# POSTPARTUM HEMORRHAGE

MULUKEN G.

# *Outline*

- Introduction
- Define PPH
- Classification
- Clinical presentation
- Risk factors for PPH
- Etiologies of PPH
- Complications
- Management  principeles of PPH

# INTRODUCTION

- *Obstetrical hemorrhage is one of the leading causes of maternal morbidity and mortality throughout the world*
- It is responsible for 15% to 25% of all pregnancy-related deaths.
- *Postpartum hemorrhage is an obstetrical emergency that can follow vaginal or cesarean delivery*.

# *Cont'd.*

- *The risk of dying from PPH depends not only on the **amount** and **rate** of blood loss but also the **health status** of the Woman.*
- *Poverty, lifestyle, malnutrition, and women's lack of decision-making power to control their own reproductive health are some of the broad issues that have unfortunately come to be accepted as inevitable and unchangeable.*

# *Cont'd.*

- Two-thirds of women who experience it have no identifiable clinical risk factors
- In this regard, PPH is a veritable **equal-opportunity occurrence.**
- However, it is not an **equal-opportunity killer** because it is the poor, malnourished, unhealthy woman who delivers away from medical care who will die from it.
- Whereas those who are fortunate enough to deliver in a well-supplied and staffed medical facility most likely will survive three delays at the actual time of birth: delay in the decision to recognize a complication and seek help; delay in accessing transportation to reach a medical facility, and, finally, delay in receiving adequate and comprehensive care upon arrival.

# *Cont'd.*

**INCIDENCE** :

- *The incidence of PPH varies widely, depending upon the criteria used to define the disorder.*
- *A reasonable estimate is 1 to 5 percent of deliveries.*

# DEFINITION

- *PPH is best defined and diagnosed clinically as excessive bleeding that makes the patient symptomatic (eg, pallor, lightheadedness, weakness, palpitations, diaphoresis, restlessness, confusion, air hunger, syncope) and/or results in signs of hypovolemia (eg, hypotension, tachycardia, oliguria)*

❖Other definitions :

- *Estimated blood loss ≥500 mL after vaginal birth or ≥1000 mL after cesarean delivery.*

*- The inadequacy of this definition was illustrated in studies that showed clinicians were more likely to underestimate than overestimate the volume of blood lost .*

# *Cont'd.*

- *10 percent decline in postpartum hemoglobin concentration from antepartum levels.*

➢ *However, this is not a clinically useful definition:*

*- rapid blood loss may trigger a medical emergency prior to observation of a fall in hemoglobin concentration;*

*- laboratory changes that are not correlated with events that endanger the patient should not be used to define a medical emergency*

# PHYSIOLOGIC ADAPTATION TO HEMORRHAGE

- *Uterine bleeding after delivery is controlled by a combination of*

  *(1) contraction of the myometrium, which constricts the blood vessels supplying the placental bed, and*

  *(2) local decidual hemostatic factors, including tissue factor type-1 plasminogen activator inhibitor and systemic coagulation factors (eg, platelet and circulating clotting factors).*

# Classification

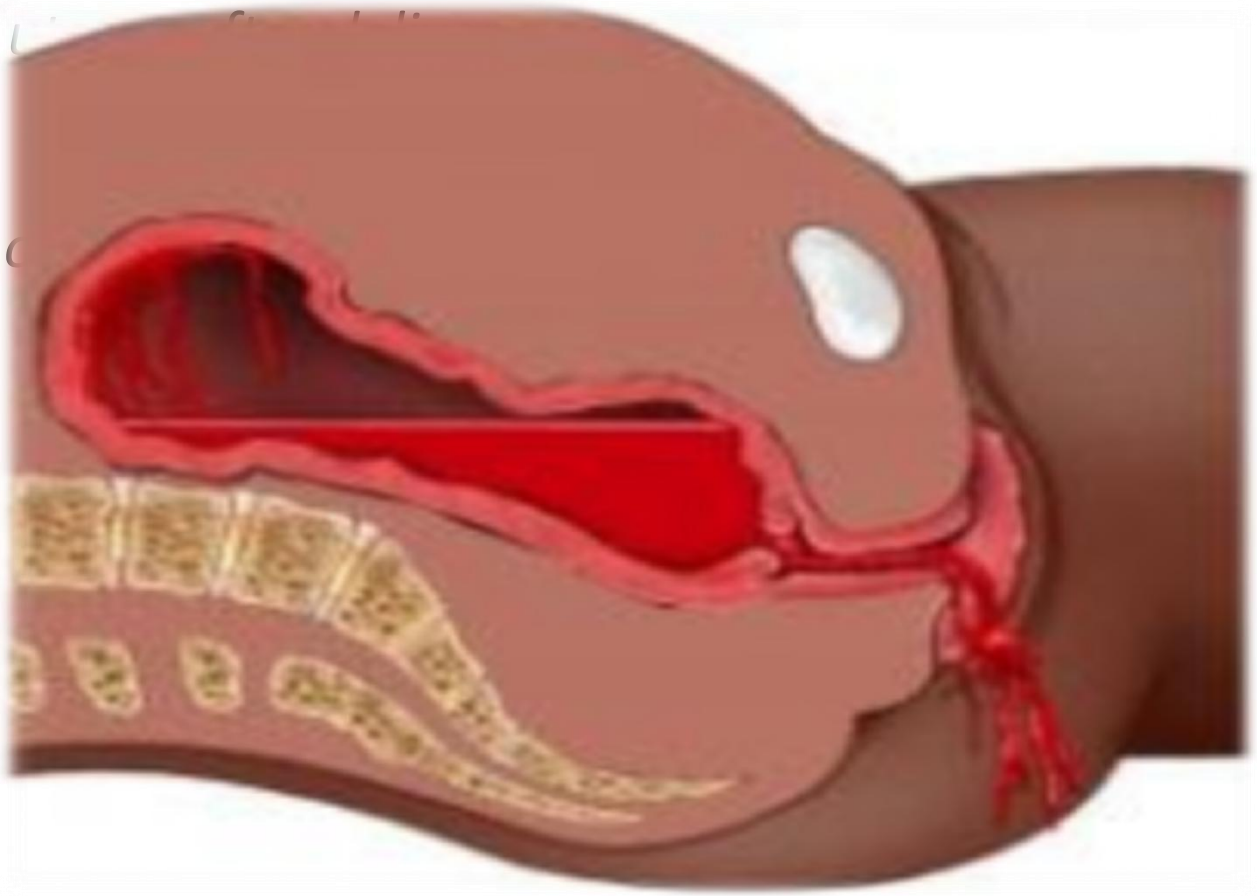
- ***Primary(early )PPH*** *: occurs within 24 hours after delivery .*
- ***Secondary(late) PPH****: occurs 24 hours to 6weeks after delivery.*

# Etiologies

- *Uterine atony*
- *Genital tract laceration*
- *Retained Placental Tissue*
- *Uterine inversion*
- *Coagulation Defects*

