level was within the normal range. Laboratory results are shown in [Table 1](#). No radiological examination was performed.

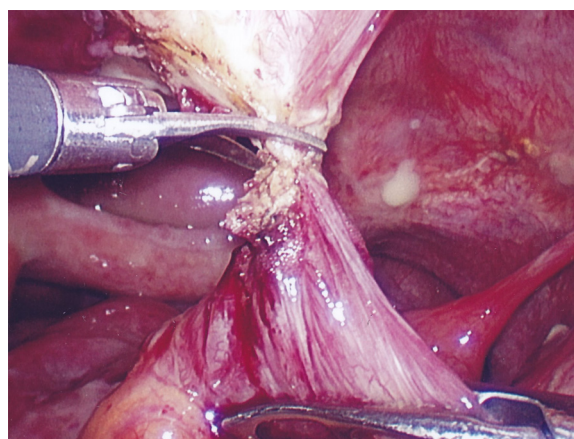
The patient was admitted to our hospital and combined laparoscopy with a vaginal approach for vaginal cuff dehiscence was performed. Before starting the operation, intravenous antibiotic (ampicillin/sulbactam) was administered. The eviscerated bowel, which appeared to be a part of the ileum, was carefully transvaginally reintroduced manually into the abdominal cavity. Laparoscopic observation revealed adhesions between the omentum, small intestine, and the peritoneum. Specifically, the small intestine was adhered around the vaginal cuff. An abdominal abscess was identified in the left lower abdominal cavity ([Fig. 2](#)). Only the right edge of the vaginal cuff was recognizable due to adherence of the small intestine and the presence of purulent fluid ([Fig. 3](#)). A laparoscopic adhesiotomy between the omentum and the peritoneum, and between the small intestine and the peritoneum, was performed ([Fig. 4](#)). The abdominal abscess was removed and the area was irrigated with warmed saline. After laparoscopic adhesiolysis and lavage of the abdominal cavity, complete separation



**Fig. 2.** An abdominal abscess was identified in the left lower abdominal cavity.



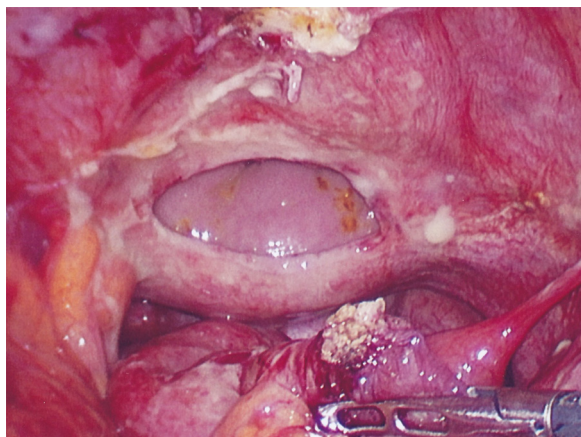
**Fig. 3.** Adhesiotomy between the omentum and the peritoneum as well as between the small intestine and the peritoneum was performed laparoscopically.



**Fig. 4.** Adhesiotomy around the vaginal cuff was performed laparoscopically.

of the anterior and posterior vaginal cuff edges was accomplished ([Fig. 5](#)). The vaginal cuff was closed transvaginally with interrupted 0-polydioxanone absorbable sutures (PDS® II: ETHICON Endo-Surgery, Inc). The patient had an uneventful postoperative course and was discharged from our hospital on postoperative day 7. *Streptococcus pyogenes* (Group A) was detected in the abdominal purulent fluid culture. A 6-month follow-up examination revealed complete healing of the vaginal cuff.





**Fig. 5.** The complete separation of the anterior and posterior vaginal cuff was revealed after adhesiotomy.

### 3. Discussion

Vaginal cuff dehiscence after hysterectomy is a rare complication. Four large studies reported similar incidences of vaginal cuff dehiscence, ranging from 0.30% to 0.39% [2–5]. Although the incidence rate is low, it can present with serious complications, such as bowel necrosis, ileus, bowel evisceration, and peritonitis. Evisceration is observed in 35% to 67% of all cases of vaginal cuff dehiscence [3,4]. The incidence of vaginal cuff dehiscence appears to be higher after laparoscopic and robotic approaches compared with other modes of hysterectomy [2–4,6,7]. Factors contributing to vaginal cuff dehiscence remain unclear. The thermal effect of electro-surgical instruments used during colpotomy and the modes of vaginal cuff closure technique are putative contributing factors [3,8]. Accordingly, the laparoscopic colpotomy used at the time of the hysterectomy may have contributed to vaginal cuff dehiscence in our patient. Somkuti et al. described 10 risk factors for vaginal rupture after an abdominal or vaginal hysterectomy: (1) poor technique, (2) postoperative infection, (3) hematoma, (4) coitus before healing, (5) age, (6) radiotherapy, (7) corticosteroid therapy, (8) trauma or rape, (9) previous vaginoplasty, and (10) use of the Valsalva maneuver [9]. According to Ceccaroni, sexual intercourse before complete healing of the vaginal cuff is the main precipitating cause in young patients, while evisceration presents as a spontaneous event in elderly patients [4]. Agdi et al. found that the main precipitating cause of vaginal cuff dehiscence among women aged 40–51 years was sexual intercourse [7]. In our case, the patient had two risk factors: infection and sexual intercourse.

