Chapter 17
Induced Abortion

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Background

In the United States, 1.1 million induced abortions occur annually [1]. While both medical and surgical abortions are safe, overall low-risk interventions, with a complication and mortality rate significantly less than term delivery, 2 % of patients present within 6 weeks of their abortions with abortion-related complaints [2, 3]. Providers should be able to differentiate normal postabortion findings from significant or potentially life-threatening complications, which include hemorrhage, sepsis, and visceral injury.

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Definitions

First Trimester Medical Abortion

The most commonly used regimen of medication abortion is a combination of mifepristone, an antiprogestin, and misoprostol, a prostaglandin analogue. The FDA-approved regimen consists of mifepristone 600 mg orally followed by misoprostol 400 μg orally 48 h later and is approved up to 49 days of gestation with up to 92 % efficacy [4]. The more commonly used, evidence-based regimen includes mifepristone 200 mg orally followed by misoprostol 800 μg administered buccally, sublingually, or vaginally 24–48 h later [5, 6]. This regimen is commonly provided up to 63 days gestation and is 95–99 % effective [5]. This regimen is now being extended up to 70 days gestation with an efficacy above 92 % [7]. Most women are eligible for medication abortion. Contraindications are few but include anemia (often defined as hemoglobin <9.5 or 10 g/dL), high clinical suspicion for ectopic pregnancy, current use of an intrauterine device (IUD), long-term corticosteroid use, adrenal insufficiency, coagulopathy or anticoagulant therapy, severe liver, renal, pulmonary or cardiovascular disease, uncontrolled hypertension and inability to follow-up [4, 5]. Asthma is not a contraindication to medical abortion.

As compared to surgical abortion, patients undergoing medical abortion are more likely to present to the emergency room for assessment within 6 weeks of their abortion [2]. These patients report higher rates of pain, nausea, vomiting, and diarrhea than patients undergoing surgical abortion, while no difference has been reported in infectious complications [8, 9]. Of note, misoprostol can be associated with fevers of greater than 38 °C (100.4 °F) in 40 % of women without other signs of infection, particularly in the first 24 h, though patients should still be assessed for infection [10]. As the uterus is not instrumented, infectious complications are low. Rare cases of sepsis due to *Clostridium sordellii* have been reported, noted to occur most often in patients who received vaginal misoprostol [11]. These findings have led to an

increase in buccal administration of misoprostol and routine use of prophylactic antibiotics with medical abortions, with reduction in severe infections [12].

During a medical abortion, patients routinely report bleeding heavier than a period. A patient report of soaking two maxi pads per hour for 2 h is often used as an estimate of excessive bleeding [13]. Patients have higher blood loss with medical abortion as compared to surgical abortion, with a mean hemoglobin decline of 0.7 g/dL; the amount of blood loss is directly correlated to duration of the gestation [14, 15]. Transfusion is very rarely required. Patients will commonly bleed or spot for 2 weeks, though spotting may continue for 30 days [4].

Women who undergo medication abortion should have routine follow-up to confirm abortion completion within 2 weeks. This follow-up typically includes either an ultrasound or repeat serum hCG, though other novel methods are currently being investigated. The absence of a gestational sac is evidence of a successful medical abortion [16]. Within the first week, a majority of patients will still have a thick endometrial lining with heterogenous material; these ultrasound findings are not an indication for surgical intervention [16]. Doppler flow may still be present without retained products of conception [17]. Ultrasound findings correlate poorly to patients' bleeding symptoms; a patient's report of symptoms should be used to guide decision-making regarding subsequent evacuation [18]. Alternatively, serum hCG can be used for follow-up, with an 80 % decline in serum hCG by day 7–14 from baseline indicating success [19]. Women who report little or no bleeding or ongoing pregnancy symptoms should be evaluated sooner given concern for ongoing pregnancy.

