Chapter 121

Gynecologic Pain and Vaginal Bleeding

Colleen Roche

The possibility of pregnancy must be assessed in every patient with either vaginal bleeding or pelvic pain.

Abnormal vaginal bleeding may be a sign of malignancy, chronic disease, or sexual abuse.

With the exception of physiologic withdrawal bleeding in the neonate, vaginal bleeding is always abnormal in the prepubescent female.

Patients with ovarian torsion may have normal ultrasound findings in up to 50% of cases.

Dysfunctional uterine bleeding is a diagnosis of exclusion.

Postmenopausal women who have new onset vaginal bleeding must be evaluated for cancer.

Ectopic pregnancy, acute appendicitis, and ovarian torsion must be ruled out in every patient with acute pelvic pain.

Scope

Vaginal bleeding and pelvic pain are relatively common complaints in women presenting to the ED. When approaching a patient with vaginal bleeding and/or pelvic pain, it is essential to determine if the patient is pregnant. When caring for any woman of childbearing age, pregnancy and pregnancy-related pathologies must be considered, such as ectopic pregnancy and placental abruption. Vaginal bleeding and pelvic pain in the pregnant patient are discussed in Chapters 116, 118, and 119; this chapter is focused solely on vaginal bleeding and pelvic pain in the nonpregnant female.

Vaginal bleeding may occur in women of all ages, from infancy into the postmenopausal years. The normal menstrual cycle ranges from 21 to 35 days and lasts from 2 to 6 days. The average volume exuded in a normal menstrual cycle is 20 to 60 mL per cycle, although it has been found that patients cannot adequately estimate the amount of their menses. Normal menstrual blood does not clot.

Pelvic pain uncommonly occurs concurrently with vaginal bleeding in the nonpregnant patient. Pelvic pain in nonpregnant women may be indicative of either an acute or a chronic process. Pelvic pain tends to affect women of childbearing age more than women at the extremes of age. Pelvic pain can occur in postmenopausal women but is often a late finding of a more insidious disease process such as cancer. Noninfectious causes of pelvic pain are discussed in this chapter.
Structure and Function

The female reproductive system is controlled by the hypothalamic-pituitary-ovarian axis. The hypothalamus releases gonadotropin-releasing hormone (GnRH), which affects the pituitary gland to release follicle-stimulating hormone (FSH) and luteinizing hormone (LH). Both FSH and LH act on the ovaries in a feedback loop to control the amount of estrogen and progesterone produced by the ovaries themselves. Estrogen and progesterone production are ultimately responsible for the proper functioning of the female reproductive tract.

The normal female reproductive cycle is 28 days, although it ranges from 21 to 35 days. Days 1 to 14 are known as the follicular or proliferative phase. During this time, FSH levels increase, allowing a dominant ovarian follicle to mature and produce estrogen. The initial increase in estrogen halts menstruation from the previous cycle. As estrogen levels increase, the endometrium begins to thicken and stabilize, and gives positive feedback to the pituitary gland to release LH. LH stimulates ovulation on day 14. Days 14 to 28 comprise the luteal or secretory phase. The corpus luteum that remains in the ovaries after ovulation then begins to secrete progesterone, which halts proliferation of the endometrium. If implantation does not occur, the corpus luteum involutes, estrogen and progesterone levels drop markedly, and menstruation occurs.

This highly orchestrated process requires that each individual component functions properly. Any irregularities or pathology of either the hypothalamic-pituitary-ovarian axis or the female reproductive tract can lead to abnormal vaginal bleeding and can contribute to pelvic pain. Table 121-1 lists common terminology and definitions associated with abnormal vaginal bleeding.

Clinical Presentation

In the evaluation of a patient presenting to the ED with vaginal bleeding or pelvic pain, careful history and a complete physical examination can narrow the differential diagnosis significantly and can accurately delineate the diagnosis. Acute trauma, infection, and systemic disorders may be properly diagnosed without further testing. The Documentation box lists important aspects of the history necessary to the proper care of a nonpregnant patient with vaginal bleeding or pelvic pain.

