Postpartum Hemorrhage (PPH) and abnormalities of the Third Stage

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دورة انقاذ الحياة المتقدم – وزارة الصحة

Postpartum Hemorrhage

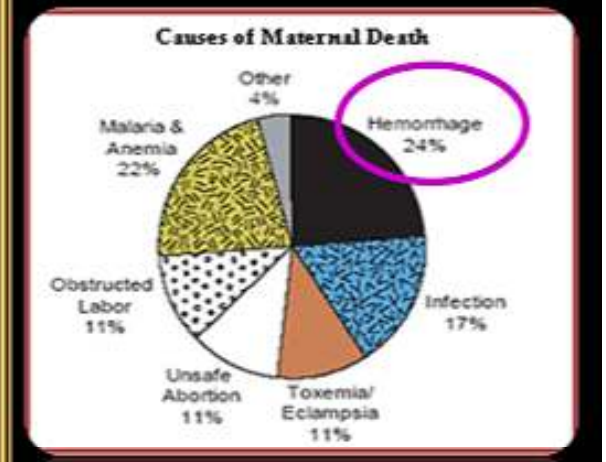
- **Definition**
  - **EBL** > 500 ml at vaginal delivery
    > 1000 ml at Cesarean section

Postpartum Hemorrhage

- Classification: May be:
  - ❖ Early PPH : **If within 24 hrs. pp = 1° pp hemorrhage** (Immediate , or primary)
    - Occurs in 4-6% of pregnancies
  - Or **Late PPH** :**If 24 hrs. - 6 wks. pp = 2° pp hemorrhage** (Secondary)

Why it is important?

- ***Hemorrhage*** is the underlying causative factor in at least **25% of maternal deaths** in industrialized and underdeveloped countries
- Other serious sequelae:
  - ARDS, coagulopathy, shock, loss of fertility
- Hemorrhage frequently occurs ***without any warning***



Incidence

- Incidence of obstetrical hemorrhage can not be determined precisely
- ACOG :
  - A post partum HCT drop of 10 volumes percent or
  - Need for transfusion.
- 3.9% *NVD*
- 6-8% C/S

We have 4 problems

- **Problem 1**: almost 50% of deliveries lose >500 ml of blood.
  - **5% of women delivering vaginally lose > 1000 ml.**
- **Problem 2:** estimated blood loss is often ***less*** than half the actual blood loss.
- ***Problem 3:*** Most of the serious causes of "PPH" have origins prior to the end of the 3rd Stage of labor.
- Problem 4: PPH, as defined, is technically misdiagnosed and clinically irrelevant.

- Vital signs may *remain near normal* until > 30% of blood volume is lost .
- Tachycardia can be attributed to pregnancy, stress, pain, and delivery.
- The effect of hemorrhage depend to a degree on the non pregnant blood volume, magnitude of PIH, degree of anemia at the time of delivery.

Measuring Blood Loss
A key step to EFFECTIVE TREATMENT…..

Underestimation leads to delayed intervention.

Visual estimated amounts of blood loss are far from accurate by as much as 30-50%: especially for very large amounts.

Old methods for estimating blood loss tend to be complex.

(include weighing soaked clothes and pads , collection into pans etc., Acid haematin techniques, Spectrophometric technics and measuring plasma volume changes)