Second Trimester Medical Abortion

The majority of second trimester abortions are performed surgically. Second trimester medical abortions are performed through a variety of agents, including prostaglandin analogues such as misoprostol, mifepristone, oxytocin, and osmotic dilators, with success rates up to 91 % [4]. Rates of retained placenta, up to 8 %, are higher in second trimester medical

abortions than surgical ones [20]. Rates of infection, hemorrhage, and cervical laceration are low (1–2 %) and similar to second trimester surgical abortion [21]. While medical abortions at any gestational age are associated with more bleeding than surgical abortions, clinically significant hemorrhage is rare, and only 0.1 % of patients require transfusion [22].

First Trimester Surgical Abortion

Surgical abortion is a highly effective and safe method of pregnancy termination, with a complication rate of less than 1 % [23]. The success rate of first trimester surgical abortion is even higher than medical abortion, approximately 99 % [5]. Surgical abortions are generally performed with local anesthesia injected paracervically. Procedural sedation or general anesthesia may also be used.

Immediate complications after first trimester surgical abortion include bleeding or uterine perforation. Other complications, such as infection or delayed bleeding, can occur in the weeks following the procedure [23–25]. Hemorrhage after a surgical abortion can result from atony (loss of uterine contractile tone which normally serves to compress blood vessels and limit blood loss), retained products of conception, uterine perforation, cervical laceration, or, rarely, abnormal placentation. Most risk factors for cervical laceration, perforation, and atony are derived from studies of second trimester surgical abortions, with risk factors including prior cesarean sections, gestational age above 20 weeks, and nulliparity [26]. Absence of intraoperative ultrasound use is associated with retained products of conception after first trimester surgical abortions, which can present with postoperative hemorrhage or infection [27]. Abnormally adherent placental tissue that has invaded the myometrium, called a placenta accreta, is a very rare cause of hemorrhage following first trimester surgical abortion [28].

Hemorrhage may also result from coagulopathy—either preexisting (due to a congenital hematologic abnormality such as von Willebrand disease or use of anticoagulant medications) or acquired, most commonly disseminated intravascular coagulation (DIC), which is a coagulation and fibrinolysis

cascade leading to both diffuse thrombi and hemorrhage. Patients may develop DIC in the setting of with fetal demise (more often in the second trimester) prior to the procedure, or DIC may develop due to significant hemorrhage [29, 30]. Very rarely (3/100,000), DIC may result from an amniotic fluid embolism, which is a catastrophic complication in pregnancy with a very high associated mortality rate [31, 32].

Second Trimester Surgical Abortion

Unlike first trimester surgical procedures, which can generally be performed with mechanical cervical dilation alone, second trimester surgical abortions generally require additional cervical preparation with either osmotic dilators or prostaglandin analogues. Cervical preparation is generally initiated about 24 h prior to an abortion, but the timing can range from 2 to 48 h prior to surgical procedure [5]. After adequate cervical dilation is attained, the amniotic fluid, fetus, and placenta are removed. Most of these procedures can be performed in the outpatient setting [26].

The overall rate of complications from second trimester surgical abortions is low, approximately 1 % [29]. The range of possible complications is similar to first trimester surgical abortions, including uterine perforation or other uterine or cervical lacerations or trauma, post-procedural infection, and anesthesia complications. Hemorrhage occurs more commonly in second trimester surgical abortions than in first trimester surgical abortions, attributed to trauma to the gynecologic organs, atony, abnormal placentation, or DIC [26, 34]. The rates of hemorrhage and DIC are higher following second trimester surgical abortion in patients with two or more cesarean sections and 20 weeks of gestation or more [33]. Cervical laceration occurs in up to 3 % of second trimester abortions; risk factors include nulliparity, mechanical dilation, lack of sufficient dilation, and advanced gestational age [4, 33, 35]. Abnormal placentation is also a cause of hemorrhage after second trimester surgical abortion; the rate of placenta accreta, in which the placenta invades into the myometrium, is currently 0.3 % and rising due to the increasing rate of cesarean sections [36]. The

risk of abnormally adherent placenta is increased with each successive cesarean section, particularly in conjunction with a placenta previa (a placenta overlying the cervical os) [37].

