This CE activity is approved by EMS World, an organization accredited by the Continuing Education Coordinating Board for Emergency Medical Services (CECBEMS), for 1.5 CEUs.

**OBJECTIVES**

- Review acute complications of pregnancy.
- Discuss signs and symptoms of ectopic pregnancies.
- Discuss signs and symptoms of spontaneous abortion.
- Discuss signs and symptoms of abruptio placentae.

To take the CE test that accompanies this article and receive 1.5 hours of CE credit accredited by CECBEMS either:

1. Go online to EMSWorld.com/ctest to download a PDF of the test.
2. Or go online to www.rapidce.com to take the test and immediately receive your CE credit.

Questions? E-mail editor@EMSWORLD.com.
VAGINAL BLEEDING in the Pregnant Patient

What can cause it, and what should you do?

Despite advances in prenatal care and pregnancy planning, pregnant women still die at a high rate in the United States. The U.S. pregnancy-related mortality rate remained between 12.0–16.8 deaths per 100,000 live births between 1998–2005. This staggering rate was higher than in previous decades. African-American women continue to experience a pregnancy-related death rate up to four times greater than white women.

Acute complications of pregnancy can occur in all trimesters. These include emergencies such as ectopic pregnancy in the first trimester, pregnancy-induced hypertension in the second and third trimesters, and abruptio placentae in the third trimester. Many acute complications of pregnancy are accompanied by vaginal bleeding, and this month’s article uses a case-based approach to explore some of the more life-threatening. We will use the process of working through a differential diagnosis to show how to evaluate and weigh the evidence for and against the various etiologies of vaginal bleeding in the pregnant patient and arrive at a best guess for a diagnosis. The listed possible diagnoses are not meant to be inclusive, but to serve as a starting point for discussion of causes of vaginal bleeding in the pregnant patient.

Case #1


A 42-year-old African-American female presents conscious, alert and oriented in moderate distress complaining of abdominal pain. She describes a three-day history of pain described as a constant ache in her lower left quadrant and rated a 4 on a scale of 0–10. The pain is not associated with eating or movement. She also describes some mild vaginal bleeding over the same period that has required 1–2 feminine pads a day. The bleeding has been steady and not related to movement or sexual activity. She reports no pain, urgency or unusual frequency with urination. She denies any chest discomfort or pain, difficulty breathing, nausea, vomiting, dizziness, weakness or syncope.

The patient has had three previous full-term pregnancies without complication, then had a tubal ligation five years ago after the birth of her last child. Her last menstrual period (LMP) was 5 weeks ago, though she says it is not uncommon for her to be up to a week late. She says she and her husband have had sex since her last menses, “but there is no way I could be pregnant.” She has no significant medical history, is a social drinker and smokes half a pack of cigarettes a day.
Your clinical exam reveals pain with palpation to her lower quadrants bilaterally, though it is much worse on the left. No abdominal masses are palpable, though her abdomen is rigid as she involuntarily guards while palpation is performed. Her vital signs are heart rate 102/min. and regular; respiratory rate 18/min. with good tidal volume; blood pressure 114/70; pulse oximetry 97% on room air; tympanic temperature 98.9ºF (37ºC). Her blood glucose is 114 mg/dL.

**DISCUSSION**

An ectopic pregnancy is a complication in which the fertilized and developing embryo implants outside the uterus. Possible sites of implantation include the Fallopian tube (the most common site, termed a *tubal pregnancy*), ovaries, cervix and in the peritoneal cavity (see Figure 1). Ectopic pregnancies are not viable and represent a potential life threat to the mother.

When the embryo implants in the Fallopian tube, its growth can rupture the tube, leading to massive hemorrhage capable of causing hemorrhagic shock and death. Because of the high mortality associated with ectopic pregnancy, consider it in all women of childbearing age who present with abdominal or pelvic complaints with vaginal bleeding, have been sexually active, and have otherwise unexplained signs or symptoms of hypovolemia.

The classic triad associated with ectopic pregnancy consists of abdominal pain, vaginal bleeding and amenorrhea (missed menses), and this patient is experiencing all three. Unfortunately, this triad has a low positive predictive value, as it is neither sensitive nor specific and is absent in up to 50% of cases and more common in miscarriage than ectopic pregnancy.5,6 The most common symptom of ectopic pregnancy is abdominal pain.