Measuring Blood Loss in PPH
__THE BRASSS-V DRAPE

Etiology of PPH

Etiology – Primary Hemorrhage

Caused by The FOUR " T"s

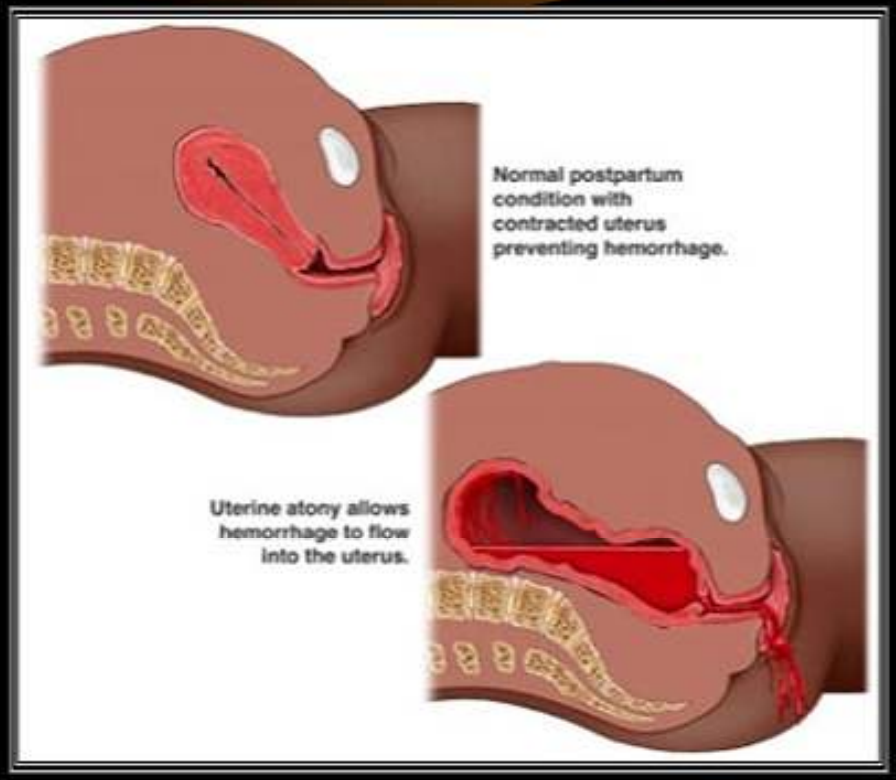
- **TONE**
- **TRUAMA**
- **TISSUE RETENSION**
- **THROMBIN**

BUT MOST IMPORTANT IS

Tone"Uterine Atony"90%of causes

Uterine atony

- Uterine over distension
  - ❖Polyhydramnios,
  - ❖Multiple gestations,
  - ❖Macrosomia
- Fatiqued uterus: precipitated labor , prolonged labor , Multiparity , drug eg . Oxytocin , augmented labor
- Intrauterine infection (Chorioamnionitis) → prolonged PROM
- tocolytic agents
- Halogenated anesthetic



Tissue retension "Abnormal placentaion"

Retained uterine contents

- Products of conception,
- blood clots

Tissue retension "Abnormal placentaion"

Placental abnormalities

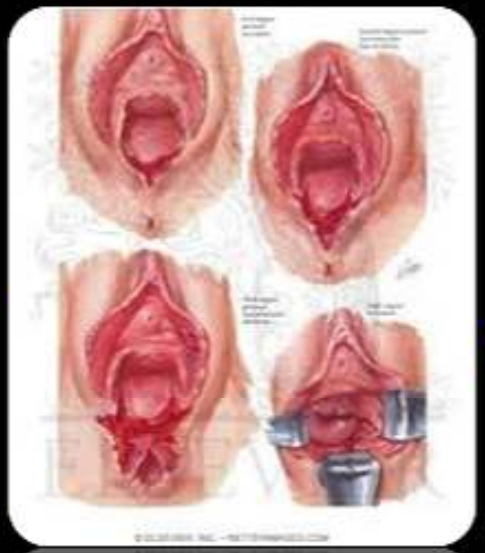
- **Congenital** → **Bicornuate uterus**
- **Location** → **Placenta previa**
- **Attachment** → **Accreta**
- **Acquired structural** → **Leiomyoma, previous surgery**
- **Peripartum** → **Uterine inversion, uterine rupture, placental abruption**

TRUMA "Obstetric OR OPERATIVE"
"7% of causes"

Lacerations and trauma

Planned

- **Operative Trauma**
  - Cesarean sections
  - Episiotomies
  - Forceps, Vacuums, Rotations