After surgical abortion at any gestational age, a very rare cause of prolonged bleeding or delayed hemorrhage is a vascular malformation, which is thought to be induced by uterine curettage. The optimal imaging is ultrasound with color Doppler flow or angiography [38, 39]. Repeat instrumentation in the setting of a vascular malformation may lead to profuse hemorrhage; uterine vascular malformations are most often managed with embolization or hysterectomy, though spontaneous resolution has also been reported [39].

Differential Diagnosis

Pain

Infection
Hematometra
Uterine perforation/visceral injury
Ectopic pregnancy
Normal postabortion cramping

Vaginal Bleeding

Retained products of conception
Uterine perforation
Cervical laceration
Atony
Abnormal placentation
Coagulopathy (inherited, anticoagulant medication, DIC)

Vascular malformation
Menses (3–6 weeks after abortion)
Normally progressing medical abortion
Normal postabortion bleeding/spotting

Fever

Endometritis
Infected retained products of conception
Pyometra
Pulmonary embolism
Prostaglandin analogue effects
Anesthesia complication, including aspiration/pneumonia, medication reaction
Non-abortion related

When You Get the Call Ask for a set of vital signs. Ensure that basic labs (including a complete metabolic panel, complete blood count, coagulation factors, and a blood type) have been ordered in patients with reported heavy bleeding or vital sign abnormalities, and ensure that at least one peripheral IV has been placed.

When You Arrive Review the patient's vital signs in detail to assess for tachycardia or hypotension, and assess the patient's general appearance for signs of distress, including altered mental status, extreme pain, or obvious ongoing hemorrhage.

Recognition of sepsis and hemorrhage is vital to limiting morbidity and mortality; diagnostic criteria of sepsis are shown in Table 17.1, and the stages of hemorrhagic shock are shown in Table 17.2. Tachycardia, hypotension, tachypnea, and/or altered mental status may be associated with sepsis or hemorrhage [40–42]. Resuscitation of patients with severe sepsis or hemorrhage should begin in parallel with the exam and further investigation (see Management).

Table 17.1 Clinical criteria of sepsis and severe sepsis

Sepsis	Severe sepsis
Suspected source plus 2 or more: 1. Temperature >38.3 °C (101 °F) or <36 °C (96.8 °F) 2. Heart rate >90 beats per minute 3. Tachypnea (>20 breaths/min) 4. WBC >12,000 μ/L or <4,000 μ/L or normal with >10 % immature (band) forms	Sepsis plus one or more: 1. Systolic blood pressure <90 mmHg or decrease from baseline by 40 mmHg 2. Elevated lactate (>1 mmol/L; >4 particularly concerning, sign of organ hypoperfusion) 3. Acute lung injury: PaO_2/FiO_2 <250 (in the absence of pneumonia) or <200 (with pneumonia) 4. Acute oliguria: <0.5 mL/kg/h despite fluid resuscitation 5. Creatinine >2 mg/dL 6. INR >1.5 7. Platelets <100,000/uL 8. Bilirubin >2 mg/dL

Criteria from Fischerova [40]; Dellinger et al. [41]

History

The method and date of abortion should be reviewed, in addition to the patient's gestational age at the time of the abortion, and any factors complicating the pregnancy (such as placenta previa, which, in conjunction with a prior cesarean section, increases her risk for abnormally adherent placental tissue) [37]. Review whether an intrauterine pregnancy was ever definitively confirmed—by ultrasound, gross assessment of intrauterine contents at the time of surgical abortion, or on pathologic analysis—and if not, the patient is theoretically at risk of an ectopic pregnancy.