# ATONY

- *It is lack of effective contraction of the*
- *It is the most common cause of PPH .*
- *It is responsible for at least 80 percent*



# RISK FACTORS

- *Overdistension (multiple gestation, polyhydramnios, macrosomia)*
- *Uterine infection*
- *Drugs (uterine relaxants E.g tocolytic therapy, halogenated anesthetics)*
- *"Uterine fatigue" after a prolonged or induced labor*
- *Grand multiparity*
- *Retained placenta or placental fragment (either a normally attached placenta or placenta accreta)*
- *placenta previa*

# *Cont'd.*

**DIAGNOSIS:**

- *Uterine atony is diagnosed clinically by rapid vaginal bleeding associated with a **lack of myometrial tone** and an absence of other etiologies for postpartum hemorrhage.*

**PREVENTION:**

***Two preventive methods***

- *Active management of the third stage of labor and*
- *Spontaneous placental separation after cesarean delivery.*

# Cont'd.

- *Active management of the third stage of labor includes early cord clamping, administration of uterotonic therapy before placental separation controlled cord traction,and uterine massage*
- *Spontaneous separation of the placenta during cesarean delivery is also associated with reduced blood loss.*
- *If the uterus appears to be firmly contracted after delivery, then other etiologies of hemorrhage should be considered.*

# Genital tract laceration

- *Genital tract lacerations are the second leading cause of PPH.*
- *Can be due to lacerations (perineal, vaginal, cervical, uterine), incisions ( episiotomy), or uterine rupture.*
- *Lacerations are more common after difficult instrumental delivery.*

# Risk factors

- *Instrumental vaginal delivery*
- *Fetal malpresentation*
- *Fetal macrosomia*
- *Episiotomy*
- *Precipitated delivery*
- *Shoulder dystocia*

# CLINICAL MANIFESTATIONS

- *A genitourinary tract laceration should be suspected if bleeding persists after delivery despite adequate uterine tone.*
- *Occasionally, the bleeding may be masked because of its location, that is, the broad ligament.*
- *In these circumstances, large amounts of blood loss may occur in an unrecognized hematoma.*
- *Pain and hemodynamic instability are often the primary presenting symptoms.*

# *Cont'd.*

❑**Diagnosis:**

➢*Evaluate the lower genital tract starting superiorly at the cervix and progressing inferiorly to the vagina, perineum, and vulva.*

❑*First-degree laceration involves the fourchet, the perineal skin, and the vaginal mucous membrane.*

❑*Second-degree laceration also includes the muscles of the perineal body. The rectal sphincter remains intact.*

❑*Third-degree laceration not only extends through the skin, mucous membrane, and perineal body but also includes the anal sphincter.*

❑*Fourth-degree lacerations extends through the rectal mucosa.*

# Retained Products of Conception

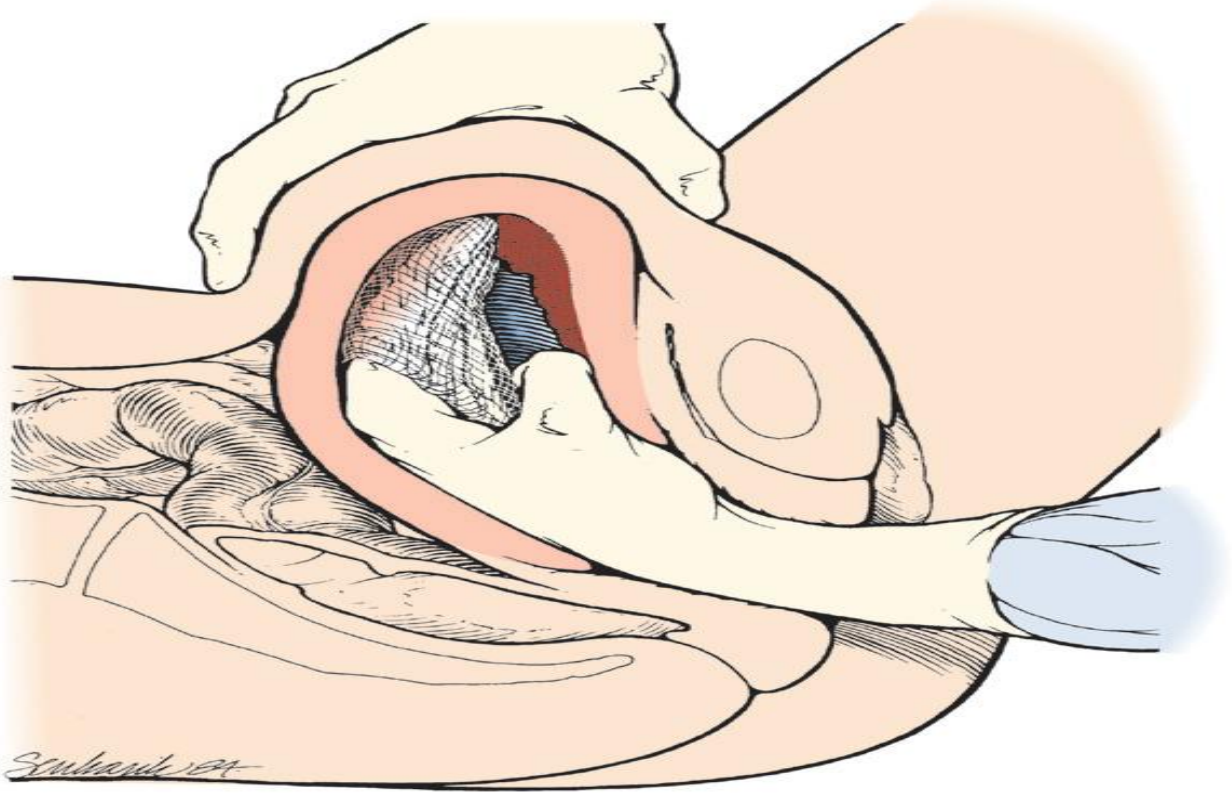
- *Retained placental tissue and membranes cause 5–10% of postpartum hemorrhages.*
- *The diagnosis is made when there has not been spontaneous expulsion of the tissue within 30 to 60 minutes of delivery*.