---

**Table 1: Risk Factors for Ectopic Pregnancy**

- History of pelvic inflammatory disease
- History of tubal ligation or other tubal surgery
- Use of intrauterine device
- History of ectopic pregnancy
- History of smoking
- Advanced age
- History of spontaneous or medically induced abortion
pain or discomfort, which occurs in 90% of patients who have it. The discomfort or pain associated with a developing (distending) ectopic pregnancy can be described as diffuse, crampy and nonspecific. The pain associated with rupture is often described as sharp, severe, constant and peritoneal in nature. Referred shoulder pain can occur secondary to irritation of the diaphragm when there is blood in the peritoneal cavity. While it’s not a common symptom, the suspicion of free blood in the peritoneal cavity is greatly important. Signs and symptoms of shock at the time of presentation are highly suggestive of rupture. This patient did not exhibit those but did present with a rigid abdomen, which should always be concerning, as it strongly suggests life-threatening abdominal pathology. The classic sign of amenorrhea from 4–12 weeks after the last normal menses occurs about 70% of the time, but no missed menses is reported in about 15%–20% of all cases of ectopic pregnancy, making this history unreliable. Vaginal bleeding is reported in 50%–80% of cases. Discerning between menses (normal, early or late) and vaginal bleeding of some other etiology can be difficult for the prehospital provider. Rely on the patient to interpret if her bleeding is normal or not.

Risk factors can be absent in up to half of all ectopic pregnancies (see Table 1). This patient, however, has multiple risk factors including histories of smoking and tubal ligation. In addition, the rate of ectopic pregnancy is highest in older women and minorities, and this patient belongs to both groups.

For theprehospital care provider, an ectopic pregnancy is much like trauma in that we cannot “fix” the cause of hemodynamic insult; the patient requires a surgeon. For us treatment consists of supportive and comfort measures only. In this patient there are no signs or symptoms of hemodynamic instability secondary to rupture of the ectopic pregnancy, so care can be limited to analgesia and a safe transport. BLS treatment, including placing the patient in a position of comfort and keeping her warm, would suffice.

Treat a patient with suspected ectopic rupture and hemodynamic instability like every other patient with hypovolemic shock secondary to intra-abdominal hemorrhage. BLS treatment includes maintaining an open airway, ensuring adequate ventilation and providing supplemental oxygen. Oxygen via nasal cannula is adequate in 99% of patients. If it isn’t, consider a NRB or BVM ventilations. ALS interventions include the use of an advanced airway if necessary, intravenous access and administration of an isotonic crystalloid to replace fluid volume if the patient is hypotensive. Paramedics can consider the use of fentanyl, as it has a relatively short half-life and has not been shown to exacerbate hypotension or bleeding. Avoid morphine, as it causes a histamine release that may trigger hypotension. Remember, the old EMS myth that giving analgesia will inhibit accurate diagnosis of abdominal pain in the ED has been shown to be untrue. Paramedics should always consider pain control in the patient with abdominal pain, in accordance with their protocol.

This patient’s presentation was also consistent with a spontaneous abortion (miscarriage), a fairly common occurrence in pregnancy. The World Health
Organization defines spontaneous abortion as the spontaneous loss of pregnancy before 20 weeks’ gestation or loss of a fetus weighing less than 500 grams. Spontaneous abortion that occurs prior to 6 weeks since the LMP is termed very early pregnancy loss and occurs in approximately 25% of pregnancies.

Prehospital treatment of spontaneous abortion is supportive only.

Vaginal bleeding (with or without abdominal pain) is the most common complaint of patients with spontaneous abortion. This bleeding may be heavy and contain blood clots and, depending on the gestational age, fetal tissue. Any abdominal pain during the spontaneous abortion tends to resolve with its completion.

Overall, this patient is at lower risk for spontaneous abortion, as she has had a tubal ligation and the odds of successful fertilization and implantation of an egg in the uterus are low. The tubal ligation, in fact, puts her at increased risk for ectopic pregnancy.

