DOI: https://doi.org/10.5114/pm.2024.136011

Menopause Rev 2024; 23(1): 53-56

REVIEW PAPER

Unveiling the uncommon: vault hematoma and vault cellulitis following hysterectomy – a comprehensive narrative review

Ipsita Mohapatra, Subha Ranjan Samantaray

All India Institute of Medical Sciences, Kalyani, India

Abstract

Hysterectomy is a common surgical procedure performed to remove the uterus. This is considered as a clean-contaminated surgical procedure. It is a safe procedure, but major and minor complications can occur, including vault hematoma and vault cellulitis, which are specific to the surgical site. Vault hematoma is the accumulation of blood within the vaginal vault, while vault cellulitis is an infection of the vaginal vault or the surgical cuff following a hysterectomy. Vault hematoma may be caused by trauma during surgery, improper hemostasis or infection. Smaller hematomas may resolve with conservative management, but larger vault hematomas and infected hematomas may need surgical drainage and antibiotic coverage. Vault cellulitis typically occurs due to the introduction of bacteria into the surgical site which may occur due to inappropriate postoperative care and contaminated materials. The patient may present with pelvic pain and fever. Broad-spectrum antibiotics are typically prescribed to treat the infection. While both these complications are relatively rare and appear to be mild, healthcare providers should be vigilant in recognizing and managing them promptly to prevent adverse outcomes. Prophylactic antibiotics should be administered before the surgery to reduce the risk of infection. Care should be taken to minimize tissue trauma, ensure proper hemostasis, and maintain strict aseptic techniques during surgery.

Key words: vault hematoma, vault cellulitis, hysterectomy.

Introduction

Hysterectomy is a common surgical procedure performed to remove the uterus, and it may be done for various medical reasons, including leiomyomas, endometriosis, uterine prolapse, or gynecological cancers. Hysterectomy can be performed through abdominal, vaginal, laparoscopic, robotic assisted laparoscopic or vaginal natural orifice transluminal endoscopic surgery [1]. The vaginal route and laparoscopic routes of hysterectomy are preferred due to lower invasiveness, but in the case of emergencies and a large uterus, the abdominal route is the usual approach. Hysterectomy is considered as a clean-contaminated surgical procedure. While it is generally considered a safe procedure, major and minor complications can occur, including vault hematoma and vault cellulitis, which are specific to the surgical site. The other potential complications which may occur usually within the first postoperative month are hemorrhage, thromboembolism, urinary and/or intestinal tract injury, nerve injury and vaginal cuff dehiscence.

Vault hematoma is the accumulation of blood within the vaginal vault, which is the space left behind after the removal of the uterus. It typically presents with symptoms such as pelvic pain, pressure, and sometimes vaginal bleeding. The risk factors for vault hematoma include extensive vaginal dissection during surgery, coagulopathy, or the use of anticoagulant medications. Management of vault hematoma usually involves conservative measures such as bed rest, pain management, and monitoring for any signs of infection. In some cases, drainage may be required if the hematoma is large or causing significant symptoms.

Vault cellulitis, on the other hand, is an infection of the vaginal vault or the surgical cuff following a hysterectomy. It can occur due to contamination during surgery or secondary to an ascending infection from the lower genital tract. Patients with vault cellulitis often present with symptoms such as pelvic pain, fever, vaginal discharge, and sometimes systemic signs of infection. Treatment of vault cellulitis involves antibiotic therapy. In severe cases, hospitalization and intravenous antibiotics may be necessary.

In this review we will discuss these two unusual complications of hysterectomy.

Vault hematoma

Vault hematoma is the accumulation of blood in the area where the uterus was present, commonly known as the vaginal vault, after a hysterectomy. Post-hysterec-

Corresponding author:
Ipsita Mohapatra, MBBS, MD, All India Institute of Medical Sciences, Kalyani, India,
e-mail: demurerosy@gmail.com

Submitted: 12.01.2024
Accepted: 19.02.2024

tomy vault hematomas are not uncommon. The incidence of pelvic hematomas in general (infected and non-infected) varies between 25% and 98% [2]. The incidence of infected hematomas is estimated to be around 6–9% [2, 3]. The vaginal route of hysterectomy is associated with higher incidence of vault hematomas than abdominal hysterectomies [4]. Vault hematomas can be formed in the pouch of Douglas, subvesical space, ischio-rectal fossa and broad ligament [5]. It can be a complication of the surgery and sometimes it may be very troublesome. The size of the hematoma has been associated with the rate of vault hematoma being infected [6].

Causes

1. Surgical trauma: one of the primary causes of postoperative vault hematoma is surgical trauma during the hysterectomy. Damage to blood vessels in the area can lead to bleeding and hematoma formation, mostly after the effect of anaesthesia is over. Extensive dissection during hysterectomy may lead to bleeding after the effect of anaesthesia decreases, leading to vault hematoma formation.
2. Improper hemostasis: if the bleeding is not adequately controlled during the procedure, it can result in the formation of a hematoma.
3. Infection: infection at the surgical site can cause inflammation and bleeding, potentially leading to hematoma formation.