# Risk factors

- *Mismanagement of the third stage of labor*
- *Accessory placental lobes*
- *Adhesion of the placenta(morbidly adherent placenta)*

# *Cont'd.*

- *Retained products of conception typic associated atony.*
- *To assess the uterus for retained produ needs to be explored.*
- *Manual exploration is not only diagno*

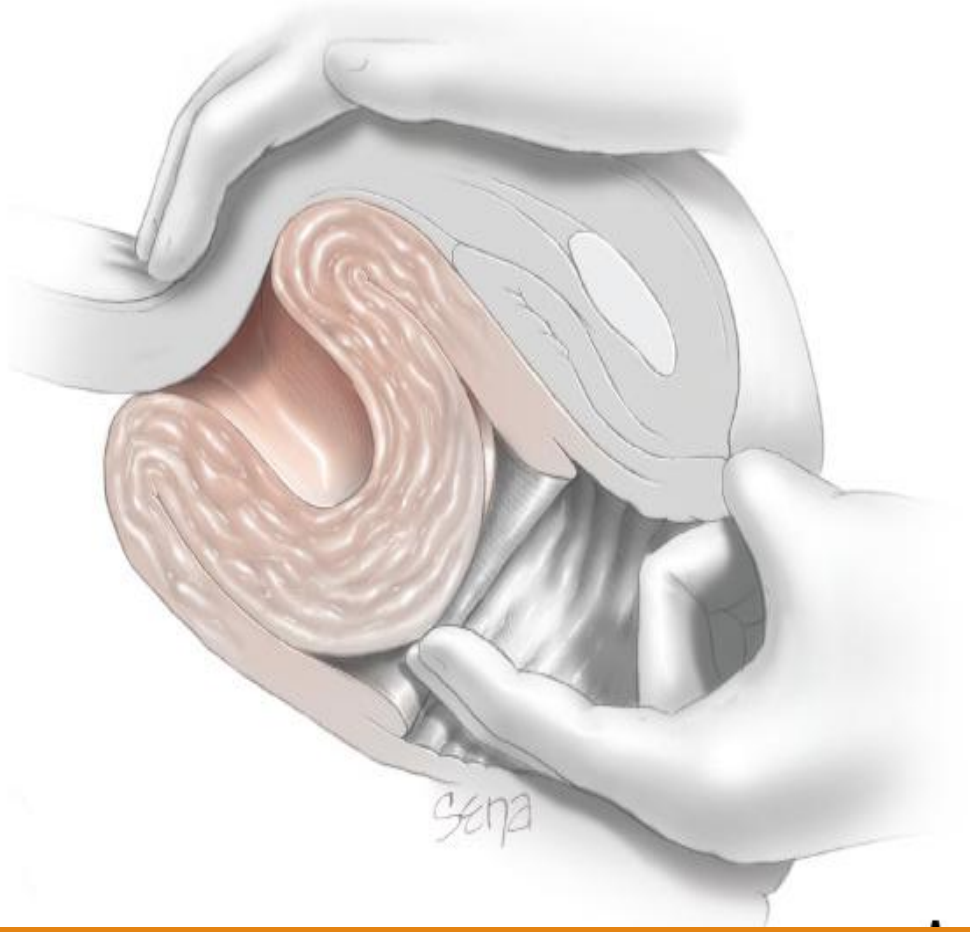


# Uterine Inversion

- *Is collapses of Uterine fundus into the*

**CLASSIFICATION:**

- *Uterine inversions are classified in ter inversion:*



# *Cont'd.*

**Degree:**

- *Incomplete: the fundus lies within the endometrial cavity.*
- *Complete: the fundus protrudes through the external cervical os.*
- *Prolapsed: the fundus extends to or through the introitus.*

**Timing:**

- *Acute : ≤24 hours of delivery)*
- *Subacute: >24 hours postpartum*
- *Chronic :>1 month postpartum*

# *Cont'd.*

***Etiologies** :*

- *Excessive umbilical cord traction with a fundally attached placenta .*
- *Fundal pressure in the setting of a relaxed uterus.*
- *Chronic inversion may result from an acute inversion left unrecognized or from a sub mucous fibroid which has prolapsed through the cervix.*

# Cont'd.

- *Uterine inversion should be suspected with the sudden onset of brisk vaginal bleeding in association with the inability to palpate the fundus abdominally and maternal hemodynamic instability.*
- *It may occur before or after placental detachment.*
- *The diagnosis is made clinically with bimanual examination, during which the uterine fundus is palpated in the lower uterine segment or within the vagina.*
- *U/S is used to confirm the diagnosis if the clinical examination is unclear.*

# Coagulopathy

- *It represents an imbalance between the clotting and fibrinolytic systems.*
- *Acquired and congenital bleeding diatheses may be associated with thrombocytopenia and/or hemostatic defects.*
- *Acquired causes include HELLP syndrome, abruptio placentae, IUFD, and sepsis*
- *The primary clinical manifestations of consumptive coagulopathy include bleeding, hypotension out of proportion to blood loss*
- *Consumptive coagulopathy is a clinical diagnosis that is confirmed with laboratory data, such as thrombocytopenia, decreased fibrinogen, elevated fibrin degradation products, and prolonged prothrombin time (PT) and activated partial thromboplastin time (aPTT).*

# COMPLICATIONS

- *Shock*
- *Renal failure*
- *Sheehan's syndrome :Is a rare, but potentially life threatening complication.*
  - *They will present with manifestations of hypopituitarism*
- *Failure to lactate, amenorrhea/oligomenorrhea, hypotension,hyponatremia, hypothyroidism.*
- *This symptoms can occur anytime from the immediate postpartum period to years after delivery.*

# MANAGEMENT

❑**General preventive measures** :

➢*Fundal massage*

➢*Routine use of uterotonic drugs for active management of the third stage of labor*

➢*Patients with risk factors for PPH should be identified and counseled.*

*Ensure availability of resources that might be needed, including personnel, medication, equipment, and blood products.*

# *Cont'd.*

- *Involve many teams within the hospital (obstetricians, nurses, anesthesiologists, blood bank personnel, laboratory personel) .*
- *The goal is to:*
  - *Restore or maintain adequate circulatory volume to prevent hypoperfusion of vital organs.*
  - *Restore or maintain adequate tissue oxygenation.*
  - *Reverse or prevent coagulopathy.*

# *Cont'd.*

1. *Call for help;*

- *PPH is a team work*

*2. Initiate resuscitation & monitoring*

- *open two iv lines*
- *take blood for x-matching, hgb, CBC, coagulation studies*
- *Commence crystalloids infusion, Monitor v/s, Measure urine output*

# *Cont'd.*

*3. Look for the cause;*

- *check the tone of the uterus, Completely inspect the cervix , vagina, perineum and vulva, Carefully explore the uterine cavity, Observe blood for clotting to rule out coagulopathy*

*4.Treat according to the cause*

# *Specific Management*

## *Uterine Atony*

**Medical management;**

- *Massage the uterus; The fundus should be massaged vigorously for at least 15 seconds and continued until the uterus remains firm and bleeding has abated. Massage should be maintained while other interventions are being initiated.*
- *Uterotonic therapy*

# *Uterotonic therapy*

| AGENT | DOSE | ROUTE | DOSING INTERVAL | SIDE EFFECTS | CONTRAINDICATIONS |
|---|---|---|---|---|---|
| Oxytocin (Pitocin) | 10-80 U in 1000 mL crystalloid solution | First line: IV<br>Second line: IM or IU | Continuous | Nausea, emesis, water intoxication | None |
| Misoprostol (Cytotec) | 200-1000 mcg | First line: PR<br>Second line: PO or SL | Single dose | Nausea, emesis, diarrhea, fever, chills | None |
| Methylergonovine (Methergine) | 0.2 mg | First line: IM<br>Second line: IU or PO | Every 2 to 4 hr | Hypertension, hypotension, nausea, emesis | Hypertension, preeclampsia |
| Prostaglandin $F_{2\alpha}$ (Hemabate) | 0.25 mg | First line: IM<br>Second line: IU | Every 15 to 90 min (maximum of 8 doses) | Nausea, emesis, diarrhea, flushing, chills | Active cardiac, pulmonary, renal, or hepatic disease |
| Prostaglandin $E_2$ (Dinoprostone) | 20 mg | PR | Every 2 hr | Nausea, emesis, diarrhea, fever, chills, headache | Hypotension |

*IM*, Intramuscular; *IU*, intrauterine; *IV*, intravenous; *PO*, per oral; *PR*, per rectum; *SL*, sublingual.

