

Cervical stump necrosis after laparoscopic supracervical hysterectomy: successful management by laparoscopic approach

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Abstract

Persistent bleeding from the remaining cervix after laparoscopic supracervical hysterectomy (LSH) is normally related to the presence of residual functioning endometrial tissue. However, postoperative significant vaginal hemorrhage caused by cervical necrosis following LSH is relatively rare. A 39-year-old nulligravida was admitted to the emergency department with hypovolemic shock after LSH performed in another hospital for treatment of uterine fibroids 18 days previously. Following hemodynamic stabilization and mechanical tamponade of the bleeding uterine cervix, laparoscopic simple trachelectomy was carried out and antibiotics were administered. The patient developed no surgical or clinical complications and was discharged 4 days after surgery. Histologic examination revealed extensive areas of tissue necrosis and no signs of malignancy. Stump necrosis and accompanying bleeding are rare but serious complications of LSH. Infection is an important component of this entity and should be treated. Endoscopic management of this condition appears to be feasible and safe.

Keywords

Case report, cervical stump necrosis, laparoscopic supracervical hysterectomy, laparoscopic treatment, massive delayed vaginal bleeding, hypovolemic shock

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Introduction

Endoscopic techniques have progressively gained popularity in gynecologic surgery during the past few decades.¹ There has been a significant shift from open surgery toward laparoscopy for many types of surgery, including oncological operations.² Complicated procedures such as removal of very large myomas or even cytoreduction in cases of advanced-stage ovarian cancer, which were once strict indications for laparotomy, can now be successfully performed by a laparoscopic approach.³⁻⁵

Laparoscopic surgery has fewer complications and more rapid recovery than the abdominal approach.⁶ For example, laparoscopic supracervical hysterectomy (LSH) is considered a suitable and safe therapeutic option for diverse benign uterine diseases. The rapid expansion of this technique has also brought to light important drawbacks specifically related to this procedure, such as concerns related to unprotected intracorporeal morcellation, obligatory continuation of cervical cancer screening of the remaining stump, and cyclical bleeding from the remaining cervix. More recently, these concerns have significantly contributed to dampening of patients' and surgeons' enthusiasm for LSH.^{7,8} Among the possible postoperative complications, persistent bleeding is certainly both the most frequently observed and the most concerning. Correct diagnosis of the cause of bleeding is essential to guide appropriate therapy. We herein present a case of significant vaginal hemorrhage after LSH caused by cervical necrosis. This complication has been seldom reported in the literature to date. The present report discusses its pathophysiology and emphasizes the treatment implications, especially the possibility of endoscopic management.

Case report

A healthy 39-year-old Caucasian nulligravida was admitted to the emergency department of the Asklepios Hospital in Hamburg with significant vaginal bleeding and hemodynamic instability. She had undergone LSH 18 days previously for treatment of symptomatic myomas at another hospital. A preoperative workup, including cervical cytology and endometrial biopsy, had indicated no signs of malignancy. Her medical history was unremarkable. Final histologic examination had confirmed the benign nature of the fibroids and the absence of endometrial pathology.

On admission, the patient had a body temperature of 37°C, elevated pulse rate (118 beats/minute), and low blood pressure (70/55 mmHg). Emergent laboratory indices were markedly altered (hemoglobin, 7.7 g/L; white blood cells, 14.2×10^9 /L; platelets, 180,000/ μ L; and C-reactive protein, 13.7 mg/L); however, her coagulation test results were within normal limits. Vaginal examination revealed two actively bleeding ulcerative lesions measuring approximately 1 cm in greatest diameter located at the 1- and 5-o'clock positions, respectively, in the remaining uterine cervix (Figure 1). The adnexa and parametrial regions were clinically unremarkable. Transvaginal ultrasonography indicated no signs of free peritoneal fluid, a hematoma, or an adnexal mass. The residual cervix was approximately 3 cm in length.

The initial possible diagnosis was hypovolemic shock due to bleeding from a previously undetected malignant cervical lesion. The lesion was vigorously tamponed, and intravenous fluid was administered to establish hemodynamic stability, including saline solution and transfusion of 2 units of erythrocyte concentrate. After 24 hours of clinical observation, the vaginal tampon was removed. However, the patient again developed significant

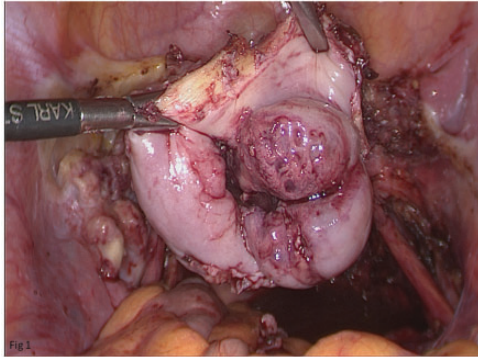


Figure 1. Frontal view of the uterine cervix showing two major ulcerative lesions at 1 and 5 o'clock.

hemorrhage. After a detailed discussion of the situation with the patient and an explanation of the different treatment options, laparoscopy was planned and written consent for the treatment was obtained from the patient.