Symptoms

Vaginal bleeding, which may be continuous or intermittent, is the most common symptom of vault hematoma. Postoperative discomfort, abdominal distension, paralytic ileus, continuous fever, foul smelling discharge *per vaginum*, abscess formation, tenesmus, nausea, vomiting, and diarrhea are some other presenting symptoms of vault hematoma [6]. Some patients may experience pelvic or lower abdominal pain. A few patients may complain of swelling or a feeling of fullness in the vaginal area. If the hematoma becomes infected, patients may experience a rise in temperature and other symptoms of inflammation.

Prevention

Preventing a vault hematoma is mainly the responsibility of the operating surgeon, and it involves proper surgical techniques. Every caution should be taken to ensure proper hemostasis. Ensuring that all blood vessels are properly ligated or cauterized will lead to minimizing bleeding and hence preventing vault hematoma formation. At the same time, reducing the risk of postoperative infection is also crucial. Prophylactic antibiotics may be administered before surgery to decrease the chance of postoperative infection. Careful dissection, refinement of surgical techniques and tissue handling during surgery can also help prevent trauma to blood vessels [7]. A proper check of attaining complete hemostasis before closure should be practiced. Some surgeons prefer to use ethamsylate (250 mg in 2 ml) and botropase intramuscular injections in cases of hysterectomy where excessive oozing was present [8]. Tight vaginal packing in cases of vaginal hysterectomies has also been attempted to prevent postoperative vault hematoma.

Diagnosis

For the diagnosis of vault hematoma, ultrasonography is preferred [9]. About 10% of vault hematomas can be elicited by digital examination [10]. For the purpose of studying the incidence of vault hematoma after vaginal hysterectomy, Dane *et al*. categorized the cases into small hematoma < 5 cm and large hematoma > 5 cm [6]. Out of 103 patients who underwent vaginal hysterectomy, 20 women had vault hematoma, 70% had small hematoma and 30% had large hematoma which was diagnosed by transabdominal ultrasonography.

Treatment

Even after taking all preventive measures, sometimes vault hematoma may occur. Small hematomas may resolve on their own, but close monitoring is necessary to ensure that the bleeding has stopped and there is no increase in the size of the hematoma. However, in some cases, especially if the hematoma is large or causing significant discomfort, drainage may be required. Removal of vaginal cuff stitches, ultrasound-guided percutaneous and transvaginal drainage and a computed tomography percutaneous guided approach have all been considered as treatment options for drainage and treatment of vault hematoma [11]. Pain relief medications and antibiotics may be prescribed as needed. In severe cases, it may be necessary to go back into the surgical site to address the hematoma, control any bleeding, and remove the accumulated blood.

Vault cellulitis

Vault cellulitis is an infection that can occur at the vault after a hysterectomy. It is characterized by inflammation of the tissue in the vaginal vault, which is the space left after the removal of the uterus. Like any infection, vault cellulitis can be a serious condition that requires medical attention. Most of these infections are caused by anaerobic bacteria [4]. Hysterectomy is associated with increased risk of vault cellulitis

as the vaginal flora cannot be completely eliminated before the surgical procedure.

Causes

Vault cellulitis typically occurs due to the introduction of bacteria into the surgical site. The following factors can contribute to its development:

Surgical complications: inadequate sterilization of surgical instruments or poor surgical technique can introduce bacteria into the surgical site. Inadequate sterilization of the operative area, especially in cases of vaginal hysterectomy, can lead to higher risk of infection at the vault [12]. *Enterococcus faecalis* is the most commonly isolated pathogen which is associated with vault cellulitis and is resistant to routine empirical antibiotic prophylaxis [13].

Inadequate postoperative care: poor postoperative wound care, hygiene, or lack of antibiotic prophylaxis can also contribute to infection. During the total hysterectomy, the peritoneal cavity is exposed to the vagina for a temporary period, and in the case of inadequate pre-operative prophylaxis or sterilization, there is higher risk of vault infection postoperatively.

Contaminated materials: the use of contaminated surgical materials or dressings can introduce pathogens into the surgical site.

Risk factors for postoperative pelvic infections: systemic diseases, any cause of decreased immunity, prolonged time of surgical procedure, pelvic adhesions and prolonged hospital stay.

Prevention

Proper sterilization: all surgical instruments and materials should be properly cleaned and sterilized. A cohort study observed higher postoperative infection rates for women who underwent vaginal cleansing with only saline compared to use of chlorhexidine prior to vaginal hysterectomy [14]. Iodine-based solution has to be routinely used for vaginal cleansing before the operative procedure.

Antibiotics: prophylactic antibiotics are often administered before surgery to reduce the risk of infection. A single dose of first generation cephalosporins is recommended 30 minutes prior to surgery [15]. In the case of a prolonged surgical procedure a second dose of antibiotics may be administered taking the half-life of the antibiotic into consideration. Postoperatively, antibiotics for protecting against gram-positive and gram-negative bacteria have to be given for 5–7 days.

Wound care: maintaining good postoperative wound care and hygiene is crucial for prevention of vault cellulitis.