Presenting Signs and Symptoms

- **PELVIC PAIN**

Women may present to the ED with either acute or chronic pelvic pain. Acute pelvic pain may be secondary to life-threatening or organ-threatening processes and requires prompt attention. Chronic pelvic pain is usually indicative of a more indolent process such as a reproductive tract infection or endometriosis.

### Documentation

- Age of patient
- Onset and duration of symptoms
- History of prior pregnancies
- Duration and frequency of past periods
- Number of sexual partners
- Contraception methods
- Presence of postcoital bleeding
- History of previous abnormal Pap smears
- History of previous or sexually transmitted diseases or pelvic infections
- History of past or present exogenous hormone utilization
- Recent trauma
- Associated symptoms including fever, breast changes, anorexia, vomiting, weight fluctuation, hirsutism, and bowel or bladder changes
- Fast medical and surgical history
- Medication history

### Table 121-1 COMMON TERMINOLOGY AND DEFINITIONS

<table>
<thead>
<tr>
<th>Terminology</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Amenorrhea</td>
<td>Cessation of menses for &gt;6 months</td>
</tr>
<tr>
<td>Dysmenorrhea</td>
<td>Pain associated with menses</td>
</tr>
<tr>
<td>Hypomenorrhea</td>
<td>Menstrual volumes &lt;20 mL/cycle</td>
</tr>
<tr>
<td>Menometrorrhagia</td>
<td>Prolonged or heavy bleeding at irregular intervals</td>
</tr>
<tr>
<td>Menorrhagia</td>
<td>Menses &gt;80 mL/cycle or occurring for &gt;6 days</td>
</tr>
<tr>
<td>Metrorrhagia</td>
<td>Vaginal bleeding between menstrual cycles; irregular cycles</td>
</tr>
<tr>
<td>Oligomenorrhea</td>
<td>Decreased frequency of menstrual cycles; &gt;35 days between cycles</td>
</tr>
<tr>
<td>Polymenorrhea</td>
<td>Increased frequency of menstrual cycles; &lt;21 days between cycles</td>
</tr>
<tr>
<td>Postmenopausal</td>
<td>Bleeding occurring 6 to 12 months after menopause</td>
</tr>
</tbody>
</table>
VAGINAL BLEEDING

Vaginal bleeding occasionally can be mistaken for urinary or rectal bleeding, and it is important to note that distinction through the history and physical examination.

Differential Diagnosis

VAGINAL BLEEDING

The most common causes of abnormal vaginal bleeding in the nonpregnant patient are uterine leiomyomas and dysfunctional uterine bleeding. Box 121-1 lists the differential diagnoses of vaginal bleeding in the nonpregnant patient.

Trauma

Vaginal bleeding can be the result of injuries to the female genitalia by either blunt or penetrating trauma. These injuries occur from childhood through adulthood. Pain of the external genitalia often is pronounced, and patients may even avoid urination because of the associated pain.

Blunt injuries to the external genitalia, such as straddle injuries, commonly result in lacerations of the labia majora and minora. Less common injuries include vulvar hematomas and lacerations of the posterior fourchette. Bleeding is often self-limited, but further intervention may be warranted.

Hymenal and vaginal injuries are not related to blunt trauma and indicate a penetrating mechanism. These injuries are often attributed to consensual sexual practices, but the possibility of sexual abuse should be explored in every patient. Hymenal or vaginal lacerations in a minor should always suggest sexual abuse, and further investigation is paramount.

Vaginal Foreign Body

Mild vaginal bleeding may be the only presenting sign in a patient with a retained vaginal foreign body. Vaginal foreign bodies can lead to vaginal bleeding due to direct trauma, local irritation, and/or superimposed infections. Females are often aware that they have a retained vaginal foreign body, although some are not, and a thorough speculum examination may be warranted. Previously unrecognized vaginal foreign bodies are often discovered in both minors and adults with psychiatric illnesses. The two most common retained foreign bodies are toilet tissue (minors) and tampons, although a wide range of retained vaginal foreign bodies have been recognized. Despite the fact that children tend to place foreign bodies in novel places, the presence of vaginal foreign bodies in a minor should prompt a serious consideration of sexual abuse.

