



Vaginal cuff closure technique and the risk for infected pelvic hematoma after vaginal hysterectomy



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ABSTRACT

Objectives: Infected pelvic hematoma is a relatively common complication of vaginal hysterectomy, manifesting with postoperative pain and fever which often necessitate surgical drainage. We aimed to assess the effect of the surgical technique for vaginal cuff closure on the incidence of this complication. **Study design:** Until March 31, 2010, our surgical protocol for vaginal hysterectomy included complete vaginal cuff closure. After this date, all surgeries were performed using another technique, by which a patent tract was left at the vaginal cuff for drainage of blood, secretions and debris. We reviewed medical records of all women who underwent vaginal hysterectomy for pelvic organ prolapse in our institution between January 2006 and November 2015, including demographic, clinical and surgical data. We compared the incidence of postoperative infected pelvic hematomas before and after March 31, 2010. **Results:** We identified 325 women who underwent vaginal hysterectomy during the first time period (group I) and 243 women who underwent this procedure during the second time period (group II). While demographic and clinical data were not significantly different between the two groups, the incidence of infected pelvic hematomas necessitating hospitalization was significantly lower in group II (3.8% vs. 13.5%, $p < 0.0001$).

Conclusions: A significant reduction in the incidence of infected pelvic hematoma following vaginal hysterectomy was noted using a surgical technique that allows for drainage of blood and debris through the vaginal cuff.

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Introduction

Hysterectomy is one of the most commonly performed gynecological surgeries, which can be carried out via a vaginal, abdominal or a laparoscopic approach. The vaginal route is chosen in about 20% of the cases in the United States and is the preferred route of surgery for women with pelvic organ prolapse [1,2]. This route has the advantage of faster recovery, fewer complications, shorter hospital stay and reduced costs in comparison to the abdominal route [3,4]. Complications of the vaginal route include: urinary incontinence, bladder and ureteral injury, urinary retention, bowel injury, hemorrhage and infection [5]. One of the complications associated with vaginal hysterectomy is the formation of an infected pelvic hematoma manifesting as abdominal pain, fever and a foul smelling discharge. These hematomas can be

diagnosed sonographically and require treatment ranging from pain control and antibiotics to surgical drainage. While the incidence of pelvic hematomas in general (infected and non-infected) varies between 25% and 98% [6], the incidence of infected hematomas is estimated to be around 6–9%. In a cohort of patients from our institution undergoing vaginal hysterectomy from 2006 to 2009, nine percent were diagnosed with an infected pelvic hematoma necessitating surgical drainage [7]. Most hematomas were in the vaginal vault or anterior vaginal wall. They were all extra-peritoneal and amenable to transvaginal drainage without entering the peritoneal cavity.

The preferable surgical technique for vaginal cuff closure after vaginal hysterectomy, and its effect on postoperative pelvic hematoma formation, has not yet been appropriately addressed (Medline search of the English literature from 1966 until March 2014, using the terms: 'vaginal cuff'; 'closure'; 'technique'; 'surgery' and 'hematoma'). Until March 31, 2010, the surgical protocol for vaginal cuff closure in our institution included complete closure of the vaginal mucosa leaving no tract for drainage from the vaginal

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vault to the vaginal cavity. From April 1st 2010 and on, we changed the surgical protocol for vaginal cuff closure, so that the vaginal mucosa was only partially closed, leaving a tract of about 2×2 cm for drainage of blood and debris at the center of the vaginal cuff. We assumed that leaving a tract for drainage from the vaginal vault into the vaginal cavity would decrease the incidence of infected pelvic hematomas. The aim of this study was to compare the incidence of infected pelvic hematomas between the two time periods and thereby determine the effect of vaginal cuff closure technique on the incidence of infected pelvic hematomas after vaginal hysterectomy.

Materials and methods

Until March 31, 2010 the surgical protocol for vaginal cuff closure after vaginal hysterectomy in our institution included complete closure of the vaginal mucosa using a running locked absorbable suture (Fig. 1). After this date, the surgical protocol for cuff closure was changed so that mucosal edges were only partially closed, leaving a patent tract in between them. This technique aimed to allow for drainage of blood and debris through the vaginal cuff into the vaginal cavity. A running locked suture was placed on each of the incisional edges separately in order to ensure prolonged patency of the tract (Fig. 2).