Unplanned

Obstetric Trauma

- Uterine Rupture
- Lacerations of the Birth Canal

Thrombin "Coagulation Defects 2-3% of causes

Coagulation disorders

Congenital

- **Von Willebrand's disease**
- **Inherited Clotting Disorders**

Acquired

- ✓ Sepsis
- ✓ Amniotic Fluid Embolism
- ✓ Abruptio Placentae associated coagulopathy
- ✓ DIC,
- ✓ dilutional coagulopathy,
- ✓ Anticoagulant Therapy (Heparin)
- ✓ HELLP Syndrome

prevention

Women in whom these factors have been identified should be advised to deliver in a specialist obstetric unit

Risk Factor	odds ratio for PPH
•Proven abruptio placentae	13
•Known placenta praevia	12
•Multiple pregnancy	5
•Pre-eclampsia/gestational hypertension	4

The following factors, becoming apparent during labour and delivery are associated with an increased risk of PPH.

Risk factor	odds ratio for PPH
•Delivery by emergency Caesarean section	9
•Delivery by elective Caesarean section	4
•Retained placenta	5
•Mediolateral episiotomy	5
•Operative vaginal delivery	2
•Prolonged labour (>12 hours)	2
•Big baby (>4 kg)	2

In the event of a woman coming to delivery while receiving therapeutic heparin,

the infusion should be stopped. Heparin activity will fall to safe levels within an hour. Protamine sulphate will reverse activity more rapidly, if required.

Antenatal assessment

anemia

Detection of ***anemia*** is important, because anemia at delivery increases the likelihood of a woman requiring blood transfusion.

Prevention of Postpartum Hemorrhage

The second stage of labor should be short.

The correct management of the third stage is using *oxytocin* or *ergometrine*

- Oxytocin
  - With or soon after delivery
- Cord traction
  - Continues tension
  - Gentle pull with contraction
- Uterine massage after placental delivery

What to Do Next?!

What to Do Next?!

Postpartum hemorrhage is a **sign**, not a diagnosis – find out what is causing bleeding

Calmly work your way through the list of possible causes

- If you get to the end of the list and don't have an answer then start again at the top of the list

Call for help if needed

- Extra nurses, anesthesia, Ob/Gyn

management

Guideline by the RCOG

- ✓ COMMUNICATE.
- ✓ RESUSCITATE.
- ✓ MONITOR / INVESTIGATE.
- ✓ STOP THE BLEEDING.

COMMUNICATE

call 6

- Call experienced midwife
- Call obstetric registrar & alert consultant
- Call anaesthetic registrar , alert consultant
- Alert haematologist
- Alert Blood Transfusion Service
- Call porters for delivery of specimens / blood

RESUSCITATE

- IV access with 14 G cannula X 2
- Head down tilt
- Oxygen by mask, 8 litres / min
- Transfuse
  - •Crystalloid
  - •Colloid
  - •once 3.5 litres infused, GIVE:

- 'O NEG' If no cross-matched blood available OR
- •give uncross-matched own-group blood, as available

•Give up to 1 liter Fresh Frozen Plasma and 10 units cryoprecipitate if clinically indicated