Infection

Although patients with vaginal and pelvic infections may present initially with vaginal bleeding, this symptom rarely exists in isolation. Patients often have a concurrent vaginal discharge and may even have pelvic pain or fever depending on the extent of the infection.

Sexually active women with vaginal infections can have mild vaginal bleeding from the local inflammatory process. This mild bleeding is most often linked to Trichomonas infection and is self-limited. Examination often reveals inflammation of the vaginal walls and a friable cervix.

Dysfunctional Uterine Bleeding

Dysfunctional uterine bleeding is the most common cause of menorrhagia (excessive uterine bleeding) in menstruating females. It can be ovulatory or anovulatory.

Ovulatory dysfunctional uterine bleeding is less common than anovulatory dysfunctional uterine bleeding and is secondary to abnormalities of uterine hemostasis regulated through cytokine and prostaglandin production. Patients with ovulatory dysfunctional uterine bleeding present with increased menstrual flow, but it occurs at expected intervals.

Anovulatory dysfunctional uterine bleeding occurs when ovulation has failed. This can be due to a dis-
ruption in the hypothalamic-pituitary-ovarian axis or to systemic disease. Primary ovarian disorders, most notably polycystic ovarian disease, are associated with anovulation. When ovulation fails to occur, progesterone is not produced, and the uterine lining is exposed to an unopposed estrogen supply. Eventually, the endometrium outgrows its vascular supply and degenerates, leading to irregular menses with flow alternating between heavy and scanty. Blood loss may be extreme and patients may present with signs and symptoms of hypovolemic shock.

Anovulatory dysfunctional uterine bleeding is most common in post-pubescent females, secondary to immaturity of hypothalamic function. As the hypothalamic function develops, the menses ultimately are regulated.

Women of reproductive age can experience anovulatory cycles secondary to extreme weight fluctuations, exercise, or stress. Anovulatory cycles can occur in perimenopausal women as well but can be indistinguishable in the ED from more pathologic etiologies such as endometrial cancer.

- **Benign Uterine Abnormalities**

  - **Polyps**

  Women may present to the ED with vaginal bleeding secondary to benign uterine or cervical polyps. This painless vaginal bleeding is often seen in women of reproductive age shortly after intercourse, secondary to direct trauma. Whereas cervical polyps usually are easily visualized on examination, uterine polyps may not be. Polyps rarely become malignant, and bleeding is self-limited.

  - **Uterine Leiomyomas (Fibroids)**

  One of the most common causes of menorrhagia is uterine leiomyomas. These benign tumors develop from the myometrium and distort the normal contour of the endometrium. The resulting increase in the surface area of the endometrium results in greater menstrual volumes.

  Patients with uterine leiomyomas often have a history of menorrhagia over several months to years. These benign tumors typically are discovered in the fourth decade of life and are most prevalent in black females. Patients may experience pain from uterine cramping or infarction (resulting from the tumor outgrowing its blood supply or twisting and cutting off the blood supply). On examination, these tumors often cannot be palpated and are ultimately discovered by sonography. There may be a significant blood loss from uterine leiomyomas, and secondary signs of anemia, including shock, should be rapidly recognized.

  - **Malignancy**

Malignancy of the female reproductive tract can lead to irregular vaginal bleeding. Bleeding can occur secondary to anatomic changes, local inflammation, or hormone production. Primary cancers of the external genitalia and vagina are rare and can be recognized on thorough examination of the genitalia. Postmenopausal women are at greater risk for these malignancies. More common malignancies are discussed in the following sections.

