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Vaginal Cuff Dehiscence After Endometriosis Surgery

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ABSTRACT

Background and Objectives: Laparoscopic hysterectomy is one of the surgical treatment options for endometriosis. A rare complication of this surgical procedure is vaginal cuff dehiscence, with an incidence of 0.03% to 0.30%. Sexual intercourse may be the main triggering event. It is unclear if patients with endometriosis are more prone to develop vaginal cuff dehiscence than other women undergoing laparoscopic hysterectomy.

Methods: We present the cases of women aged 35 to 46 years who underwent laparoscopic endometriosis surgery. In all patients the vaginal cuff was opened with a high-energy surgical device and closed with an absorbable suture. After 60 to 194 d, the patients developed symptoms including acute abdominal pain and fever shortly after or during coitus and were diagnosed with vaginal cuff dehiscence.

Results: Patients undergoing surgical treatment for endometriosis may experience poor wound healing of the vaginal cuff due to the frequent use of gonadotrophin-releasing hormone analogues before surgery. Contributing to this may be the use of a high-energy surgical device when opening the vaginal cuff. Resuming sexual activities before proper healing of the wound has occurred may then trigger vaginal cuff dehiscence.

Conclusion: Women with endometriosis might be prone to develop vaginal cuff dehiscence, not because of the endometriosis itself but because of a combination of patient-specific factors present in women with endometriosis. Surgeons treating women with endometriosis should be aware of this.

Key Words: Endometriosis, surgery, vaginal cuff dehiscence.

INTRODUCTION

Hysterectomy is one of the most frequently performed gynecologic operations. Endometriosis, the presence of active endometrium-like tissue outside the uterus, is frequently treated by hysterectomy in women in whom all other options did not give symptom relief. A rare complication of this surgical procedure is vaginal cuff dehiscence (VCD). Symptoms of this phenomenon include sudden and severe abdominal pain, dyspareunia, vaginal discharge or bleeding, fever, nausea, and, in severe cases, evisceration of intra-abdominal organs.¹⁻⁴ It requires prompt treatment with either antibiotics or surgical repair.² The incidence is estimated at approximately 0.03% to 0.30%, depending on the operation method: vaginal, abdominal, or laparoscopic approach.^{1,5,6} Laparoscopic surgery has become more common due to advantages such as less blood loss, fewer infections, shorter hospital stay and recovery time, and greater patient satisfaction.^{5,7} Unfortunately, it is reported that the laparoscopic hysterectomy (LH) has a much higher incidence of VCD (1.14%) compared with the transabdominal method (0.10%) or transvaginal method (0.14%).^{4,6} The cause of this striking difference is unknown. Many factors contributing to the occurrence of VCD have been suggested, including opening and closure techniques of the vaginal cuff (VC), suturing materials used, age, body mass index (BMI), the use of medication possibly influencing the healing process, smoking, and menopausal status.^{2,4,5} Sexual intercourse seems to be the triggering event in most cases.^{5,6} However, it is unclear which patients in particular are at risk for developing this serious complication. Endometriosis is a frequent indication to perform a hysterectomy. To date, it is not

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known if patients with endometriosis are more prone to develop VCD than other women undergoing LH because there is no literature available. Here, we present the case of a woman with VCD after endometriosis surgery that occurred in a hospital in the Netherlands. Three additional cases were found by reaching out to gynecologists at 2 other local centers. The complications occurred between February 2016 and June 2018.

CASE PRESENTATIONS

Case 1

A 36-year-old woman without significant medical history except for a laparoscopic ovarian cystectomy 3 years earlier had severe deep endometriosis affecting her rectosigmoid. She had been treated with a gonadotrophin releasing hormone (GnRH) agonist for 9e months, without add-back therapy. Due to pain, she now underwent endometriosis removal surgery. With a laparoscopic approach, the uterus and part of the rectosigmoid were removed. Ultracision on default settings (level 3) was used to open the VC. The procedure was uncomplicated. The VC was closed with an inverting absorbable Vicryl 1–0 suture. The routine postoperative follow-up visit 2 months later revealed no complications. However, 16 d after the follow-up visit, she returned with an acute abdomen and fever a day after having sexual intercourse for the first time since the operation. Physical examination revealed only rebound tenderness, and pelvic examination showed, although being very painful, no sign of VCD. No speculum examination was performed. Because of the fever and elevated infection parameters, she was admitted to the hospital and treated with antibiotics. She was discharged several days later. Over the next month, she kept having abdominal pain not manageable with pain medication. Five months after surgery, she was admitted to the hospital again with fever, nausea, and severe abdominal pain, occurring 1 day after coitus. Physical and vaginal examinations were painful but showed no significant findings. The computed tomography (CT) scan presented intraperitoneal free air. The pelvic examination that followed revealed purulent discharge and a 1-cm partial VCD. She was treated with antibiotics and made a total spontaneous recovery over the next months. No additional surgical repair of the VCD was needed.