Table 17.2 Stages of hemorrhagic shock

Class I: blood volume lost <15 %	**Class II:** blood volume lost 15–30 %
Heart rate <100 beats per minute	Heart rate >100 beats per minute
Blood pressure normal	Blood pressure normal
Respiratory rate 14–20 breaths/min	Respiratory rate 20–30 breaths/min
Urine output >30 mL/h	Urine output 20–30 mL/h
Mental status normal	Mental status mildly anxious
Class III: blood volume lost 30–40 %	**Class IV:** blood volume lost >40 %
Heart rate >120 beats per minute	Heart rate >140 beats per minute
Blood pressure decreased	Blood pressure decreased
Respiratory rate 30–40 breaths/min	Respiratory rate >35 breaths/min
Urine output 5–15 mL/h	Urine output negligible
Mental status anxious/confused	Mental status confused/ lethargic
Often marks the onset of decompensated hypovolemic shock	

Committee on Trauma [41]

If the patient has been transferred to the emergency room from another care setting, either a surgical abortion center or other outpatient care center, review the interventions that have already been performed and medications already administered. Complications of surgical procedures should be reviewed from the medical record and/or with the patient or transferring clinician.

The use of prophylactic antibiotics with the abortion should be reviewed, including asking the patient whether she took prescribed antibiotics. Review whether the patient was prescribed contraception or whether indwelling contraception—such as an intrauterine device or progestin implant—was placed at the time of abortion, which may affect bleeding patterns and risk of a new pregnancy.

Review with the patient the time course of her presenting complaint and any associated symptoms, including nausea, vomiting, diarrhea, and purulent or foul-smelling vaginal discharge. Review whether she has been sexually active and how soon after her abortion.

The patient's full medical history should be reviewed, including sexually transmitted infections, thrombophilia or prior thromboembolism, bleeding disorders, prior episodes of bleeding after procedures or use of anticoagulant medications. In patients with bleeding, be sure to elicit a history of asthma and hypertension, which are contraindications to certain uterotonic medications. Review her surgical history, including prior abortions and cesarean sections.

Physical Examination

The physical exam is a key component of the assessment of women with possible postabortion complications. On abdominal examination, note the presence of peritoneal signs, including rebound (pain with abdominal pressure is quickly withdrawn) or involuntary guarding, which may indicate intra-abdominal infection, trauma, or hemorrhage.

On bimanual exam, assess for cervical motion or adnexal tenderness, and note the uterine size and tenderness [43]. Soon after medical or surgical abortions, patients are expected to have some degree of uterine and cervical tenderness, but providers should have a low threshold to treat a possible pelvic infection following abortion due to the reproductive sequelae. A large globular or boggy uterus may suggest hematometra or atony.

On speculum exam, make note of the amount of vaginal bleeding; if vaginal hemorrhage is present, use wall suction to assist with visualization. Assess for cervical or vaginal lacerations. Make note of purulent discharge, whether the cervical os is open or closed and the presence of products of conception at the cervical os, which should be extracted and sent for pathologic confirmation. Of note, if tissue in the cervix cannot be easily extracted, do not try to remove it; this tissue could represent abnormally adherent placental tissue, and extraction could lead to severe hemorrhage.

Diagnosis

In patients with fever or otherwise concerning for infection, a complete blood count with a differential should be obtained to assess for leukocytosis and the presence of bands. Of note, fevers in the first 24 h after an abortion may be related to administration of prostaglandin analogues such as misoprostol, but infection must be ruled out regardless [10]. Cervical cultures for gonorrhea and chlamydia are generally helpful. In patients with temperatures over 101 °F, blood and urine cultures should be obtained.

In patients with signs of sepsis, order electrolytes, creatinine, liver function tests, a blood type and antibody screen, coagulation studies (prothrombin time (PT), activated partial thromboplastin time (aPTT) and fibrinogen), and a lactate level. Consider an arterial blood gas if the patient is in distress. If a patient is septic and hemodynamically unstable, with the uterus being the most likely source of infection, it may be necessary to proceed to the operating room for reevacuation and potentially other exploratory procedures, without imaging.

Patients with hemorrhage must have a complete blood count blood type and antibody screen ordered, coagulation studies (PT and PTT), and a fibrinogen level. Ultimately, however, hemorrhagic shock can be diagnosed clinically, shown in Table 17.2. Notably, tachycardia is the first sign of

hemorrhage, and hypotension may not appear until 30–40 % of a patient's blood volume has been lost [42]. In patients with severe hemorrhage, resuscitation should begin alongside diagnosis. Resuscitation is discussed under Management below.