Prehospital treatment of spontaneous abortion is supportive only. Of particular importance is the emotional care a patient may require. The loss of a fetus can be very disturbing, and emotional support may be the best and most appreciated care you can provide. Use a feminine pad to collect any blood or tissue that is still actively flowing. Place the pad over the vagina, not into the vaginal canal. If bleeding is heavy and signs and symptoms of hypovolemic shock are present, then ALS care, including volume replacement with isotonic crystalloids, may be necessary. Fortunately the incidence of massive hemorrhage from spontaneous abortion is quite low.

Pelvic inflammatory disease (PID) is also high in the differential diagnosis for this patient with abdominal pain and vaginal bleeding. PID is an infectious inflammatory disease of the female reproductive tract including the vagina, cervix, uterus, Fallopian tubes and ovaries. Bacterial infections are the most common, though viral, fungal and parasitic infections can also occur. Untreated, PID can lead to infertility, ectopic pregnancy, abscess formation and chronic pelvic pain. It is estimated that more than 750,000 females experience an episode of PID every year, and up to 10%–15% of them may become infertile as a result.

Most cases of PID are believed to occur in two stages. In the first, the patient acquires a vaginal or cervical infection. This is often sexually transmitted, with chlamydia and gonorrhea being common infectious organisms. For More Information Circle 51 on Reader Service Card
In the second stage, the infectious organisms migrate from the vagina and cervix to the uterus, Fallopian tubes and possibly the ovaries. Risk factors for PID include multiple sexual partners, a history of prior sexually transmitted infections and a history of sexual abuse.14

The clinical examination findings characteristic of PID can vary widely between patients, and subclinical infections can exist for long periods of time without the patient or physician being aware. Lower abdominal pain is a common complaint, and is often described as aching, crampy, dull, bilateral and constant, but worse with movement or sexual activity. Other symptoms include vaginal discharge (up to 75% of patients), postcoital vaginal bleeding (more than one third of patients), nausea, vomiting, fever and malaise.15

The symptoms of PID occur most often at the end of menses and early in the new menstrual cycle. There are a couple of elements of this patient’s history and clinical exam that on the surface would suggest PID. Specifically, she is experiencing abdominal pain and vaginal bleeding at the end of her menstrual cycle. However, her abdominal pain is located in her lower left quadrant, not bilaterally, and her vaginal bleeding has been constant and not associated with sexual activity. Unilateral abdominal pain is not consistent with PID. Exploring the patient’s sexual history to identify risk factors such as multiple partners or history of past STIs can be difficult in the prehospital setting, as the lack of privacy may make the patient reluctant to be honest about it. In addition, the utility of such information is questionable, as this is not a life-threatening event and treatment decisions will not be made on the answers. Our advice is to obtain enough information to feel confident that any vaginal bleeding is not associated with a serious hemorrhage, then leave the sensitive and personal questions to the ED staff. Do ask questions, though, when the answers are necessary to direct treatment or a specific destination choice!

Case #2
A 38-year-old pregnant female with abdominal pain and vaginal bleeding. Differential to consider: abruptio placentae, placenta previa.

A 38-year-old pregnant Caucasian female presents conscious, alert and oriented in moderate distress lying on a couch and complaining of abdominal pain and vaginal bleeding after a domestic dispute with her boyfriend. She says she was “thrown to the ground” during an argument that occurred about 24 hours ago, but denies hitting her head, being hit or any other trauma. She also denies any neck or back pain, chest pain, headache, nausea, vomiting, dizziness or loss of consciousness, but
states that she does get dizzy “when I stand up and walk around.” She says the abdominal pain started immediately after the incident and has been sharp and constant. She describes the pain as a 4 on a scale of 0–10. The vaginal bleeding started about 20 hours ago, and she has used 4–5 feminine pads to soak up the flow. The patient also says she has experienced neither uterine contractions nor membrane rupture (i.e., had her “water break”).

The patient is 7½ months pregnant with a G4P2A2 obstetric history (see sidebar), with two cesarean sections and two elective abortions. She has a medical history significant for hypertension, for which she has been noncompliant with her medication for “about a year.” She smokes half a pack of cigarettes a day and admits to a history of crack cocaine use, but says she hasn’t used the drug since finding out she was pregnant. She has not received any prenatal care since being told she was pregnant during a visit to the emergency department six months ago.