At the beginning of surgery, preventive bilateral ureteral stents were cystoscopically placed, and several biopsies of the cervical lesions were performed and sent for frozen section. Intraoperative pathologic examination showed only areas of tissue necrosis with no signs of malignancy. During laparoscopy, multiple peritoneal and intestinal adhesions in the region of the cervical stump were observed. Initially, the pelvic retroperitoneum was bilaterally accessed, and rapid identification of the hypogastric arteries with isolation and selective coagulation/clipping of the uterine arteries at their origin was carried out. Based on the results of the frozen section analysis, the decision was made to perform laparoscopic simple trachelectomy. After massive adhesiolysis, both ureters were dissected up to the level of the bladder, the posterior cul-de-sac was liberated, and the vesicovaginal space was prepared, allowing complete exposure of the remaining cervix (Figure 2). Although the cervical tissue

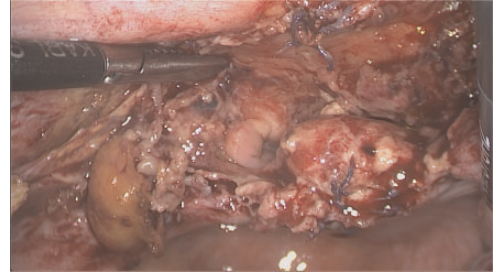


Figure 2. Laparoscopic aspect of the necrotic cervical stump after massive adhesiolysis. The vaginal examination showed that the cervix was intact. During stump excision, however, the vagina was exposed, probably because of tissue necrosis and infection.

was in an extremely vulnerable condition, it was completely removed with no complications. The vaginal cuff was laparoscopically closed with interrupted polydioxanone-0 sutures (Figure 3). The surgical specimens were sent for microbiologic and pathologic analysis. Extensive lavage of the peritoneal cavity was performed, and a drain was placed. The patient developed no surgical or clinical complications; broad-spectrum antibiotics (cefuroxime and metronidazole) were administered therapeutically for 7 days, and the patient was discharged in excellent clinical condition after 4 days of hospitalization. Microbiologic culture isolated no pathologic agent, and histologic examination confirmed only extensive tissue necrosis with no evidence of neoplasia. Routine visits on postoperative days 14 and 30 were unremarkable, and the patient had no complaints. The double-J catheters were removed 2 weeks later without difficulty.

Discussion

The decision to remove or retain the cervical tissue in the management of apparently benign uterine conditions is a matter of controversy among specialists worldwide.



Figure 3. Final appearance of the operative site after laparoscopic trachelectomy.

It is believed that women undergoing LSH may have less operative morbidity and better outcomes, mainly with respect to potential sexual and pelvic floor dysfunction.⁹ Although these positive expectations have not been scientifically confirmed in prospective studies,⁷ the ability to execute supracervical procedures has certainly contributed to the shift toward endoscopic hysterectomy techniques that has been observed in many Western countries during the past decade.¹⁰ One of the most common complications associated with supracervical hysterectomy is bleeding from the cervical stump, which may occur in up to 25% of cases.¹¹ The range of cervical bleeding is broad and usually consists of a persistent low amount of bleeding caused by remaining functional endometrial tissue in the cervical stump. Other rare complications are bleeding secondary to tissue necrosis, infection, and seldom malignancy. In such cases, other important etiologies of postoperative bleeding are frequently disregarded. Occult neoplasia and necrosis of the remaining uterine cervix are also important differential diagnoses. Achieving the correct diagnosis is crucial to arrange appropriate management mainly with regard to oncologic therapy. Early studies showed a <0.03% risk of developing malignancy in the remaining cervical stump in women with previously normal cervical cytology.¹² In a recent multicenter retrospective study,

three (0.33%) cases of cervical stump carcinoma were identified among 903 patients with cervical cancer during a 10-year period, and all of these patients were diagnosed several years after supracervical hysterectomy.¹³ Therefore, patients with a history of subtotal hysterectomy should undergo routine cervical cancer screening. Moreover, it is important to rule out any possible occult malignancy before subtotal hysterectomy. When trachelectomy is required after subtotal hysterectomy, malignancy should also be excluded; otherwise, radical trachelectomy would be performed.