Beta-Human Chorionic Gonadotropin (hCG)

Serum or urine hCG is often sent for patients presenting after abortions to the emergency room and can be hard to interpret. The time to hCG resolution is dependent on serum levels at the time of abortion and ranges from 3 to 5 weeks; hCG may be present in the blood for as long as 60 days following uterine evacuation [44]. On average, menses should return by 6 weeks after an abortion, unless patients are using contraception that may suppress ovulation [45]. Patients may have resumption of menstruation despite residual hCG in the blood, as high as 35 milli-international units per milliliter (mIU/mL) [46].

In patients presenting after their abortion with pain or bleeding and a positive serum hCG, the possibility of an ectopic pregnancy should be considered, particularly if an intrauterine pregnancy was never confirmed (by ultrasound, by gross assessment of intrauterine contents at the time of surgical abortion, or on pathologic analysis). Alternatively, a new pregnancy should be considered, depending on the interval from the first abortion.

Imaging

For an unstable patient who had a very recent surgical abortion, waiting for a formal ultrasound is not recommended; instead, a focused assessment with sonography for trauma (FAST) scan can be performed for the rapid assessment of hemoperitoneum, which may be the result of uterine perforation and vascular injury [47].

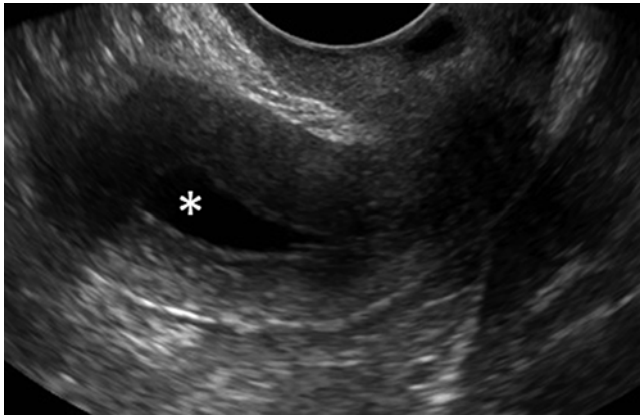

Fig. 17.1 Hematometra. Transvaginal ultrasound showing hematometra, indicated with an *asterisk* (*), and a thin endometrial lining

In a stable patient, pelvic ultrasound should be obtained to assess for hematometra—blood distending the uterus—retained products of conception and ongoing pregnancy (Fig. 17.1). Of note, ultrasounds have a false-positive rate of 34 % for retained products of conception, and Doppler flow may be present in the endometrial linings of patients who do not ultimately have retained productions of conception [17, 48]. Ultrasound might also show free fluid or complex free fluid in the pelvis if uterine perforation has occurred. If there is concern for uterine perforation, consider an upright abdominal radiograph to assess for intra-abdominal free air [43]. In patients with refractory pain not otherwise clarified by ultrasound, CT or MRI may diagnose perforations and incarceration of pelvic organs [49, 50].

Finally, any pregnant (or recently pregnant) patient is at increased risk of thromboembolism; tachycardia, hypoxia, and/or low-grade fever may also be presenting signs of pulmonary embolism. Please see Chap. 15 for the diagnosis and management of pulmonary embolism.

Management

Infection

In patients with signs of sepsis, resuscitation must begin immediately. In patients with potential evidence of infected retained products of conception or pyometra (purulence in the uterine cavity), surgical planning should also begin immediately, as delayed uterine evacuation places patients at risk of sepsis and death [51].

A patient should have two large-bore IVs and oxygen by high-flow facemask as needed. Antibiotics should be started within an hour of presentation. The patient should receive crystalloid resuscitation, with goals of a central venous pressure of 8–12 millimeters of mercury (mmHg), mean arterial pressure of at least 65 mmHg, urine output of greater than 0.5 mL/kg/h, superior vena cava oxygenation saturation or mixed venous oxygen saturation 70 % or 65 %, respectively, a normalized lactate level, and a hemoglobin level of 7–9 g/dL [41].