# *Cont'd.*

- **Oxytocin**

- *Is usually given as a first-line agent.*
- *Intravenous therapy is the preferred route of administration, but intramuscular and intrauterine dosing is possible.*
- *Initial treatment starts with 10 to 20 U of oxytocin in 1000 mL of crystalloid solution.*
- *Higher doses up to 80 units in 1000 ml can be infused intravenously for a short duration (eg, over 30 minutes) .*
- *When oxytocin fails to produce adequate uterine tone , second-line therapy must be initiated.*

# *Cont'd.*

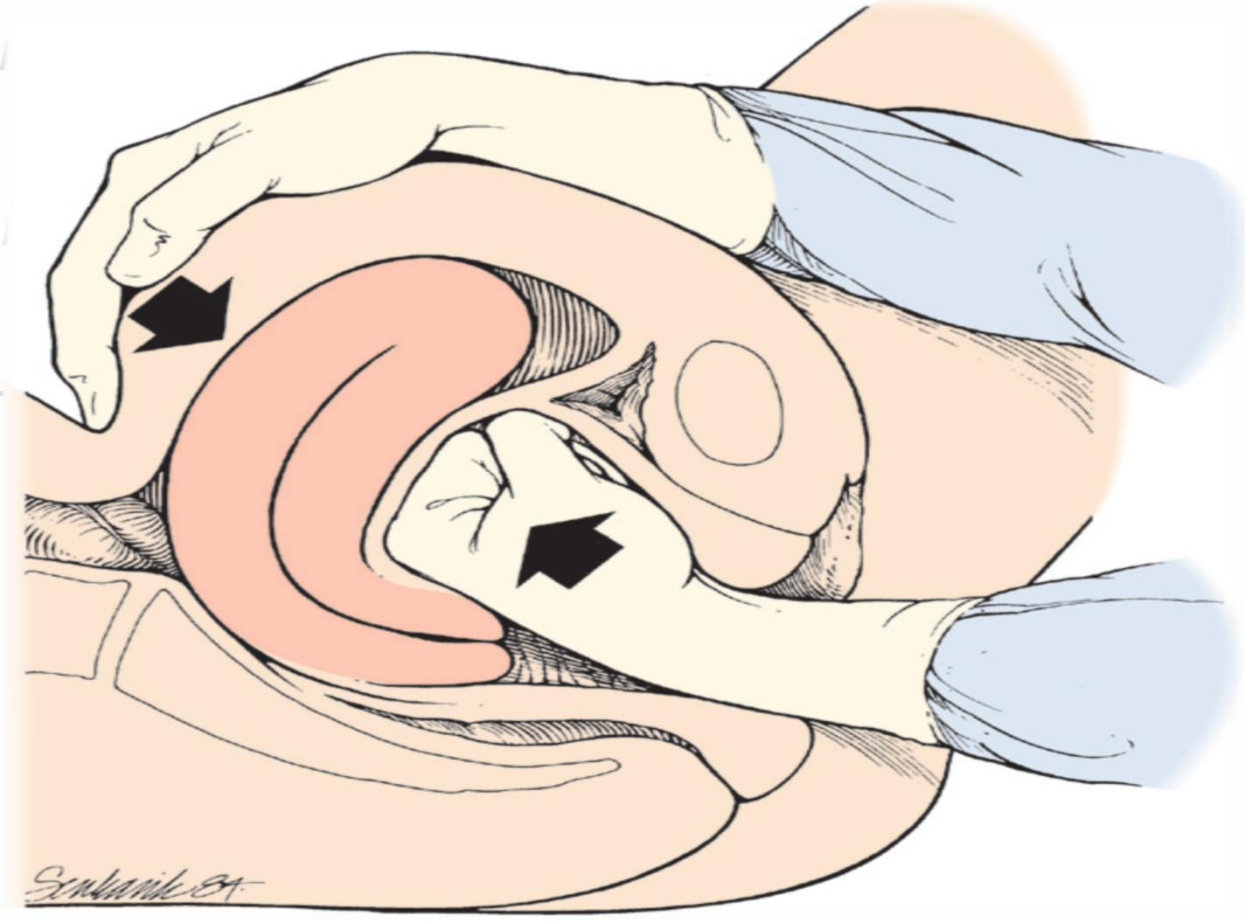
- *The choice of a second-line agent depends on its side-effect profile as well as its contraindications .*
- **Misoprostol** *is attractive as a second-line agent in that it has multiple administration routes that can be combined.*
- **Methylergonovine (Methergine)** *has limited usefulness in the acute postpartum hemorrhage because of its relatively long half-life and its potential for worsening hypertension in patients with preexisting disease.*
- **Prostaglandin F2α (Hemabate)** *can be used for control of atony.*
  - *It is important to note that asthma is a strong contraindication to its use because of its bronchoconstrictive properties.*

# *Cont'd.*

- *The important point is not the sequence of drugs, but the prompt initiation of uterotonic therapy and the prompt assessment of its effect.*
- *It should be possible to determine within 30 minutes whether pharmacological treatment will reverse uterine atony. If it does not, prompt invasive intervention is usually warranted*
- *If pharmacologic methods fail to control atony-related hemorrhage, alternative measures must be undertaken.*
  - *These include uterine tamponade, bimanual uterine compression, and surgical intervention.*

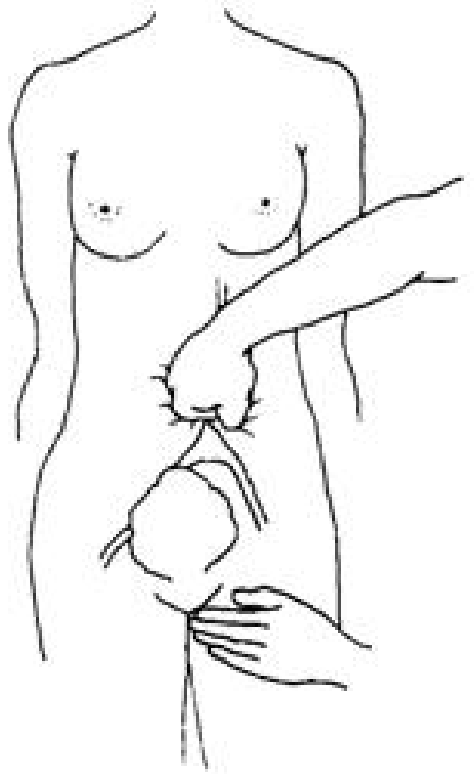
# Bimanual Uterine massage

- *Compress* the *uterus between the exter internal intravaginal hand.*
- *Once bimanual compression is required possible operative intervention.*
- *The compression may arrest bleeding or OR team,arrange blood & rx shock*.



