

Peripartum hysterectomy for management of hemorrhage

INTRODUCTION

Peripartum hysterectomy can be defined as a hysterectomy performed at the time, or within 24 hours, of delivery. Another definition is a hysterectomy performed any time from delivery to discharge from the same hospitalization. This topic will review the surgical planning, key operative points, and postoperative care for peripartum hysterectomy.

Related topics can be found separately and include:

(See "Abdominal hysterectomy")

(See "Overview of preoperative evaluation and preparation for gynecologic surgery.")

EPIDEMIOLOGY AND RISK FACTORS

Based on population level data, the peripartum hysterectomy rate is nearly 1 per 1000 deliveries (eg, 0.1 percent) in the United States U. In addition to abnormal placentation, other significant risk factors for peripartum hysterectomy include advanced maternal age and parity, multiple gestations, antepartum bleeding, preeclampsia, bleeding disorders, and the use of assisted reproductive technologies (2-7). Secondary analysis of a large, multicenter postpartum hemorrhage trial reported that abnormal placentation was the most common cause of hysterectomy and that advanced maternal age and delivery by cesarean section were significant risk factors [8]. While the majority of patients with these risk factors will experience neither major hemorrhage or hysterectomy patients who have multiple risk factors or a history of prior postpartum hemorrhage should deliver in a setting where hysterectomy is readily available if needed.

INFORMATION FOR PATIENTS

UpToDate offers two types of patient education materials, "The Basics" and "Beyond the Basics." The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview

and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading level and are best for patients who want in depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on "patient info" and the keyword(s) of interest.)

- Basics topic (see "Patient education: Postpartum hemorrhage ")The Basics

SUMMARY AND RECOMMENDATIONS

- For patients in whom the abdomen is not already open for Cesarean delivery, we suggest a midline abdominal incision for treatment of postpartum hemorrhage (PPH). For those undergoing or with completed cesarean delivery, extension of the existing Incision is more appropriate. (See Evaluation of the abdomen' above.)
- In hemodynamically unstable patients, temporizing maneuvers to reduce bleeding should be attempted prior to performing surgical procedures that take significant time to control hemorrhage. The option chosen depends on the urgency to control bleeding, the source of bleeding (intrauterine versus extrauterine), and the surgeon's expertise and preference:
- Manual aortic compression (in highly urgent settings) (see "Manual aortic compression' above)
- Intrauterine balloon tamponade (see "Intrauterine balloon tamponade' above)
- Ligation of the uterine and utero ovarian arteries (see 'Ligation of uterine and utero ovarian arteries' above)
- Pelvic pack (see 'Pelvic packing above)
- Clamp across utero ovarian ligaments (note: will occlude fallopian tubes) (see 'Clamp across utero ovarian ligaments' above)
- Internal iliac artery ligation (procedure of last resort) (see "Role of internal iliac (hypogastric) artery ligation' above)

- Intraoperative blood salvage may be arranged before laparotomy or requested during laparotomy, but its use is Investigational in the obstetric setting. (See 'Role of intraoperative cell salvage above.)
- Bleeding from a hysterotomy incision can generally be controlled by suture ligation. The angles of a transverse incision should be clearly visualized to ensure that they, and any retracted vessels, are completely ligated. If possible, the Ipsilateral ureter should be identified before the bleeding is controlled and, once the hemorrhage has been controlled, the integrity of the ureter should be ensured. (See 'Myometrial lacerations' above.)
- Bilateral ligation of the uterine vessels (O'Leary stitch) is the preferred approach for controlling PPH from laceration of the uterine artery or branches of the utero-ovarian artery. If this does not control bleeding, the vessels of the uteroovarian arcade are similarly ligated. (See 'Laceration of the uterine artery or utero ovarian artery branches' above.)
- The interventions for reduction and control of bleeding due to atony are applied in rapid sequence until bleeding is controlled, which may be the result of the cumulative combined effect of multiple interventions. If uterine atony persists despite uterine massage and administration of uterotonic drugs and tranexamic acid, we suggest rapidly moving on to placement of uterine compression sutures, which are an effective method for reducing uterine blood loss related to atony. Manual compression of the uterus, insertion of an intrauterine balloon for tamponade, placement of a uterine tourniquet, and/or ligation of the uterine and utero-ovarian arteries can reduce ongoing heavy blood loss before attempting the procedure, and may obviate the need for the compression sutures. (See Aton above.)
- Identification of an Isolated bleeding point in the retroperitoneum is often impossible so it is rarely advisable to open the retroperitoneum or attempt dissection of any nonexpanding retroperitoneal hematoma or an expanding retroperitoneal hematoma in a coagulopathic, hemodynamically unstable patient. Temporizing procedures can be used to stabilize the patient before beginning retroperitoneal surgery. (See 'Retroperitoneal bleeding above.)
- Management of PPH from placental abnormalities, including preoperative placement of balloon catheters by an interventional vascular specialist, are reviewed separately. (See

"Placenta previa: Management and Management of the placenta accreta spectrum (placenta accreta, increta, and percreta.)