In patients with any evidence of septic physiology (see Diagnosis), intravenous broad-spectrum antibiotics are required. A common regimen is ampicillin (2–3 g IV every 6 h), clindamycin (900 mg IV every 8 h), and gentamicin (2 mg/kg IV one time, followed by 1.5 mg/kg IV every 8 h). Another option is ampicillin-sulbactam (3 g IV every 6 h) [52]. Tissue obtained from any uterine evacuation should be sent for culture to direct antibiotic selection [43].

For patients with mild endometritis, without evidence of retained products of conception or pyometra, management with oral antibiotics is reasonable, and recommendations are largely extrapolated from guidelines for postpartum endometritis. Options include amoxicillin-clavulanic acid alone (875 mg PO every 12 h) or amoxicillin (500 mg PO every 8 h) plus metronidazole (500 mg PO every 8 h) [53]. Clindamycin can also be given orally (600 mg every 6 h), and gentamicin can be given intramuscularly (4.5 g every 24 h), which is less convenient but feasible if no other options are available. Of note, chlamydia and gonorrhea is not addressed by this regimen, and testing for these bacteria should be sent [54].

Hemorrhage

Particularly in patients with hemodynamic changes or estimated blood loss of 500 mL or more, resuscitation efforts should immediately start, with crystalloid and packed red blood cells as necessary. For massive transfusion (>10 units of packed red cells), administer units of red blood cells, fresh frozen plasma, and platelets in 1:1:6 ratio (extrapolated from trauma literature) [55–57]. Resuscitation goals include a heart rate below 100 beats per minute, hemoglobin of at least 7 g/dL, platelets above 50,000 per μL, fibrinogen above 100 mg/dL, and an INR less than 1.5. Please see Chap. 13 for more information on resuscitation and blood products.

Management is directed to the suspected source of bleeding (Fig. 17.2). For superficial cervical lacerations, silver nitrate or ferric subsulfate (Monsel's) can be applied, followed by holding pressure with a sponge stick [26]. More significant lacerations may require repair with absorbable

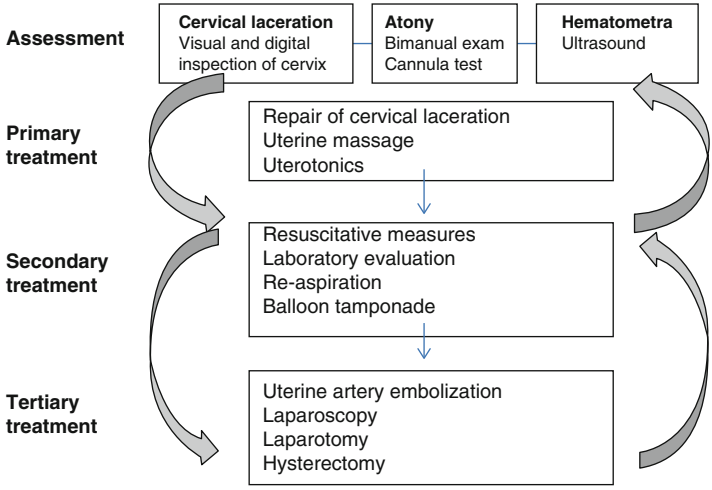

Fig. 17.2 Interventions for vaginal hemorrhage (Reprinted from Kerns and Steinauer [26], with permission from Elsevier and the Association of Reproductive Health Professionals and the Society of Family Planning)

Table 17.3 Uterotonic medications

Medication	Comment
Misoprostol 800–1000 μg PO, SL, PV or PR	Peak serum concentration of misoprostol is lower following rectal administration
Oxytocin 10 units IM or 10–40 units IV in 1 L of normal saline or lactated Ringer's	Not helpful in the first trimester
Methylergonovine maleate (Methergine®, Novartis, East Hanover, New Jersey) 0.2 mg IM every 2–4 h, or PO every 6–8 h	Contraindicated in patients with hypertension
Carboprost tromethamine (Hemabate®, Pfizer, New York, NY) 0.25 mg IM every 15–90 min, maximum 8 doses	Contraindicated in patients with asthma or suspected amniotic fluid embolism

From: O'Connell et al. [59]; American College of Obstetricians and Gynecologists [60]; Nygaard et al. [70]
PO oral, *SL* sublingual, *PV* vaginally, *PR* rectally, *IM* intramuscular

sutures. If bleeding continues after repair of any lacerations, uterine massage should be initiated, and uterotonics should be administered, shown in Table 17.3 [58–61]. If the patient has been transferred to the emergency room immediately following a surgical abortion, many of these interventions have likely already been performed by the clinicians performing the termination, and should be reviewed to avoid excessive medication administration.