We reviewed medical records of all women who underwent vaginal hysterectomy for pelvic organ prolapse in our institution between January 2006 and November 2015. We obtained demographic, clinical and surgical data from all patients and compared the incidence of postoperative infected pelvic hematomas among patients undergoing surgery before (group I) and after (group II) March 31, 2010. Infected hematoma was defined as a sonographically proven pelvic hematoma accompanied by fever and/or pelvic pain requiring hospitalization [6,7]. Patients who underwent laparoscopic intervention or colposcleisis and those who underwent vaginal hysterectomy for other indications apart from pelvic organ prolapse were excluded from the study. Statistical analysis was performed using IBM statistics (SPSS) version 22. We used Chi square test for comparing categorical variables and independent t-test or Mann Whitney U test as appropriate, for comparing continuous variables. A p

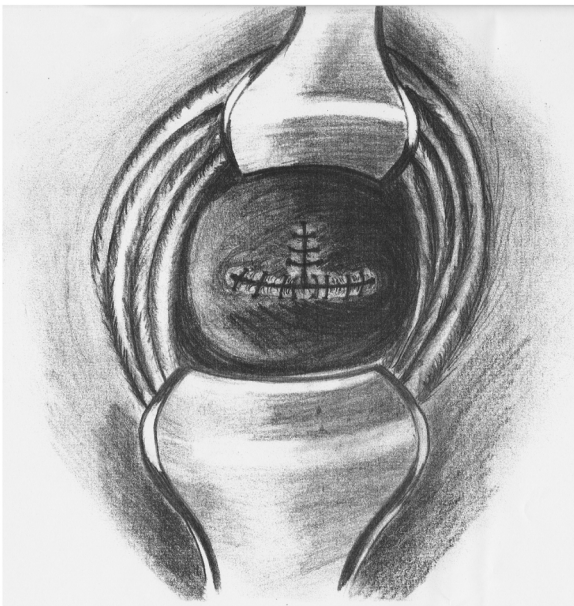


Fig. 1. Illustration of the vaginal cuff (per speculum view) after vaginal hysterectomy with complete vaginal cuff closure (patients in group I).

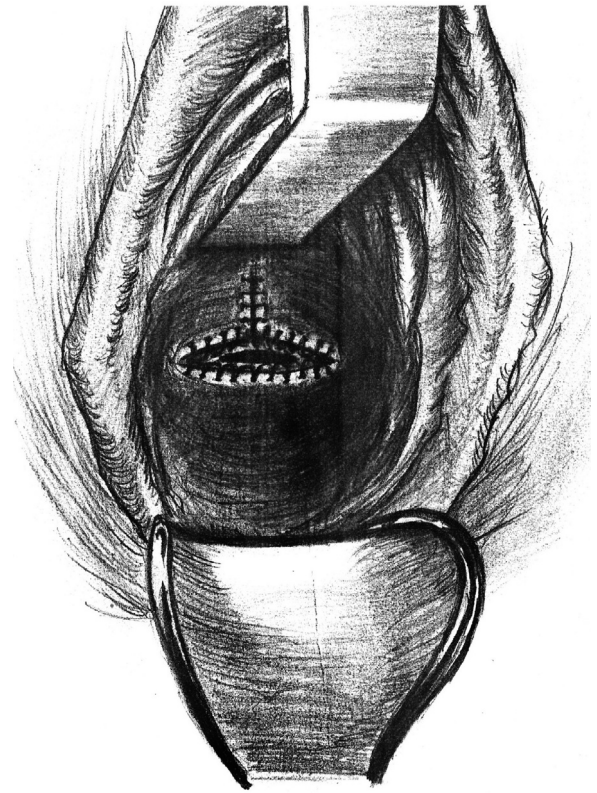


Fig. 2. Illustration of the vaginal cuff (per speculum view) after vaginal hysterectomy, leaving a patent tract for drainage of blood and debris (patients in group II).

value <0.05 was considered statistically significant for all comparisons. The study was approved by the Institutional Review Board Committee for Human Subjects.

Results

We identified 325 women who underwent vaginal hysterectomy during the first time period (group I) and 243 women who underwent vaginal hysterectomy during the second time period (group II). All surgeries were performed or supervised by the same, fellowship trained, urogynecologist (YA). All women received antibiotic prophylaxis perioperatively and vaginal packing postoperatively as part of our protocol for pelvic reconstructive procedures. The two groups did not differ with regards to menopausal status, parity and perioperative blood loss (as indicated by the postoperative drop in hemoglobin concentration) (Table 1). Patients from group II were more likely to undergo concomitant TVT procedures (66% vs. 40%, $p < 0.0001$), to have the anterior vaginal wall repaired using a mesh (14.9% vs. 0.6%, $p = 0.01$), and to have a posterior vaginal wall repair (74% vs. 60.3% $p < 0.0001$). Hospital stay was significantly shorter in group II (3.19 ± 1.03 vs. 3.75 ± 2.18 days, $p < 0.0001$). The incidence of infected pelvic hematoma necessitating hospitalization was also significantly lower in group II (3.8% vs. 13.5%, $p < 0.0001$). Surgical drainage of an infected hematoma was performed in 3.7% of patients from group I as compared to 1.2% of patients from group II ($p = 0.07$). Demographic, clinical, and surgical characteristics of patients who developed infected pelvic hematoma did not differ significantly from those who did not develop this complication (Table 2). However, patients who developed an infected pelvic hematoma were more likely to have had a previous cesarean section and to require a longer postoperative hospital stay

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