MONITOR / INVESTIGATE

- Cross-match 6 units
- Full blood count

- Clotting screen
- Continuous pulse / BP /

- ECG / Oximeter
- Foley catheter: urine output
- CVP monitoring

STOP THE BLEEDING

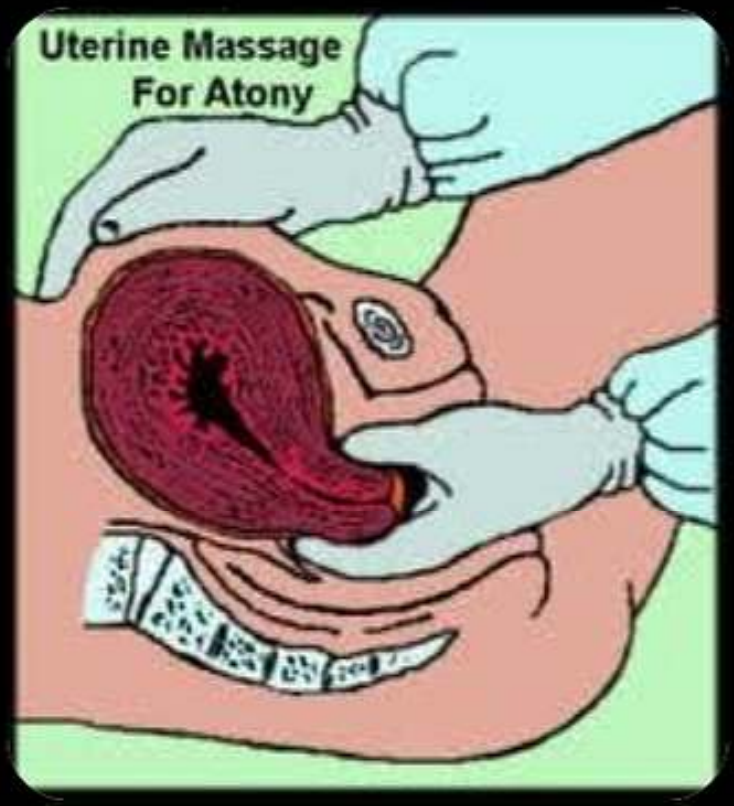
- Exclude causes of bleeding other than uterine atony
- Ensure bladder empty
- Uterine compression
- IV syntocinon 10 units
- IV ergometrine 500 μg
- Syntocinon infusion (30 units in 500 ml)
- prostaglandins
- Surgery earlier rather than late
- Hysterctomy early rather than late

If conservative measures fail to control haemorrhage, initiate surgical haemostasis SOONER RATHER THAN LATER

I. laparotomy
II. Bilateral ligation of uterine arteries
III. Bilateral ligation of internal iliac (hypogastric arteries)
IV. Hysterectomy

MANAGEMENT of Uterine atony

- ✓ Explore uterus for retained placental tissue.
- ✓ Uterine massage



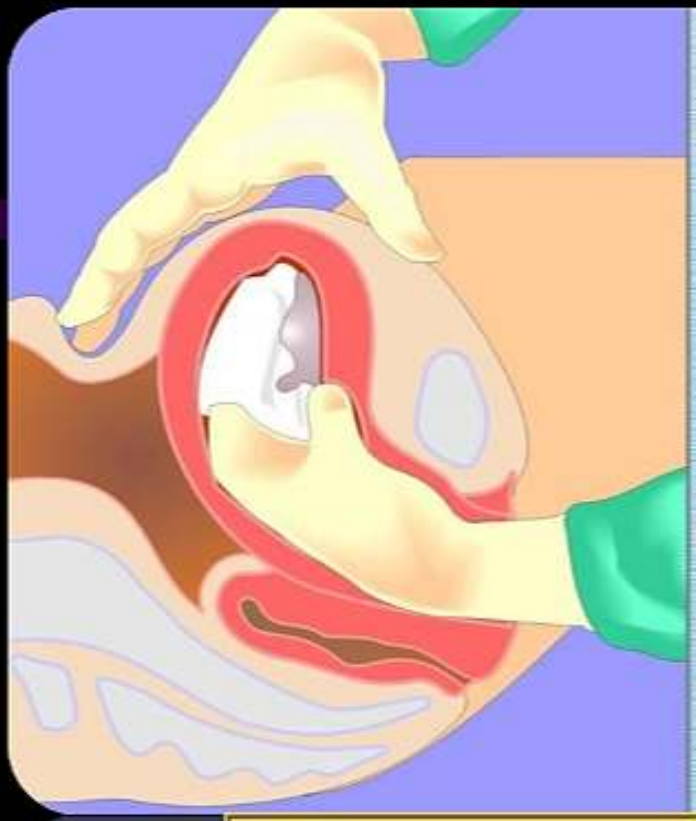
- ✓ Firm bimanual compression

management of uterine atony Cont'