Cervical necrosis after LSH is a cause of significant genital hemorrhage, but this complication has been rarely reported to date. To the best of our knowledge, the present report is only the third publication to specifically address this topic^{8,14,15} and the only reported case of using a laparoscopic approach in this scenario (Table 1). Microscopically, progression of necrosis could cause gradual erosion of the capillaries and vessel walls, which would ultimately lead to severe bleeding. Under these circumstances, the association of local ischemia and infection results in decidual necrosis. There are probably two main factors related to tissue necrosis in these cases:^{11,16} coagulation and cutting of ascendant branches of the uterine vessels and rigorous bipolar coagulation of the cervical canal to avoid monthly bleeding. All these factors, either alone or in combination, may cause significant damage to the blood supply and perfusion of the remaining cervical stump, which may result in decidual necrosis. In our case, the patient had previously undergone an operation in another hospital and was referred to our unit with bleeding. We do not know the intraoperative setting and other details of the initial scenario, but we can hypothesize that coagulation of ascendant branches of the uterine vessels along with possible rigorous bipolar coagulation of the cervical canal could have contributed

Table 1. Previous reports of cervical necrosis and significant genital hemorrhage after laparoscopic supracervical hysterectomy.

Authors	Publication year	Patient age (years)	Indication for surgery	Route of first surgery	Time to complication	Management	Type of salvage treatment/surgery	Days of recovery	Recovery	Outcome	Pathology
Holloran-Schwartz et al. ¹⁶	2012	44	Fibroid	Laparoscopy	15 days	Vaginal	Deep figure-eight sutures placed vaginally in cervix at lateral aspects of internal os under general anesthesia	1	Uneventful	EBL of 1000 mL	N/A
Huang et al. ¹³	2005	38	Menometrorrhagia a intractable to medical treatment, fibroids	Laparoscopy	2 weeks	Laparotomy	Simple trachelectomy with laparotomy, IV fluids, and transfusions of packed RBC	24	Postoperative abscess formation	Postoperative persistent fever, pleural effusion, and abscess collections that resolved with IV antibiotics	Acute cervicitis with ischemic hemorrhagic necrosis and vascular thrombosis
Pereira et al. ¹⁷	2015	29	Dysmenorrhea and pelvic pain refractory to multiple medical modalities	Laparoscopy	8 weeks	Vaginal	Vaginal trachelectomy	N/A	Uneventful	Uneventful	Signs of chronic cervicitis, arteriovenous malformation by elastic staining
Present case	2021	39	Symptomatic fibroids	Laparoscopy	18 days	Laparoscopy	Laparoscopic excision of remaining stump	4	Uneventful	Uneventful	Extensive tissue necrosis and evidence of neoplasia

RBC, red blood cells; EBL, estimated blood loss; IV, intravenous; N/A, not available.

to this complication. Bipolar coagulation triggers a more intense inflammatory cascade and causes increased production of the cytokines responsible for tissue damage compared with the use of a cold knife.¹⁶ Thus, it is reasonable to recommend very cautious use of energy devices during LSH to reduce the risk of this sort of complication. We should also emphasize that this case report does not underestimate the effectiveness of routine practices such as reasonable bipolar coagulation of the remaining endometrial tissue within the remaining cervix to avoid potential persistent bleeding, which has been reported up to 25% of cases.¹²

The mechanism of operative-site infection after hysterectomy is based on ascending dissemination of polymicrobial microorganisms from the upper vagina and endocervix to the cervical stump or vaginal cuff and to paravaginal tissues.¹⁷ The presence of greatly damaged residual cervical tissue produced by impairment of the microvascularization and consequent ischemia and acidosis significantly increases the risk of severe pelvic infections, including septic shock. In the present case, the high risk of contamination was the main reason for organ removal and administration of antibiotics for a relatively long period rather than vascular control alone, despite the absence of positive microbiology and unequivocal clinical or laboratory signs of infection.

Complete excision of the necrotic cervical stump is the therapy of choice for this condition. Alternative methods such as vascular embolization must be carefully performed with close monitoring, primarily because of the elevated risk of severe infection.¹⁸ The present report also highlights the feasibility and safety of laparoscopy in the management of this condition. Endoscopy permits rapid vascular control of the reproductive organs by isolation and ligation of the hypogastric and uterine arteries and execution of simple trachelectomy even in difficult

scenarios, as demonstrated herein. The preventive placement of ureter stents, careful closure of the vaginal vault, and administration of antibiotics are crucial to produce optimal operative outcomes.

In summary, the present report provides new insights regarding a rare but serious complication related to a widely performed procedure (LSH). In fact, coagulation and cutting of ascendant branches of the uterine vessels as well as extensive use of cautery leading to ischemia of the cervical stump and ascending infection could play a central role in the pathophysiology of this condition. Complete laparoscopic removal of the remaining necrotic uterine cervix in combination with broad-spectrum antibiotics seems to be an optimal and safe therapeutic strategy.

Ethical considerations

The local Institutional Board Review approved this case study. Written informed consent for treatment and for publication of this case report was obtained from the patient. The report complied with relevant CARE guidelines for case reports.⁹

Declaration of conflicting interest

The authors declare that there is no conflict of interest.

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