- Early resort to hysterectomy is appropriate in women with severe bleeding due to diffuse placenta accretalincreta Ipercreta or a large uterine rupture. Hysterectomy is generally a last resort in patients with atony, but should not be delayed in those who have severe coagulopathy and require prompt control of uterine hemorrhage to prevent death. (See 'Role of hysterectomy' above.)

- Patients with persistent severe hemorrhage can enter a lethal downward spiral characterized by hypothermia, coagulopathy, and metabolic acidosis. To abort the cycle, the bleeding area is tightly packed, and the skin temporarily closed while the patient is actively warmed and resuscitated. She should not be moved from the operating room until the bleeding has been controlled and she is hemodynamically stable. She should then be transferred to an intensive care unit for continuous monitoring, ongoing replacement of appropriate blood products, and correction of physiologic derangements. (See 'Damage control approach for persistent bleeding after hysterectomy above.)

- The main settings when embolization may be indicated are (see "Role of embolization above):

- At laparotomy, when persistent nonlife threatening deep pelvic bleeding occurs after repair of lacerations or hysterectomy and cannot be controlled by surgical ligation or ablation, Embolization is an option of the facility has an appropriately equipped operating room (hybrid operating room, or an appropriately sensitive portable Carm and carbon fiber table).

- After laparotomy, when persistent slow internal bleeding is suspected in a hemodynamically stable patient. The stable patient can be transferred to the interventional radiology suite for a diagnostic angiogram and embolization (if a bleeding source is seen). Hemodynamically unstable patients should be evaluated in the operating room, not the interventional radiology suite, unless the facility has an appropriately equipped operating

room. Laparotomy is performed if the patient deteriorates during evaluation and embolization or the embolization fails.

. In patients with placenta accreta spectrum. (See "Management of the placenta accreta spectrum (placenta accreta, increta, and percreta.)

SURGICAL PLANNING

The procedure may be planned or performed in an emergency situation. The most common Indication for emergency procedures is severe uterine hemorrhage that cannot be controlled by conservative measures. Such hemorrhage is most commonly due to abnormal placentation or uterine atony, with each accounting for 30 to 50 percent of peripartum hysterectomies (9.12). Other potential causes include uterine rupture, leiomyomas, and laceration of uterine vessels 14.131. Planned per partum hysterectomy may be performed in patients with an antepartum diagnosis of placenta accreta, or more rarely for stage IA2 and 181 cervical carcinoma or very large fibroids (14.15). Infection appears to be an important contributor to per partum hysterectomy. Not only is severe postpartum pelvic infection a potential indication for the procedure, but uteri removed for atony also show a relatively high rate of infection and Inflammation on pathologic analysis (14).

The obstetrician should be prepared for the potential need to perform emergency per partum hysterectomy, especially in patients with significant risk factors or heavy postpartum bleeding. Hysterectomy is not commonly performed on labor and delivery units, depending on local operating room resources, a general operating room may be necessary. An Institution-specific labor and delivery unit checklist of equipment, other supplies, and action items that will be needed in the event of emergency hysterectomy can be helpful table 1

In emergency situations, a sequence of conservative measures to control uterine hemorrhage should be attempted before resorting to more radical surgical procedures(table 2). If an intervention does not succeed, the next treatment in the sequence should be swiftly instituted. Conservative measures should be employed with the goal of avoiding the morbidity and sterilization that comes with hysterectomy. For those patients who inevitably

require hysterectomy, Immediate performance of the procedure (without using multiple conservative measures) leads to a lower transfusion requirement and possibly less morbidity (16). Moreover, there is increased blood loss with increased duration of time before performance of hysterectomy. Thus, conservative measures should be used in quick succession and preparation for hysterectomy should begin promptly in cases of massive hemorrhage or maternal instability. (See "Overview of postpartum hemorrhage")

Preoperative risk assessment Sometimes the obstetrician can anticipate the possible need for per partum hysterectomy based on the patient's risk factors. This enables patient Preparation and counseling in the antenatal period, detailed surgical planning, and possibly avoidance of an emergency procedure. This is true primarily for women with abnormal placentation.