The dominant cause of vaginal cuff dehiscence is unclear. Our patient had no risk factors for delayed healing of the vaginal cuff. Furthermore, before arriving at our hospital, there were no symptoms of infection. Therefore, sexual intercourse seems to be the trigger event. Ascending bacterial infection via the dehisced vaginal cuff resulted in abdominal abscess and peritonitis. There is no evidence-based recommendation regarding the time to restart coitus after hysterectomy. Kahramanoglu et al. proposed that patients should be asked to avoid sexual intercourse for at least 8 weeks after hysterectomy [10]. Our patient did not restart coitus early. Further studies are needed to determine the optimal timing before resuming sexual intercourse.

Various surgical techniques have been described for the repair of vaginal cuff dehiscence, including vaginal, abdominal, laparoscopic, and combined approaches. The vaginal approach is used due to its convenience and minimal invasiveness; however, with this technique, observation of the whole abdominal cavity is difficult, which also makes irrigation difficult. Matthews et al. concluded that the

transvaginal approach for vaginal cuff dehiscence should be considered only if the patient is medically stable and has no clinical evidence of peritonitis or bowel injury [11].

Transvaginal repair has the danger of causing unexpected bowel injury in cases of abdominal organ adhesions around the vaginal cuff. In addition, vaginal cuff closure without abdominal irrigation is an insufficient therapy when peritonitis is associated with abdominal abscess. In this case, there was the risk of causing damage to the small intestine if we performed a transvaginal stump closure without adhesiotomy. Potential bowel injury or peritonitis should be considered in cases of bowel evisceration, such as what was observed in this patient. Meanwhile, if one were to use the abdominal approach, observation and irrigation in the abdominal cavity are possible. However, it is hard to observe the upper abdominal cavity and the incision wound has to be increased. Using a laparoscopic approach, the incision wound does not increase and visibility for irrigation and adhesiotomy are comparable to the abdominal approach, although the transvaginal cuff closure technique is more difficult. Hwang et al. found no significant differences between transvaginal and laparoscopic sutures regarding cuff-related complications in patients undergoing TLH [12]. Meanwhile, Uccella et al. reported a multi-institutional analysis of 12,398 patients who underwent hysterectomy and concluded that transvaginal suturing reduced the risk of vaginal cuff dehiscence after TLH [3].

In our case, we were able to make use of benefits of both the laparoscopic and transvaginal approaches. In doing so, laparoscopic observation, adhesiotomy, irrigation of the abdominal cavity, and transvaginal closure of the vaginal cuff were performed safely. In addition, we avoided extension of the abdominal incision using the previous surgical scar. Such potential complications were avoided using a laparoscopic approach. Indeed, the laparoscopic procedure for vaginal cuff repair is minimally invasive and facilitates the observation and safe performance of procedures in the abdominal cavity. Since few reports exist of laparoscopic vaginal and abdominal repair of vaginal cuff dehiscence, this case highlights the utility of such an approach.

### 4. Conclusion

In conclusion, we report a case of laparoscopy-assisted vaginal cuff suturing for vaginal cuff dehiscence after TLH. The possibility of bowel injury or peritonitis should be considered in cases of vaginal cuff dehiscence.

Laparoscopic suturing of the vaginal cuff is minimally invasive and useful for avoiding abdominal organ injury during vaginal cuff closure. Laparoscopy may contribute to safe closure for vaginal cuff dehiscence after hysterectomy.

### Conflicts of interest

We have no personal or financial conflicts of interest related to the preparation and publication of this manuscript.

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### Ethical approval

Written informed consent was obtained based on the document (document ID 2043) which is approved by ethical review board in our hospital.

## Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

## Author contribution

1. Tomoatsu Jimi, MD. – writing the paper, data collection, editing and interpretation.
2. Rumiko Yamamoto, MD. – assistant operator.
3. to 10. Koji Seo, MD. Mari Matsuoka, MD. Saori Hata, MD. Yukiko Ando, MD. Hiromi Miyata, MD. Yuki Kozono, MD. Natsuki Tsuji, MD. Akiko Okuda, MD. – participated to the correction of the manuscript.
11. Kentaro Sekiyama, MD – case supervision, editing.
12. Koichi Terakawa, PhD. – case supervision, checking English.
13. Tadayoshi Nagano, PhD – case supervision.

## Guarantor

1. Tomoatsu Jimi – Corresponding author.
2. Tadayoshi Nagano – The director of our department.

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