If the patient is symptomatic and imaging suggests retained products of conception or hematometra, the patient requires reaspiration. If reaspiration is not indicated, or the bleeding continues despite reintervention, and/or atony is suspected, lower uterine segment tamponade can be established with a Foley catheter or Bakri® balloon (Cook Medical, Bloomington, IN), inflated with normal saline [33, 62, 63]. Foley catheter balloons can be inflated to double their usual volume as needed.

Bakri balloons, which can hold 500 mL, may be too large for the uterine cavity following an abortion; at most half the maximum volume is sufficient in the postabortion setting [26]. Patients should be closely observed after placement to assess for bleeding around the balloon or excessive bleeding through the central channel draining the uterus. Bedside ultrasound may also be helpful to assess whether the uterus is distended with blood around the balloon. If tamponade is curative, the balloon can stay in place for 12–24 h, with or without uterotonics and antibiotics [26].

For refractory bleeding, patients require additional interventions, including uterine artery embolization (UAE), laparoscopy, laparotomy, or rarely hysterectomy. UAE involves the cannulation of the femoral artery followed by catheter-guided delivery of embolic particles to the uterine arteries. Uterine artery embolization has been used with great success to treat postabortion atony, lacerations, and abnormal placentation (Fig. 17.3) [34]. It is a relatively low-risk and well-tolerated procedure, though can result in significant cramping; complications include groin puncture site hematoma, contrast allergy, or accidental embolization of vessels in the pelvis or leg [64]. UAE is not currently recommended in patients desiring future fertility, but may be required to avoid surgical intervention or hysterectomy.

If interventional radiology is not available, surgical intervention may be required. Uterine artery ligation and/or uterine compression (B-lynch) sutures are additional possible interventions for hemostasis at the time of surgery [26]. Hypogastric artery ligation, historically performed for postpartum hemorrhage, may be an option as well [65]. For refractory bleeding, hysterectomy may be required. In the United States, 1.4 in 10,000 abortions require hysterectomy [66].

Uterine Perforation

Patients may be referred to emergency rooms by their abortion providers due to suspicion that uterine perforation occurred during suction curettage or tissue extraction with

Fig. 17.3 Uterine artery embolism for postabortion hemorrhage. Following a late second trimester surgical abortion complicated by bleeding refractory to uterotonics and tamponade, angiography revealed a laceration of the right uterine artery (*circled*) which was successfully embolized

forceps; in these cases, surgical intervention is required. Abdominal exploration is not strictly required if perforation occurred using blunt instruments. In hemodynamically stable patients with a mechanism of perforation concerning for visceral injury, laparoscopy can be performed for assessment of the intra-abdominal cavity. A hemostatic uterine perforation detected at the time of laparoscopy does not require repair [67]. If perforation is confirmed, the bowel and other pelvic organs should be carefully inspected for damage. This may require general surgery or other advanced surgical consultation, particularly for laparoscopic procedures.

Hematometra

Patients with hematometra may present with vasovagal symptoms, including hypotension, bradycardia, and/or diaphoresis, as well as lower abdominal pain, vaginal bleeding, and nausea [68]. In patients presenting with symptomatic hematometra, even in the absence of hemorrhage or infection, prompt surgical evacuation is recommended. Administration of methylergonovine maleate (Methergine®, Novartis, East Hanover, New Jersey) may prevent reaccumulation, including orally (0.2 mg PO every 6–8 h) for a short interval afterward, though data are sparse [69].

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