"uterotonic agents"

- Oxytocin infusion, 40 units in 1 liter of D_5RL (Pitocin 10-40 units IV, continuous)
- Methergine (methylergonovine) 0.2mg IM
  - Repeat q2-4h, avoid in hypertension
- 15-methyl $PGF_{2\alpha}$ (Hemabate) , 0.25 - 0.50 mg IM ;
  - Repeat q15min, avoid in asthma
  - Higher risk of side-effects: diarrhea, fever, tachycardia
- PGE_1 200 mg, or PGE_2 20 mg are second line drugs in appropriate patients
- Cytotec (misoprostol, PGE_1) 800-1000mcg PR

Vaginal exploration



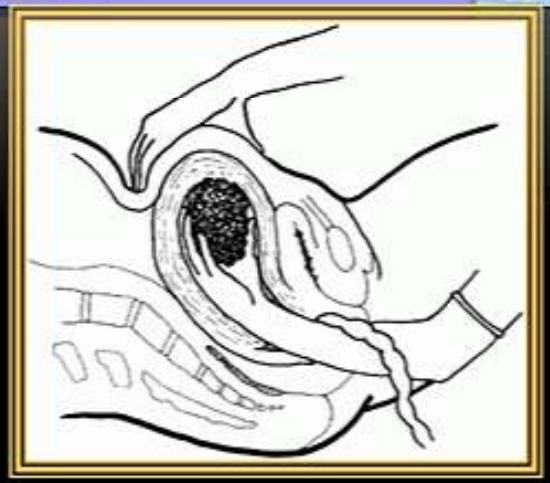
Manual Extraction

Digital exploration of the uterus

Removal of retained membranes and placental fragments

General anesthesia usually best

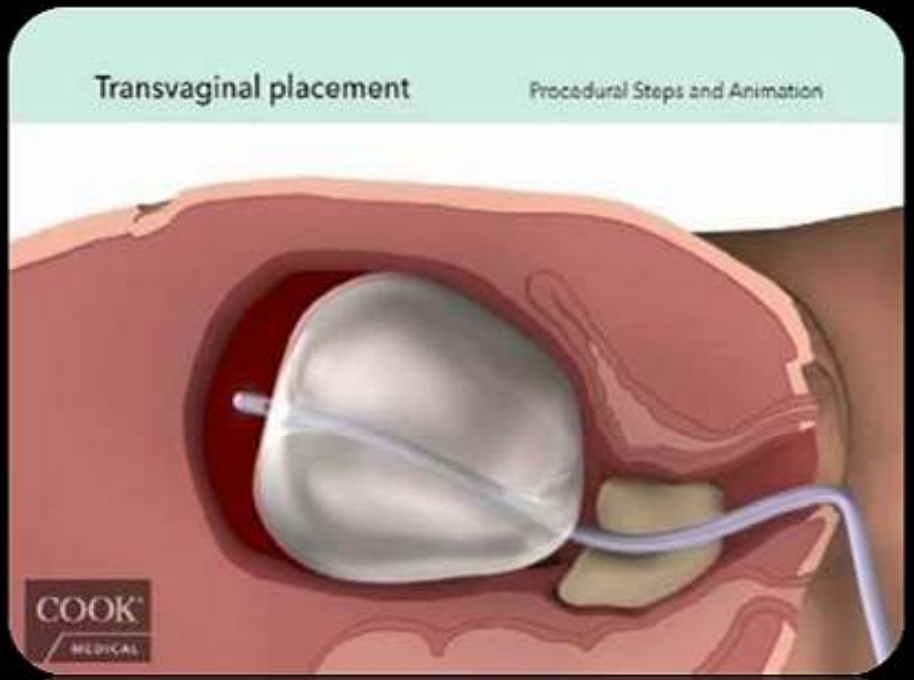
Uterine cavity manual exploration for retained placenta / uterine rupture