# Abdominal Aorta Compression

- ***Compression of the abdominal Aorta may also b***
  ***bimanual compression.***

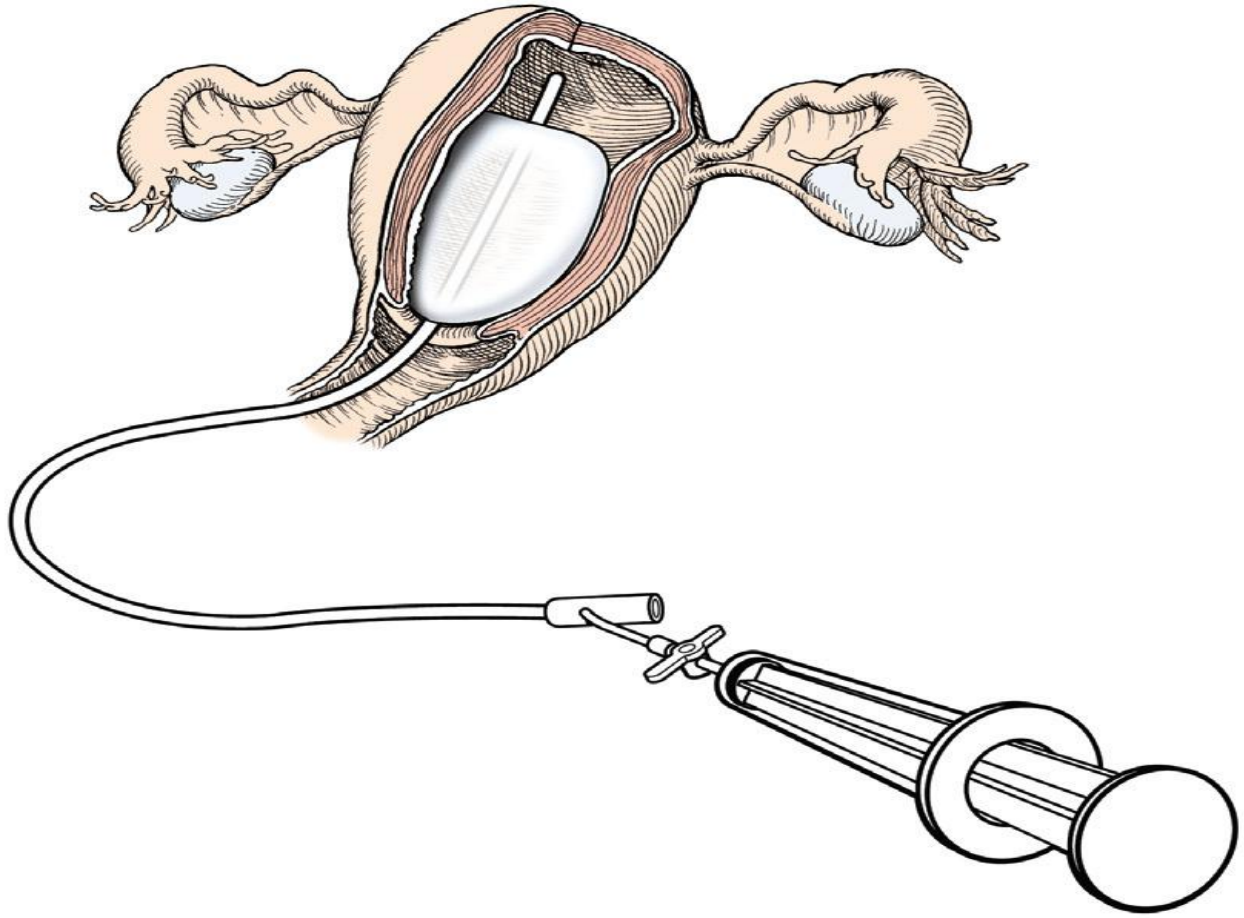


# *UTERINE TAMPONADE*

- **Uterine packing;** *provide tamponade to the bleeding uterine surface.*
- *Packing should not be for more than 12 to 24 hours, and close attention to the patient's vital signs and blood indices should be paid while the pack is in place in order to minimize unrecognized ongoing bleeding.*
- **Intrauterine tamponade balloons;** *have replaced traditional uterine packing*.

# *Cont'd.*

- *The Bakri SOS balloon  consists of a silic*
- *The catheter is inserted into the uterus guidance, and the silicone balloon is sub (maximum of 500 mL).*



# *SURGICAL INTERVENTION*

- *Surgical intervention by laparotomy is necessary when uterine atony is unresponsive to conservative management.*
- *Possible interventions include:*
  - ***Arterial ligation***
  - ***Uterine Compression sutures, and***
  - ***Hysterectomy***

# Artery Ligation

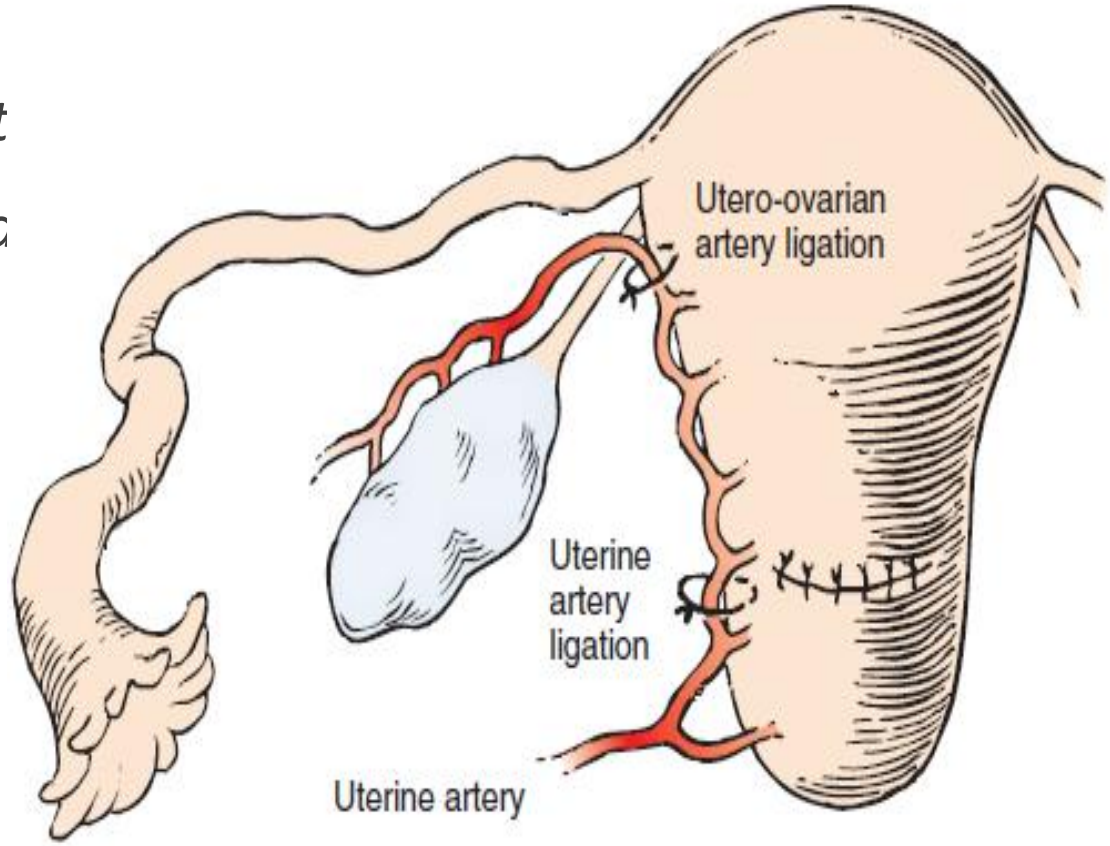
- *The goal of arterial ligation is to decrease uterine perfusion and subsequent bleeding.*
- *Arterial ligation may be performed on the ascending uterine arteries, the utero-ovarian arteries, the infundibulopelvic ligament vessels, and the hypogastric arteries.*