Case 2

In a different but very similar case, a 39-year-old woman, without significant medical history other than deep endometriosis, underwent an uncomplicated total LH. In this procedure, unipolar needle electrocoagulation on default

settings (level 4) was used to open the VC. Two years later, a painful mass suspected for endometriosis was found in the VC, suggestive for endometriosis. Treatment with a GnRH analog was given over 6 months, without add-back therapy. Subsequently, in an uncomplicated surgical procedure the VC was opened by unipolar needle electrocoagulation on default settings (level 4) and closed again with a continuous absorbable V-loc 180 barbed suture after the suspected mass was removed. Unfortunately, almost 2 months after surgery, she was admitted to the hospital with severe abdominal pain and vaginal blood loss that started 3 days after having sexual intercourse for the first time since the operation. During examination, a total VCD was revealed. Reoperation consisted of transvaginal closure of the VC with 3 intermittent sutures. She made a total recovery.

Case 3

In another case, a woman aged 35 years with deep endometriosis and adhesions located in the rectovaginal septum was undergoing laparoscopic surgery. Her prior medical history showed a laparoscopic ovarian cystectomy. She was treated with a GnRH agonist for 6 months, without add-back therapy. During surgery, the uterus was removed using electrocoagulation (unipolar needle) to open the VC. In addition, ultracision was used to coagulate bleeding (using auto stop). Although the operation was difficult due to the presence of adhesions, it was uncomplicated. The VC was closed with a V-loc 180 suture. Nine weeks later, she was admitted to the hospital with pain after having sexual intercourse 2 days earlier. Both pelvic and speculum examinations showed a closed VC. Ultrasound revealed an abscess near the right ovary, which was treated with antibiotics. Five months later, the patient presented again with severe abdominal pain, vomiting, and signs of peritonitis after having sexual intercourse. Ultrasound and CT scan showed abdominal free air but were not conclusive about the cause of her symptoms. Therefore, a diagnostic laparoscopy was performed. This showed a VCD and purulent intra-abdominal fluid. A drain was left behind, and treatment with antibiotics was initiated. Two days later, the drain was removed while treatment with antibiotics continued. The next day, the patient was discharged in a satisfactory condition.

Case 4

The fourth case was a woman aged 46 years. She was treated in the same hospital and underwent her third laparoscopy for endometriosis-associated pain. She

smoked 15 cigarettes daily and used no medication. During laparoscopy, the uterus and all endometriosis lesions were removed. In this uncomplicated procedure, the VC was opened with electrocoagulation (unipolar needle) and closed with a V-loc suture. In the 2 months that followed, she presented with nonspecific symptoms such as abdominal pain, nausea, a swollen abdomen, dysuria, obstipation, and elevated inflammation markers (C-reactive protein). No explanation for her symptoms was found, and treatment with antibiotics was initiated. Sixty days after surgery, she presented with abdominal pain and vaginal bleeding, which developed after she described the feeling that something was damaged during sexual intercourse. Speculum examination revealed a small VCD. She did not require additional treatment and made a full spontaneous recovery.

DISCUSSION

In this case series, we describe 4 young women with VCD after laparoscopic surgery for endometriosis. They all had, other than endometriosis, no relevant prior medical history.

Surgery took place in 3 hospitals. In 1 hospital, 2 surgeons performed 1 operation together. In 1 hospital, 1 surgeon performed the operation on 1 patient. And in another hospital, 2 cases occurred, operated on by the same surgeon. All surgical procedures were uncomplicated and were carried out by gynecological surgeons who performed LH on a regular basis. In all patients, the vaginal cuff was opened during surgery. In 3 patients, it was opened in the procedure in which the uterus was removed, and in 1 patient who underwent an LH 2 years earlier, the vaginal cuff was reopened 2 years later in order to remove a newly developed endometriosis lesion in the vaginal top. All patients had a BMI of < 30, 1 patient smoked, and 3 patients took a GnRH agonist before surgery, without add-back therapy. In 3 patients, a running stitch was used to close the VC, and in 1 patient, intermittent sutures were used. Unfortunately, there was no information about suturing depth or distance between suture placement (see **Table 1** for an overview of the patients' characteristics).