- **Endometrial Cancer**

Patients with endometrial cancer experience peri- or postmenopausal bleeding. This bleeding is often painless although occasionally can be quite severe. Risk factors for the development of endometrial cancer include age older than 35 years, history of anovulatory cycles, diabetes mellitus, nulliparity, obesity, history of tamoxifen therapy or exogenous estrogen use without progestins. Whereas routine Papanicolaou smears can detect approximately 50% of cases of endometrial cancer, many cases remain undiagnosed, and many patients may present initially to the ED with abnormal vaginal bleeding.

- **Cervical Cancer**

Patients with undiagnosed cervical cancer may present to the ED with painless, abnormal vaginal bleeding. Bleeding is often postcoital or associated with localized inflammation. Physical examination often does not reveal obvious abnormalities. The peak incidence of cervical cancer is in women from 45 to 54 years of age, although it is increasing in women in their 20s and 30s, due to the increased incidence of human papillomavirus. Risk factors include multiple sexual partners, early pregnancy, early intercourse, and history of prior sexually transmitted diseases.

- **Ovarian Tumors**

Patients with ovarian tumors may present with vaginal bleeding from abnormal hormone secretion, but more commonly present with signs and symptoms related to mass effect. Patients typically complain of urinary frequency, constipation, or rectal fullness, pelvic pressure, abdominal pain, and bloating. The physical examination may reveal a palpable mass. A palpable ovary in a postmenopausal woman should be considered cancerous until proved otherwise. The peak incidence of ovarian tumors is in women 55 to 65 years of age. Risk factors include frequent ovulation, nulliparity, late menopause, and late childbearing age. Previous use of oral contraceptives is believed to decrease the risk of ovarian cancer.

- **Systemic Disorders**

Multiple systemic illnesses, particularly those that affect hematologic or endocrine homeostasis, can lead to abnormal vaginal bleeding. Table 121-2 lists systemic disorders associated with abnormal vaginal bleeding. Exogenous medications that may contribute...
Table 12.1: Diagnoses Associated with Abnormal Turner Bleeding

<table>
<thead>
<tr>
<th>Abnormalovulatory cycles</th>
<th>Ovarian Torsion</th>
<th>Appendicitis</th>
<th>Tubo-ovarian abscess</th>
<th>Inflammatory bowel disease</th>
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<th>Diverticulitis</th>
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### Ovarian Torsion

Ovarian torsion occurs when the ovary and fallopian tube twist upon their vascular supply. Various conditions can cause it, including obstruction of the ovarian artery, leading to edema and congestion of the ovary. This results in a decrease in arterial flow to the ovary, resulting in pain and discomfort. The patient may experience acute onset of unilateral pelvic pain. The pain is often severe and may be associated with nausea and vomiting. Physical examination reveals an enlarged, tender ovary. This process results in necrosis of the ovary and the affected ovary must be effectively ruled out in any patient presenting with acute pelvic pain.

### Appendix Torsion

Appendicitis is a condition characterized by inflammation of the appendix. It is caused by the formation of a mass of inflammatory cells, often due to a bacterial infection. The symptoms include abdominal pain, vomiting, and fever. Physical examination reveals tenderness in the right lower quadrant of the abdomen.

### Tubo-ovarian Abscess

A tubo-ovarian abscess is a collection of pus in the ovary and fallopian tube, usually caused by a bacterial infection. The symptoms include fever, abdominal pain, and vaginal discharge. Physical examination reveals signs of peritonitis and pelvic tenderness.

### Inflammatory Bowel Disease

Inflammatory bowel disease (IBD) is a chronic condition characterized by inflammation of the digestive tract. It includes ulcerative colitis and Crohn's disease. The symptoms include abdominal pain, diarrhea, and rectal bleeding. Physical examination reveals signs of inflammation in the abdominal area.

### Intussusception

Intussusception is a condition where one part of the intestine (the intussusceptum) protrudes into another part (the intussusceptum). It is often caused by inflammation or a foreign body in the bowel. The symptoms include abdominal pain, vomiting, and bloating. Physical examination reveals signs of obstruction in the abdomen.