Your physical exam reveals a gravid uterus and distended abdomen consistent with a 7½-month gestational period. She winces and flexes her abdominal muscles (guards) during palpation, but you are able to feel that her uterus is rigid and contracted. There are no contractions of labor during your examination. You note that her skin is dry, cool and slightly pale, with a capillary refill of 4 seconds. Her vital signs while supine are heart rate 122/min. and regular; respiratory rate 26/min. with good tidal volume; blood pressure 94/52; pulse oximetry 96% on room air; and tympanic temperature 97.9ºF (36.6ºC).

**DISCUSSION**

Abruptio placentae, the premature separation of the placenta from the uterine wall, is thought to account for up to 30% of all episodes of vaginal bleeding during the second half of pregnancy.6 Not all cases of abruptio will result in bleeding, though, as small separations may go undetected if blood remains trapped beneath the placenta, in which case the abruptio is termed concealed. Abruptio placentae may be partial or complete. It is a serious and life-threatening issue for both the mother and fetus. It may disrupt circulation and gas exchange between the two, resulting in fetal hypoxia and death. Excessive blood loss from abruptio can easily lead to development of hypovolemic shock and death in the mother, especially since there is limited ability for vasoconstriction to slow hemorrhage when the placenta separates from the uterus. If the mother experiences hemodynamic compromise secondary to hypovolemic shock, so will the fetus!

Risk factors for abruptio placenta are listed in Table 2, and this patient has a number of them, including advanced maternal age and a history of trauma, chronic hypertension, cesarean section, smoking and cocaine use. Abruptio placenta is most commonly associated with maternal hypertension and preeclampsia, during which placental inflammation and ischemia leads to a weakening of the placenta/uterine wall interface.6,16 Abruptio may occur spontaneously or be associated with seemingly minor trauma, as described in this case. This happens because of structural differences between the uterus and placental interface.

<table>
<thead>
<tr>
<th>Table 2: Risk Factors for Abruptio Placenta</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Advanced maternal age</td>
</tr>
<tr>
<td>• History of cesarean section or other uterine surgery</td>
</tr>
<tr>
<td>• History of smoking</td>
</tr>
<tr>
<td>• History of cocaine abuse</td>
</tr>
<tr>
<td>• History of hypertension (chronic or pregnancy-induced)</td>
</tr>
<tr>
<td>• Previous abruptio placenta</td>
</tr>
<tr>
<td>• African-American</td>
</tr>
</tbody>
</table>

**Documenting a Woman’s Reproductive History**

Common nomenclature for documenting a woman’s reproductive history is with an abbreviation listing the patient’s GPA:

G—Gravida (number of pregnancies)
P—Para (number of live births)
A—Abortus (number of abortions)

For the purposes of history taking, abortions are defined as any spontaneous abortions prior to the 20th week of pregnancy and any planned abortions the patient has had. These are then documented in order, such as: G2P2A0. This would mean gravida 2, para 2, abortus 0. Put in colloquial terms, this woman has had two pregnancies that produced two children, and no abortions.
placenta: The uterus is relatively elastic and can stretch and contort, while the placenta is relatively inelastic and will not stretch and contort as easily. During blunt-force trauma, the shearing forces created between the elastic uterus and inelastic placenta can cause them to separate.

The clinical characteristics of abruptio placentae include vaginal bleeding, uterine pain and uterine tetany (contractions). Vaginal bleeding occurs in up to 70% of all cases. The amount can vary and gives no indication as to the severity of the event; a significant amount of blood can be lost before vaginal bleeding occurs. The description of abdominal pain can vary from mild cramping to severe tearing, and up to 20% of women with abruptio present without pain. Uterine tetany occurs when the uterus becomes irritated and contracts as a result. These are not true contractions of labor and should not be confused for them. Mild abruption is characterized by slight bleeding, no fetal distress and little or no uterine irritability. As the abruption progresses and involves more of the placenta, bleeding (which may or may not result in vaginal bleeding), uterine tetany and fetal distress increase. In response to the blood loss, maternal tachycardia will also develop. In cases of severe abruptio, severe blood loss leads to hypotension and fetal distress, and the uterus is contracted and painful to palpation. The patient in this case seems to fall into this category; consider her unstable and in need of ALS intervention. Fetal distress and death occur in approximately 15% of patients with abruptio placentae.6