# Uterine Artery Ligation

- *During pregnancy, 90% of the blood flow to the uterus is supplied by the uterine arteries.*
- *Direct ligation of these easily accessible vessels can successfully control hemorrhage in 75–90% of cases, particularly when the bleeding is uterine in origin.*
- *Recanalization can occur, and subsequent pregnancies have been reported.*
- *It is the best initial ligation technique given its ease in performance and the accessibility of the uterine artery.*

# Technique

- *Absorbable suture on a large needle is*
  *artery and vein on 1 side of the uterus,*
  *cm medial to the vessels and through t*
- *The same procedure is then performed*

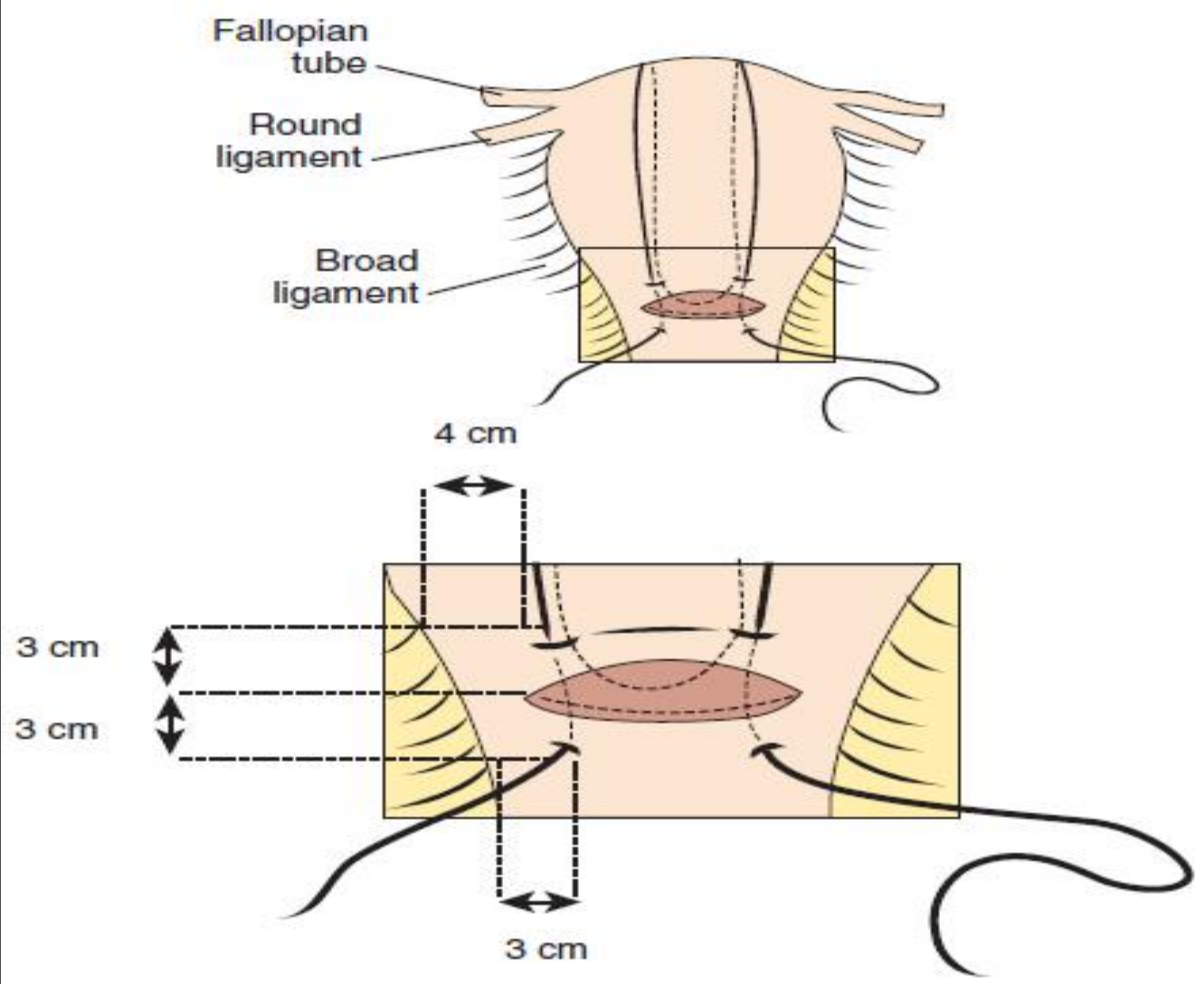


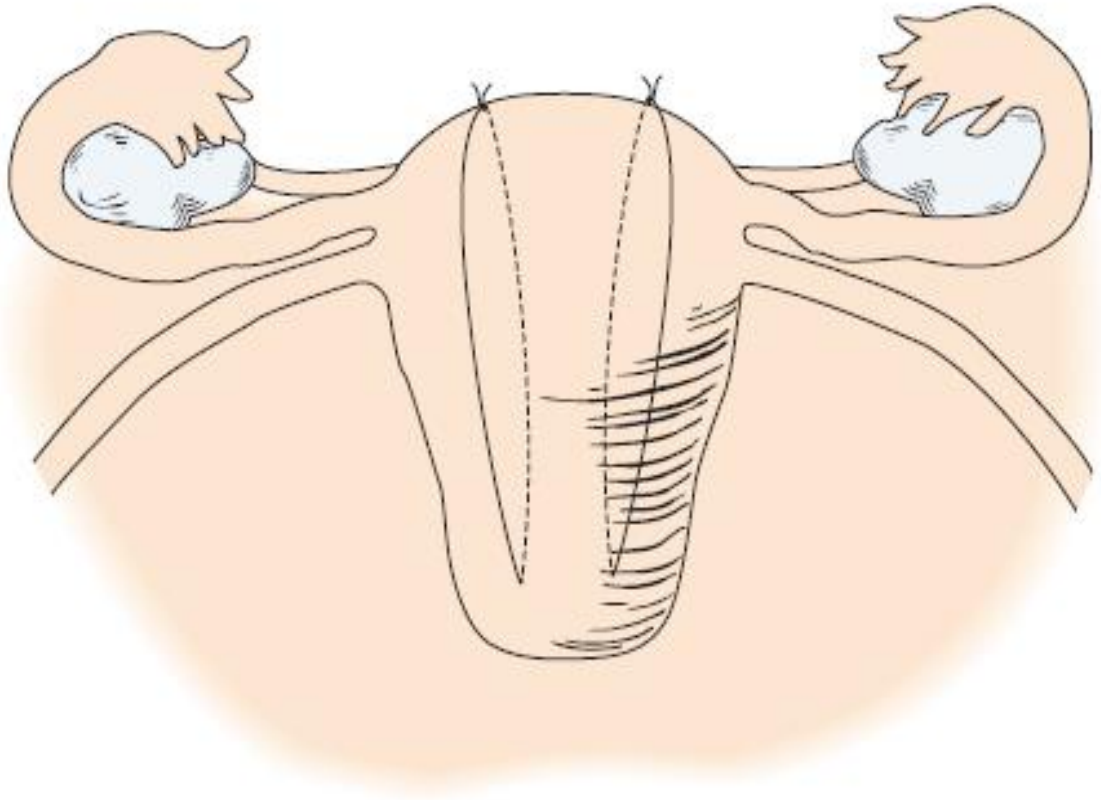
# Uterine compression

- *Large absorbable suture is typically anchored within the uterine myometrium both anteriorly and posteriorly.*
- *It is passed in a continuous or intermittent fashion around or through the external surface of the uterus and tied firmly so that adequate uterine compression occurs. There are several techniques ;*

❖ ***B-Lynch suture***

# B-Lynch suture & Hayman vertical sutures



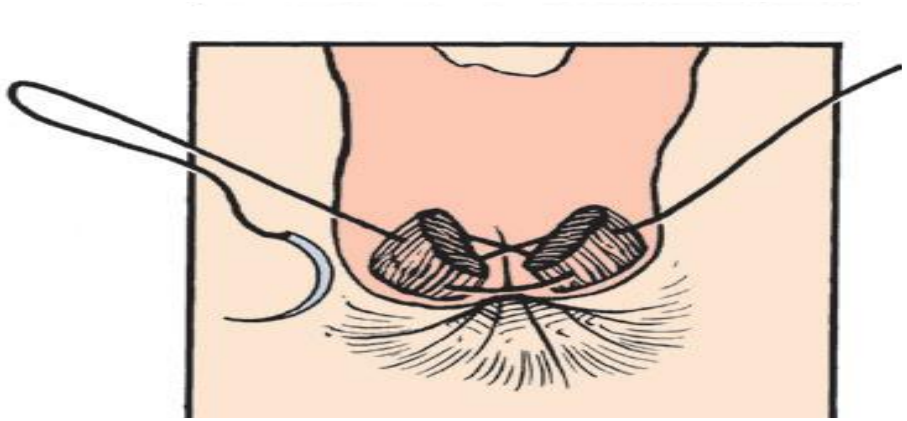



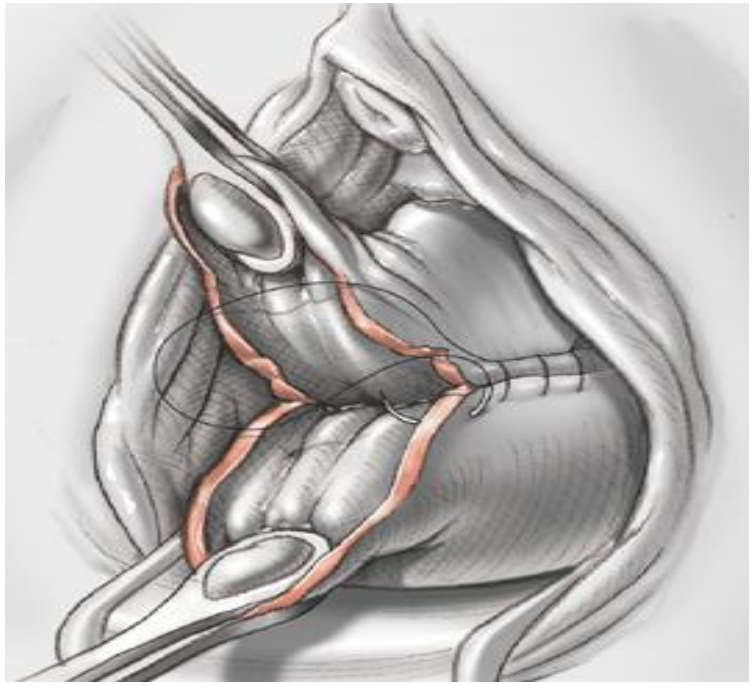
# Hysterectomy

- *It is the final surgical intervention for refractory bleeding due to atony*.
- *It provides definitive therapy*.