### Diverticulitis

Diverticulitis is a condition where diverticulitis perforates, leading to inflammation and infection. It is often caused by diverticulosis, which is the presence of small pouches in the colon. The symptoms include abdominal pain, fever, and vomiting. Physical examination reveals signs of peritonitis.

### Pelvic Inflammatory Disease

Pelvic inflammatory disease (PID) is a condition caused by a bacterial infection of the female reproductive organs. It is often caused by sexually transmitted infections (STIs). The symptoms include abdominal pain, fever, and vaginal discharge. Physical examination reveals signs of peritonitis and pelvic tenderness.
ovarian torsion. Ovarian torsion can occur in smaller ovaries, and the absence of any mass does not preclude the diagnosis. The right ovary is more commonly affected than the left. 10% of women with ovarian torsion will experience torsion of the contralateral ovary in their lifetime.

Corpus Luteal Cysts (Hemorrhagic Cysts)

As the normal corpus luteum degenerates during the normal reproductive cycle, a small cystic space forms. Thin-walled capillaries invade these cysts and can cause minimal, self-limited bleeding into the cyst. Occasionally, bleeding can be rapid or more extensive. Intracystic pressures can then rise, leading to rupture of the corpus luteum.

Patients with ruptured corpus luteal cysts present with acute onset of unilateral pelvic pain, ranging from mild to severe. Nausea and vomiting frequently are associated symptoms. Rectal pain may occur due to the presence of blood in the cul-de-sac. The amount of bleeding is variable. Hemorrhage may occur into the peritoneal cavity, particularly if the patient has received anticoagulation. Signs of hypovolemia and peritonitis may then be present.

Endometriosis

Endometriosis is defined as the presence of endometrial tissue in a location outside of the uterine cavity. This heterotopic tissue is most commonly located near the ovary and in other dependent portions of the pelvis. The tissue is subject to hormonal variations, and pain can ensue from bleeding and the presence of scar tissue.

Endometriosis generally affects women of reproductive age and is most commonly seen in nulliparous women in their mid-30s. Pain is often chronic in nature and poorly localized. A history of cyclical pain is often elicited. Endometriosis can be associated with dysmenorrhea or dyspareunia. Gastrointestinal symptoms and constitutional symptoms, such as fever, may occur but are rare.

Diagnostic Testing

Certain diagnostic tests can enhance the diagnostic ability of the EP and aid in the disposition of the patient (Fig. 121-1). Vaginal wet preparations and cultures can properly identify infectious agents. Complete blood counts can reveal the presence of leukocytosis, anemia, or thrombocytopenia. Coagulation studies and blood urea/creatinine and liver function tests can help diagnose systemic disease processes. Urinalysis can reveal cystitis or other infectious processes.

Pelvic sonography should be performed in the ED if there are any signs or symptoms of ovarian torsion or tuboovarian abscess. Doppler flow studies should be performed in any patient with suspected ovarian torsion, although up to 50% of these studies are normal in the setting of acute torsion. If the index of clinical suspicion remains high, the gynecology service should be consulted for intraoperative diagnosis.

Pelvic sonography is sensitive for diagnosis of uterine leiomyomas, polyps, masses, and endometrial cancer, and it can be performed on an outpatient basis.

Diagnostic tests cannot identify dysfunctional uterine bleeding; it is a diagnosis of exclusion, and all other causes of vaginal bleeding must be excluded by the EP before that diagnosis is made.

Treatment

Although vaginal bleeding in the nonpregnant patient rarely leads to significant blood loss, aggressive resuscitation is necessary for patients with symptomatic hypovolemia or anemia. Volume repletion can be enhanced by packed red blood cells and fresh frozen plasma or platelet transfusion if necessary. Dilution and curetage may be necessary to halt ongoing hemorrhage, and early gynecology consultation is of utmost importance.

Pain management is essential. Rapid treatment of pain with narcotic or non-narcotic agents and frequent reassessment of the patient's pain are paramount.