Prehospital treatment of abruptio placentae centers on correcting hypovolemic shock. In a hemodynamically stable patient with no signs or symptoms of shock, BLS care is appropriate. If the patient has active vaginal bleeding, place a feminine pad over the vagina. The patient in this case shows numerous signs and symptoms of shock. She is tachycardic, hypotensive (especially when you consider she has chronic hypertension and is not taking her medications), her skin is cool and slightly pale with delayed capillary refill, and she experiences dizziness when she stands and walks around. All of this indicates that she has experienced significant blood loss and is in decompensated hypovolemic shock. This patient should receive supplemental oxygen via nasal cannula, be placed on the cardiac monitor and have a large-bore IV catheter placed. Administer an isotonic crystalloid such as normal saline to help correct hypotension.

Another cause of bleeding in the second half of pregnancy is placenta previa. Placenta previa occurs when the placenta either partially or completely covers the internal cervical os, the opening between the uterus and vaginal canal. A marginal placenta previa occurs when the placenta approaches the border of the os but does not touch it. During childbirth, the delivering fetus can damage the placenta, resulting in bleeding that can be significant and lead to hypovolemic shock. The exact cause of placenta previa is unknown, and risk factors include multiparity, multiple gestation, advanced maternal age, previous cesarean delivery or other uterine surgery, and smoking.17 Bleeding from a torn placenta is particularly dangerous because the placenta has no ability to contract to tamponade bleeding. Thus, when the placenta begins to bleed, it essentially bleeds uncontrollably. The patient in this case would be considered to have an advanced maternal age, a history of smoking and previous uterine surgery in the form of cesarean sections and elective abortions.

Placenta previa occurs in about 0.3%–0.5% of all pregnancies, and mortality associated with it is as high as 1%. Of all placenta previas, about 20%–45% are complete, 30% partial, and the remaining 25%–50% marginal.18

The classic presentation for placenta previa is painless bright-red bleeding. The first bleed tends to occur at 27–32 weeks’ gestation, and the onset is usually acute and may accompany uterine contractions. Bleeding often resolves spontaneously but may recur with contractions. This patient’s episode of vaginal bleeding is accompanied by abdominal pain and hypotension, making placenta previa less likely than abruptio placentae.

The prehospital treatment for placenta previa is mostly supportive. Place a feminine pad over the vagina if there is active bleeding. For patients with severe bleeding that leads to hypovolemic shock, ALS intervention and volume resuscitation with an isotonic crystalloid is necessary.

Conclusion

Remembering some general principles can help the EMT and paramedic in making decisions regarding the care and transport of the pregnant patient with vaginal bleeding:

• Light vaginal bleeding is not uncommon in pregnancy, but heavy bleeding or bleeding accompanied by abdominal pain is and requires evaluation in the emergency department.
• The development of hypovo-
emic shock from uncontrolled internal bleeding should always be a concern in the patient with vaginal bleeding. Assess and treat accordingly.

- Transport pregnant patients with greater than 20 weeks’ gestation to a hospital with OB capability. Those under 20 weeks’ gestation may be able to be evaluated in an ED in a hospital without OB capability. Consult with medical control regarding a destination.

REFERENCES

18. Scott R, Snyder, BS, NREMT-P, is the EMT program director for the San Francisco Paramedic Association. Contact him at scott@emsnyder@aol.com.
19. Sean M. Kivelian, MD, MPH, NREMT-P is an emergency medicine resident at the University of California, San Francisco and a former New York City paramedic. Contact him at sean.kivelian@gmail.com.
20. Kevin T. Collropy, BA, FP-C, CCEMT-P, NREMT-P, WEMT, is the performance improvement coordinator for Vitalink/Airlink in Wilmington, NC, and a lead instructor for Wilderness Medical Associates. Contact him at kcollropy@colgatealumni.org.