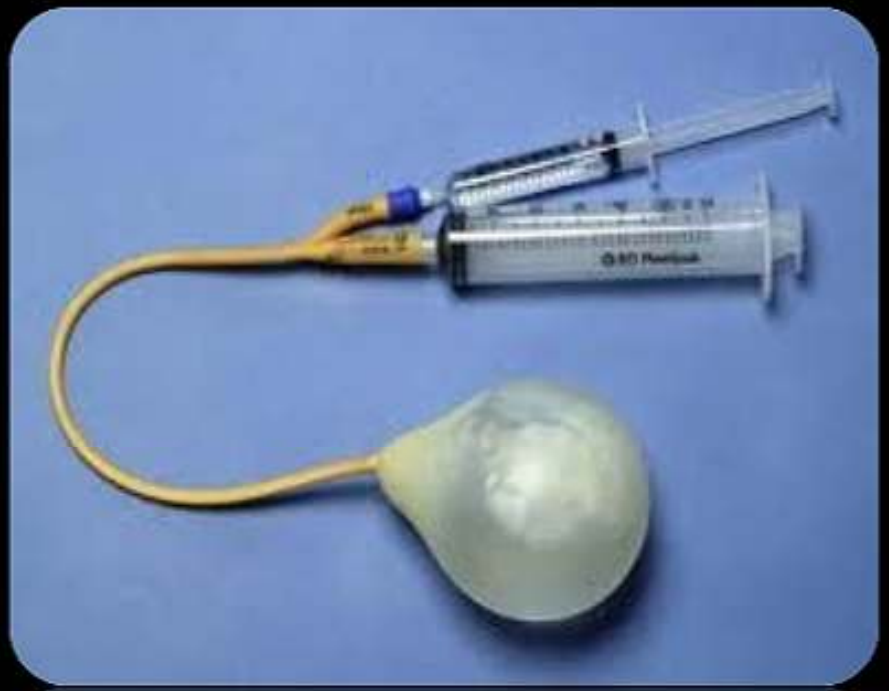


Vaginal exploration cont' Intrauterine balloon Cather

Uterine tamponade

- **Intrauterine foley catheter**
  - **One or more bulbs, 60-80ml of saline**



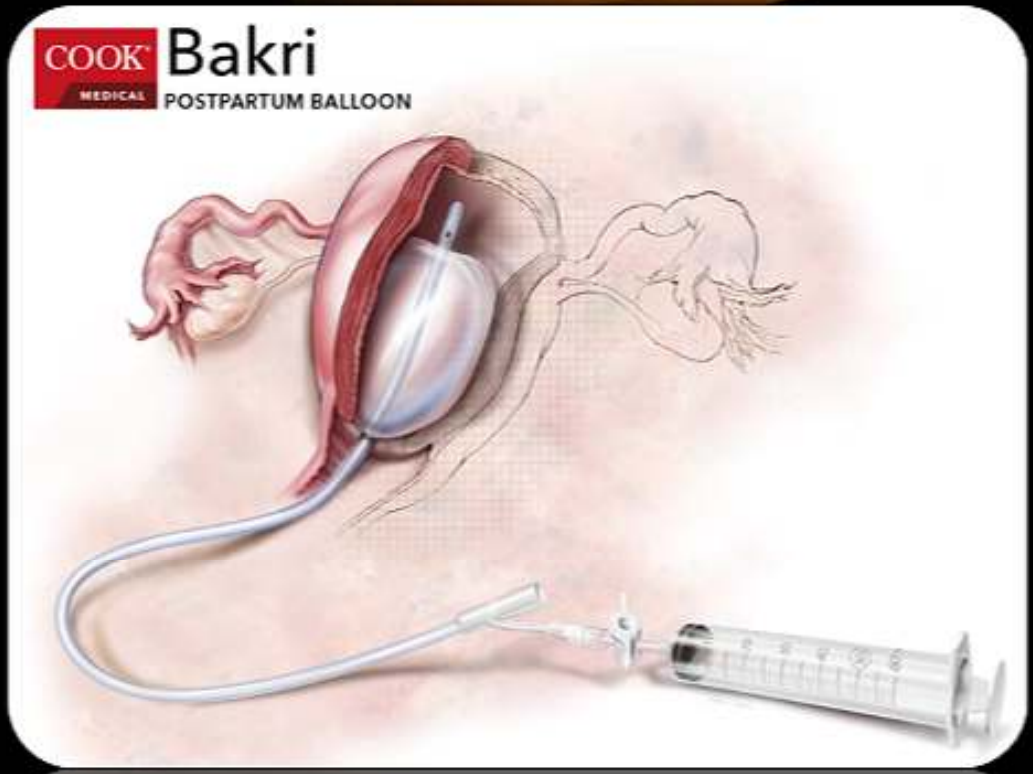


Bakri Balloon is a tamponade technique that can be used for PPH.

Uterine tamponade

Bakri tamponade balloon

- 300-500ml of saline



Surgical Management

Consider surgical management when uterotonic agents (± tamponade) don't work

Uterine curettage

Exploratory laparotomy

- Hypogastric artery ligation
- Bilateral uterine artery ligation (O'Leary sutures)
- B-Lynch technique
- Hysterectomy

When medical managament fails

SURGICAL MANAGEMENT