TRAUMA

Mild abrasions or non-repairable lacerations should be cleaned and dressed with topical antibiotic ointment. External lacerations requiring repair should be properly anesthetized and cleaned. Absorbable suture material should be used. The gynecology service should be consulted for definitive repair of all vaginal or cervical lacerations.

Tips and Tricks

- All women of childbearing age presenting to the ED are assumed to be pregnant until proved otherwise with a pregnancy test.
- Ovarian torsion presents as acute severe unilateral pain and a gynecologist should evaluate the patient with a history suggestive of torsion even when ultrasound findings are negative.
- Adolescents with abnormal bleeding should be evaluated for potential pregnancy, sexual abuse, and eating disorders. If results are negative, the patient can be discharged with reassurance that the bleeding is likely due to anovulation, which will become more regular with time.
- About 20% to 25% of cases of endometrial cancer occur prior to menopause; all patients with abnormal uterine bleeding should be referred to the gynecology service for endometrial evaluation as an outpatient.
- Hypothyroidism can cause severe menorrhagia.

Figure 121-1

- Foreign body.
- Vaginal bleeding.
- Infection.
- Once the cause is identified, treatment is determined.
- Bladder...
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### FOREIGN BODIES

Vaginal bleeding secondary to foreign bodies is generally resolved once the offending agent has been removed.

### INFECTION

Once the cause of vaginitis has been adequately diagnosed by examination and wet preparation assay, treatment should be directed at elimination of the offending organism.

### DYSFUNCTIONAL UTERINE BLEEDING

Gynecologists manage dysfunctional uterine bleeding with nonsteroidal antiinflammatory drugs (NSAIDs), progestins, and estrogens. Because dysfunctional uterine bleeding is a diagnosis of exclusion, it is difficult to prescribe definitive therapy in the ED.

Treatment for acute episodes includes low-dose oral contraceptives two to three times daily for 7 days, 7 days off for withdrawal bleeding, and then once daily for 3 months. Chronic bleeding can be approached by starting oral contraceptives at a regular
daily dose, or 5 to 10 mg of medroxyprogesterone acetate can be given daily for 10 days every month.

**BENIGN UTERINE ABNORMALITIES**

There is no definitive treatment for cervical or endometrial polyps in the ED. Patients should be referred for outpatient removal. Mild to moderate bleeding from uterine leiomyomas can be treated with NSAIDs; gynecologists often recommend a trial of outpatient combination oral contraceptives. Patients with severe problems related to the uterine leiomyomas may be candidates for uterine artery embolization or hysterectomy.

**MALIGNANCY**

Treatment of patients with reproductive malignancies should be directed at the secondary effects of the malignancy. If the patient is relatively asymptomatic, definitive treatment should be coordinated with the patient’s gynecologist.

**OVARIAN TORSION**

Acute ovarian torsion requires adequate pain management and emergent gynecology consultation for operative intervention.

**RUPTURED CORPUS LUTEAL CYST**

In patients with normal coagulation and no signs of hypovolemia, pain management is the most impor-

tant intervention in the ED. Oral contraceptives can be started in ED to prevent future ovulation.

**ENDOMETRIOSIS**

Oral contraception is the mainstay of treatment for endometriosis. NSAIDs have been found to have minimal efficacy in the treatment of endometriosis.

**Disposition**

Patients with signs of either symptomatic anemia or hypovolemia should be admitted to the hospital for definitive treatment and care. This occurs in a minority of nonpregnant patients with acute vaginal bleeding. The majority of patients can be treated and managed as outpatients in conjunction with the gynecology service. Strict follow-up is necessary to ensure cessation of bleeding and to rule out the presence of malignancy.

The disposition of patients with pelvic pain depends on their clinical state and diagnosis. Patients with acute ovarian torsion need to be admitted to the gynecology service for definitive treatment. Patients with corpus luteal cysts can be treated as outpatients if their pain is adequately controlled and if their condition is stable and without risk factors for hemorrhage. Endometriosis can be managed on an outpatient basis if pain is managed appropriately.