Prompt treatment of infection: early detection and treatment of any signs of infection can help prevent the condition from worsening. The treatment should be tailored to the responsible pathogens, which may include gram-negative and gram-positive bacteria, as well as anaerobes.

Symptoms

Often, a low-grade fever is the earliest sign of infection. Toglia *et al*. found in their study that 69% of women with postoperative pelvic collection experienced febrile morbidity compared to 12% of those with no collection [16]. The other symptom of vault cellulitis may be foul-smelling vaginal discharge. The discharge may be scanty or profuse, and sometimes may be blood tinged. Pain and tenderness in the pelvic area may be experienced due to the infection. Some patients may also present with swelling and redness in the vaginal vault area.

Treatment

Broad-spectrum antibiotics are typically prescribed to treat the infection. The choice of antibiotics may be adjusted based on the results of culture and sensitivity testing. Pain relief medications may be recommended to manage discomfort. In severe cases or when there is an abscess, drainage of pus or fluid may be necessary. If the infection is severe or if the patient has other health complications, hospitalization may be required for drainage, intravenous antibiotics and close monitoring.

Conclusion

Preventing vault hematoma and cellulitis after hysterectomy is essential. Care should be taken to minimize tissue trauma, ensure proper hemostasis, and maintain strict aseptic techniques during surgery. Prophylactic antibiotics are often administered before the surgery to reduce the risk of infection.

While these complications are relatively rare and appear to be mild, healthcare providers should be vigilant in recognizing and managing them promptly to prevent adverse outcomes. Preoperative evaluation of risk factors and adherence to best practices during surgery can help in reducing the incidence of these complications, enhancing patient outcomes and satisfaction.

Disclosure

The authors report no conflict of interest.

References

1. Giannini A, D'Oria O, Bogani G, et al. Hysterectomy: let's step up the ladder of evidence to look over the horizon. J Clin Med 2022; 11: 6940.

2. Kuhn RJP, de Crespigny LC. Vault haematoma after vaginal hysterectomy: an invariable sequel? Aust N Z J Obst Gynaecol 1985; 25: 59-62.
3. Segev Y, Auslender R, Lissak A, Lavie O, Abramov Y. Symptomatic pelvic hematoma following transvaginal reconstructive pelvic surgery: incidence, clinical presentation, risk factors and outcome. Eur J Obstet Gynecol Reprod Biol 2010; 153: 211-214.
4. Chill HH, Amsalem I, Karavani G, Amit S, Benshushan A, Shveiky D. Symptomatic pelvic hematoma following hysterectomy: risk factors, bacterial pathogens and clinical outcome. BMC Womens Health 2020; 20: 272.
5. Chaudhry SM, Anwer S. Presentation and management of vaginal vault hematoma after hysterectomy. J Surg Pak 2016; 21: 35-38.
6. Dane C, Dane B, Cetin A, Yayla M. Sonographically diagnosed vault hematomas following vaginal hysterectomy and its correlation with postoperative morbidity. Infect Dis Obstet Gynecol 2009; 2009: 91708.
7. Spencer C, Fiadjoe P, Abdel-Razek A. Role of routine vault drainage at vaginal hysterectomy. BJOG 2012; 119: 1015-1016.
8. Kulkarni S, Vijaya N. Detection of vault hematoma by ultrasound scan following hysterectomy and its correlation with morbidity. J Obst Gynecol India 2006; 56: 507-510.
9. Kho RM, Hilger WS, Hentz JG, Magtibay PM, Magrina JF. Robotic hysterectomy: technique and initial outcomes. Am J Obstet Gynecol 2007; 197: 113.e1-114. Erratum in: Am J Obstet Gynecol 2007; 197: 332.
10. Thomson AJ, Farquharson RG. Vault haematoma and febrile morbidity after vaginal hysterectomy. Hosp Med 2000; 61: 535-538.
11. Clarke-Pearson DL, Geller EJ. Complications of hysterectomy. Obstet Gynecol 2013; 121: 654-673.
12. Rivera AM, Boucher HW. Current concepts in antimicrobial therapy against select gram-positive organisms: methicillin-resistant Staphylococcus aureus, penicillin-resistant pneumococci, and vancomycin-resistant enterococci. Mayo Clin Proc 2011; 86: 1230-1243.
13. Chang WC, Hsieh CH, Lin CC, Lin WC, Hung YC, Wu WC. An analysis of risk factors for postoperative pelvic cellulitis after laparoscopic-assisted vaginal hysterectomy. Taiwan J Obstet Gynecol 2011; 50: 463-467.
14. Kjølhede P, Halili S, Löfgren M. Vaginal cleansing and postoperative infectious morbidity in vaginal hysterectomy. A register study from the Swedish National Register for Gynecological Surgery. Acta Obstet Gynecol Scand 2011; 90: 63-71.
15. ACOG Practice Bulletin No. 195: Prevention of infection after gynecologic procedures. Obstet Gynecol 2018; 131: e172-189.
16. Toglia MR, Pearlman MD. Pelvic fluid collections following hysterectomy and their relation to febrile morbidity. Obstet Gynecol 1994; 83:766-770.