- Uterus conserving : NEED OF TIME
- Definitive - Hysterectomy

MANAGEMENT"cont'"

If hemorrhage is not controlled by medications, massage, manual uterine exploration, or suturing lacerations in the birth canal,

Then surgical or radiological options must be considered. At this time, start:

Packed red blood cell transfusion	**Foley catheter and monitor urine output**

Selective Arterial Embolization

If the patient is stable

and bleeding is not "torrential",

and if interventional radiology is available,

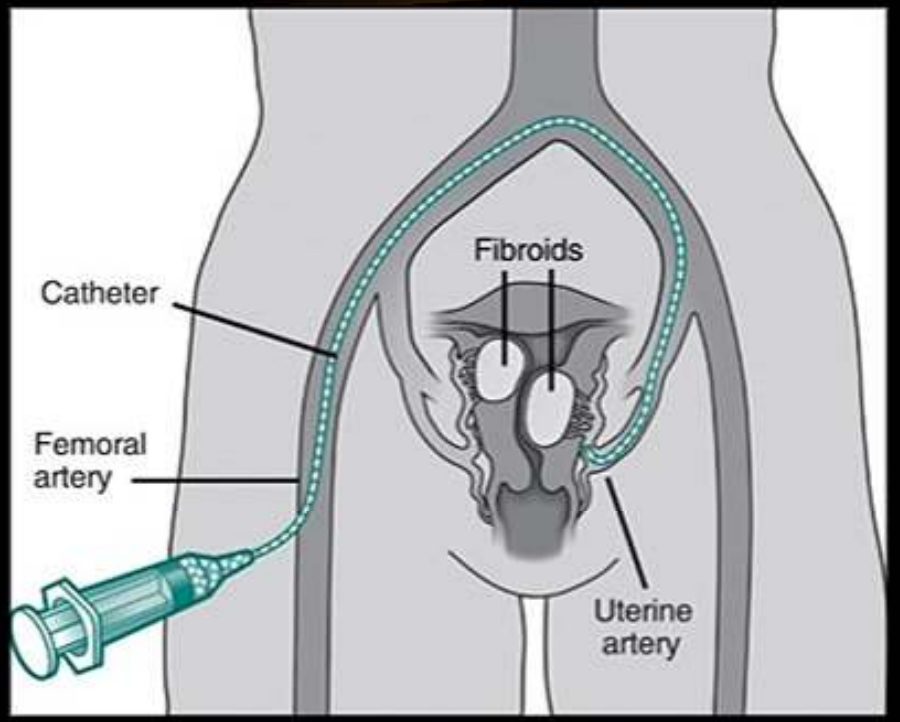
then pelvic arteriography may show the site of blood loss and therapeutic arterial embolization may suffice to stop the bleeding.