# Genital Tract Lacerations

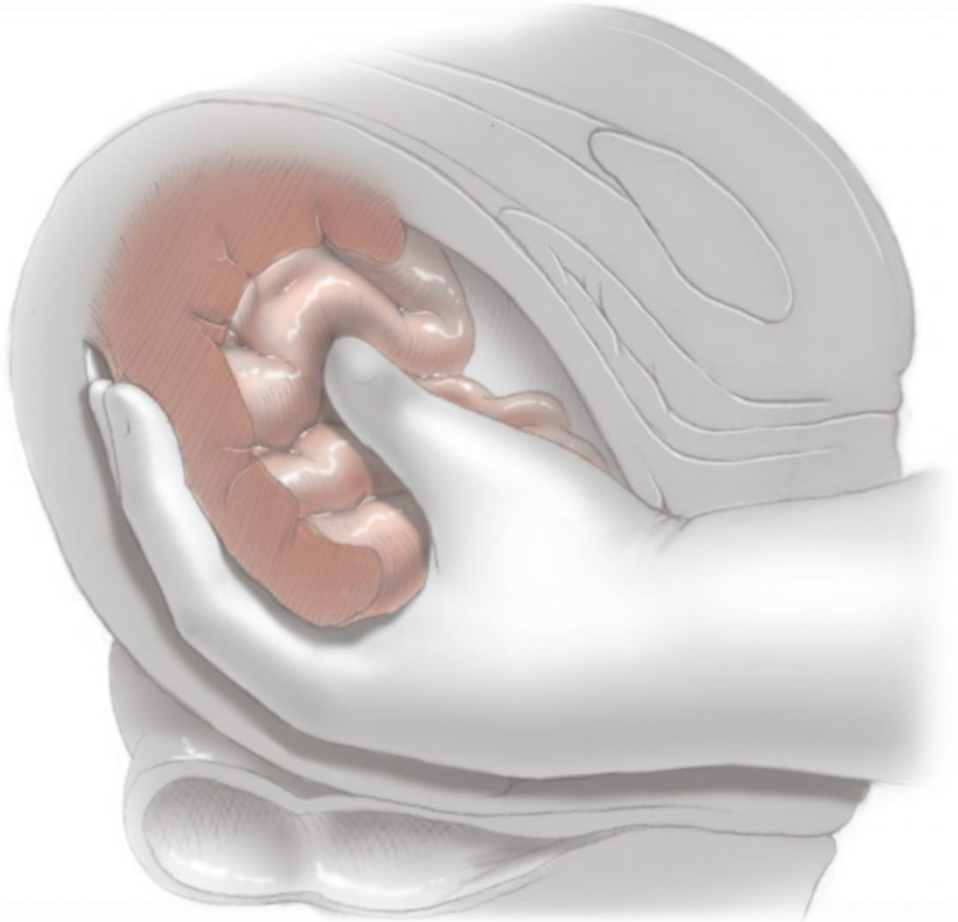
- *Mx: Repair heavily bleeding vaginal and cervical lacerations with a running locked #0 absorbable suture.*
  - *Episiotomy should be repaired.*





# Retained Products of Conception

- ***Mx:***
  - *Explore the uterus and any retained p*
    *should be removed manually  or by ut*



# Uterine Rupture

**❑Mx:**

➢*The site of rupture should be assessed to determine whether it can be repaired.*

➢*If feasible, the rupture can be repaired in multiple layers with absorbable suture.*

➢*Hysterectomy for cases of ;*

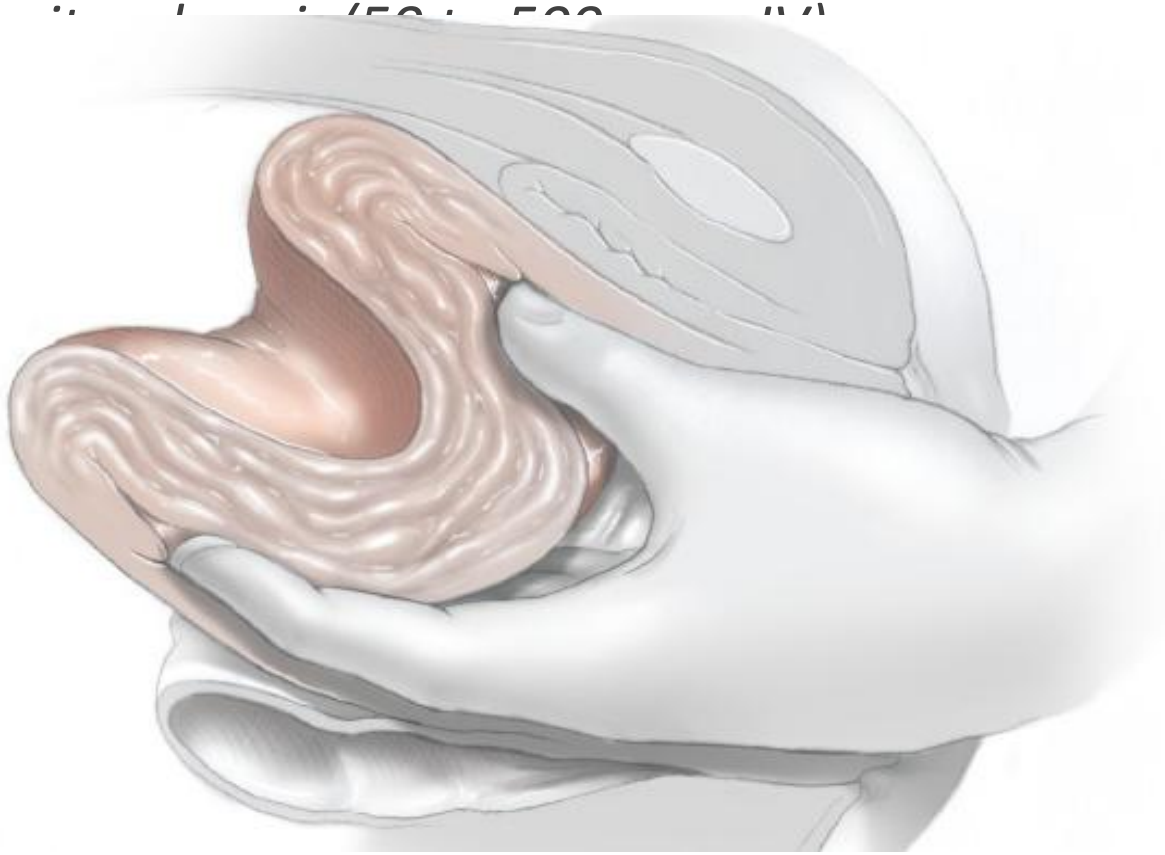
❖*Massive hemorrhage,*

❖*Irreparable uterine defects(*grossly infected uterus; gross intra abdominal infection; posterior uterine rupture; Ragged rupture impossible to repair; extensive tear difficult to repair)

❖*Maternal hemodynamic instability*.

# Uterine Inversion *Mx:*

- *Relax the uterus and cervix  initially be witl*
  *tocolytic agent (magnesium sulfate or terb*
  *halogenated anesthetic(eg, halothane).*
- *The inverted fundus, along with the placen*
  *steadily pushed upward in the axis of the u*



# *Cont'd.*

- *The palm is placed on the center of the inverted fundus, while fingers identify the cervical margins.*
- *Uterotonic therapy should then be given to assist with uterine contraction and prevent recurrence of the inversion.*
- *If manual repositioning is unsuccessful, other options include surgical correction.*

# *Cont'd.*

❑*Surgical options:*

❖*Huntington: involves a laparotomy with serial clamping and upward traction of the round ligaments to restore the uterus to its proper position.*

➢ *If this technique fails, the Haultain procedure is used.*

❖*Haultain : procedure which uses a vertical incision within the inversion and manual repositioning of the fundus.*

# Coagulopathy

MX:

- *The most important factor in the successful treatment of coagulopathy is identifying and correcting the underlying etiology.*
- *For most obstetrical causes, delivery of the fetus initiates resolution of the coagulopathy.*
- *In addition, rapid replacement of blood products and clotting factors should occur simultaneously.*
- *The patient should have two large bore intravenous catheters for fluid and blood component therapy.*
- *Finally, adjuvant therapies, such as vitamin K, recombinant activated factor VIIa, fibrinogen concentrate, and hemostatic agents, should be considered.*

# THANK YOU