Importantly, in all operations a high-energy surgical device was used to open the vaginal cuff. With this tool,

Table 1.
Patient Characteristics in Relationship to Vaginal Cuff Dehiscence

	Patient 1	Patient 2	Patient 3	Patient 4
Age, yr	36	39	35	46
BMI, kg/m ²	27	28	21	22
Smoking	–	–	–	+
Use of GnRH analog	+	+	+	–
Duration of GnRH analog, mo therapy	9 months	6 months	6 months	N/A
Use of add-back therapy	–	–	–	N/A
ASRM stage	IV	IV	IV	IV
Surgical procedure	LH and right ovariectomy + endometriosis removal including recto-sigmoid resection	Endometriosis removal from the vaginal top after earlier LH	LH + endometriosis removal from the rectovaginal septum	LH + endometriosis removal
Method of opening the VCD	Ultracision (level 3)	Unipolar needle electro coagulation (level 4)	Unipolar needle electro coagulation (level unknown)	Unipolar needle electro coagulation (level unknown)
Suture for vaginal cuff	Inverting absorbable Vicryl 1–0 (intermittent stitches)	V-loc 180 (running stitch)	V-loc 180 (running stitch)	V-loc 180 (running stitch)
Time to vaginal cuff dehiscence, d	73	85	194	60
Time from coitus to vaginal cuff dehiscence, d	1	2	2	During coitus

ASRM, American Society for Reproductive Medicine; BMI, body mass index; GnRH, gonadotrophin-releasing hormone; N/A, not applicable; VCD, vaginal cuff dehiscence.

complete hemostasis is easily obtained. However, due to thermal damage of the tissue, the healing process might be negatively influenced by lack of blood flow because of frequent use of the power source during the circumference of the VC.⁶ Although 1 article argues that this is due to the surgical method than to the use of electrosurgery,⁷ it seems likely that abundant use of electrosurgery might be negatively influencing wound healing. Unfortunately, we were unable to recover information about the duration of the application of the heat source.

Furthermore, all vaginal cuffs were closed with an absorbable suture, which, when absorbed before healing of the wound has occurred, may lead to VCD. The time between hysterectomy and occurrence of VCD in 3 of 4 patients was within 90 d after surgery, which is in line with the literature (21 to 91 d).^{1,2,4,6} It is worth noting that the V-loc 180 suture has a tensile strength of 80% after 7 d to 65% after 21 d.⁸ The suture is totally absorbed after 180 d. This is far after most cuff dehiscence occurred in our report.

One other interesting observation can be made as well. All patients had coitus during or shortly before developing symptoms. This is in line with the literature that sexual intercourse seems to be the main triggering event.^{1,2,4-6} Three patients had coitus within 60 d post-surgery. This is in contrast with older patients, in whom the dehiscence often has a late onset and is considered a spontaneous event.² In younger patients, it is seen in association with early resumption of intercourse in relation to incomplete VC healing. Laparoscopy may contribute to this phenomenon, as patients can often resume daily activities much earlier than after laparotomy.^{1,3} In order to prevent VCD, it could be wise to suggest a “no coitus period” postsurgery in patients undergoing an LH or any other laparoscopic surgical procedure leading to the opening of the VC. There is no clear indication when it is safe to resume sexual activities. A minimum of 3 months has been suggested⁶ but should probably be even longer in patients with poor wound healing or vaginal atrophy, such as women using GnRH analogs, which are frequently used by patients with endometriosis before surgery. The use of GnRH analogs has a detrimental effect on wound healing.⁹ This effect is mostly due to lower blood levels of estrogen, which in turn lead to a decrease in the collagen content, protease inhibitors, and other factors important to wound healing.⁹ Furthermore, low estrogen blood levels lead to vaginal atrophy and, more importantly, a decrease in vaginal blood flow,¹⁰ which may also negatively influence wound healing. Therefore, we

believe that patients using GnRH agonists may be more prone to develop VCD.

CONCLUSION

Women with endometriosis might be prone to develop VCD, not because of the presence of endometriosis itself but rather due to a combination of patient-specific factors in this particular population. These factors include vaginal atrophy due to the frequent use of GnRH analogs before surgery that negatively influence wound healing and the use of a high-energy surgical device when opening the VC. Early resumption of sexual intercourse before proper healing of the wound has occurred seems to be the main triggering event. Surgeons treating women with endometriosis should be aware of this. Larger studies are necessary in order to identify more factors contributing to the occurrence of this rare complication.

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