Most patients with placenta accreta, increta, or percreta will undergo hysterectomy at delivery (79 of 133 patients (60 percent) in one study [17]). Placenta previa is associated with an approximately 5 percent risk of hysterectomy, usually in cases with placenta accreta (18). The frequency of abnormal placentation rises substantially as the number of prior cesarean deliveries increases, as well as with maternal age 1191. (See "Placenta previa Management and "Management of the placenta accreta spectrum placenta accreta, Increta, and percreta section on Cesarean hysterectomy)

Even in the absence of abnormal placentation, cesarean delivery, as well as prior uterine surgery, appears to be a risk factor for peripartum hysterectomy 12.3.20). In a populationbased, case-control study, the risk of peripartum hysterectomy was lowest in women undergoing a first delivery that was vaginal (1 in 30,000) and highest in women with a history of two or more prior cesarean deliveries (1 in 220) (21). In a study of 30,000 women undergoing cesarean delivery, the risk of peripartum hysterectomy was <1 percent for the first second, or third cesareans: 2 to 4 percent for the fourth and fifth procedures, and 9 percent after six or more cesareans (20). While abnormal placentation contributes to hysterectomy risk with repeat cesareans, it is unclear whether the increased risk with primary cesarean delivery relates to the surgery itself, or reflects the indication for cesarean. Indications such as abruption, Infection, macrosomia, or multiple gestations are risk factors

themselves for hemorrhage and/or uterine atony. Alternatively, providers may move more quickly to hysterectomy for management of hemorrhage in patients whose abdomen is already open. (See "Overview of postpartum hemorrhage" section on 'Physiologic mechanisms that limit postpartum blood loss and "Overview of postpartum hemorrhage" section on 'Risk factors and specific etiologies.)

Patient counseling-Patients at risk for emergency peripartum hysterectomy should be counseled about the likelihood of the procedure and how the decision to proceed with hysterectomy will be made. Patients at risk and those with planned procedures should understand what the procedure involves, complications and outcomes of hysterectomy, and Issues related to ovarian conservation. The patient should also be aware of the possible need for blood transfusion, mechanical ventilation, and recovery in an intensive care unit rather than a postpartum floor.

Scheduling delivery of patients at high risk for cesarean hysterectomy - Patients high risk of needing cesarean hysterectomy should be scheduled for delivery at a time when surgical staff and resources are immediately available, preferably avoiding an emergency delivery after the onset of labor. Surgical scheduling and consultations should be arranged with appropriate ancillary staff, which may include high-risk anesthesiologists, interventional radiologists, gynecologic Oncologists, and urologists, depending on the complexity of the case. The primary surgeon should have significant experience with pelvic surgery and hysterectomy. Transfer of care to a tertiary care center may be necessary if these resources are not locally available.

Total versus supracervical hysterectomy-In scheduled gynecologic surgery, there are no proven medical or Surgical benefits of performing supracervical or subtotal hysterectomy if the cervix can be easily removed with the corpus (see "Choosing a route of hysterectomy for benign uterine disease. section on Supracervical subtotal) hysterectomy). However in obstetric cases, supracervical hysterectomy may be preferable because removal of the cervix can be particularly challenging when the cervix is significantly dilated. In addition, supracervical hysterectomy may decrease total blood loss and operative time, which is Important in the setting of severe acute hemorrhage. As a general guide, the cervix should

be removed if cervical injury or bleeding is contributing to the hemorrhage, or if a previa/accreta may be invading the cervical stroma (often, this cannot be known with certainty until a pathologic analysis is performed. It is important to ensure that the entire placental bed has been removed in cases of placenta previa, which may require total hysterectomy or partial trachelectomy.

In a large study using data from the National Inpatient Sample, total hysterectomy was associated with more bladder and other" (non-gastrointestinal, vascular, or ureteral) Injuries, as well as more pulmonary complications and transfusion, but supracervical hysterectomy had higher rates of reoperation and perioperative death (23). Although a retrospective cohort study reported no significant increase in complication rates when the cervix was removed after emergency cesarean delivery, surgical times were nearly identical with or without cervical removal, suggesting that the supracervical procedures may have been more complicated overall and that aborting cervical removal may have avoided excess morbidity.

Placement of hypogastric artery balloon catheters - The author does not place preoperative arterial catheters routinely before planned puerperal hysterectomies, given Mittle evidence of benefit and concern for complications; however, practice patterns vary among providers. In selected cases, intraoperative uterine artery embolization may be