Uterine artery embolization

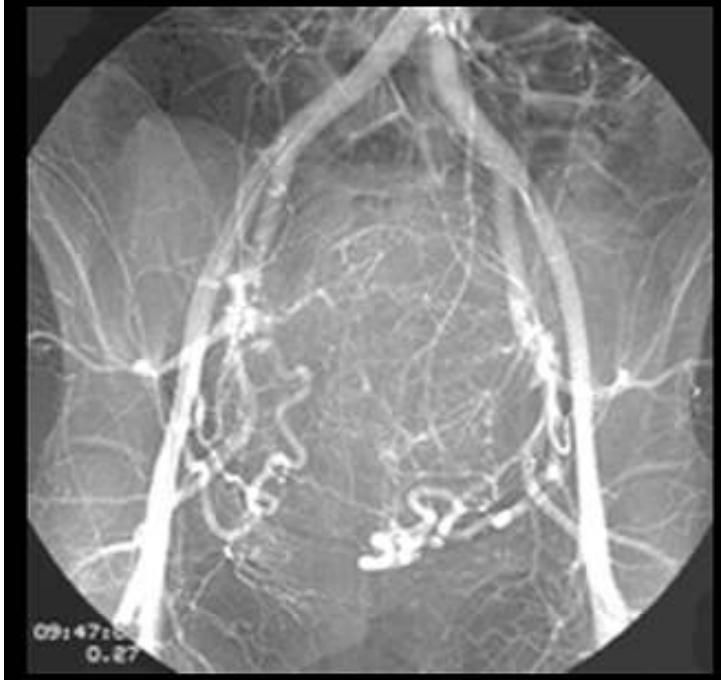
Real time X-Ray (Fluoroscopy)

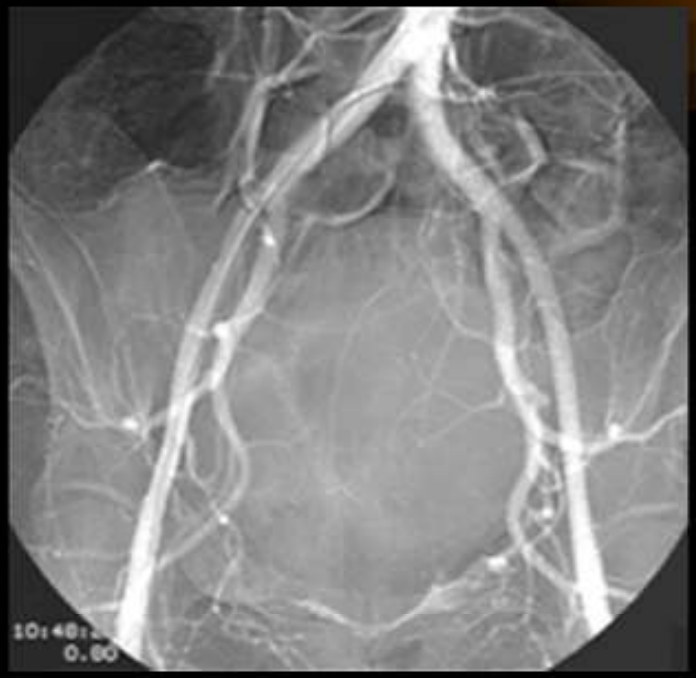
Gelatin Sponges are injected into the bleeding vessel until stasis of flow in target vessel is achieved.

Acess via RT femorals to internal iliac and subsequently the uterine arteries

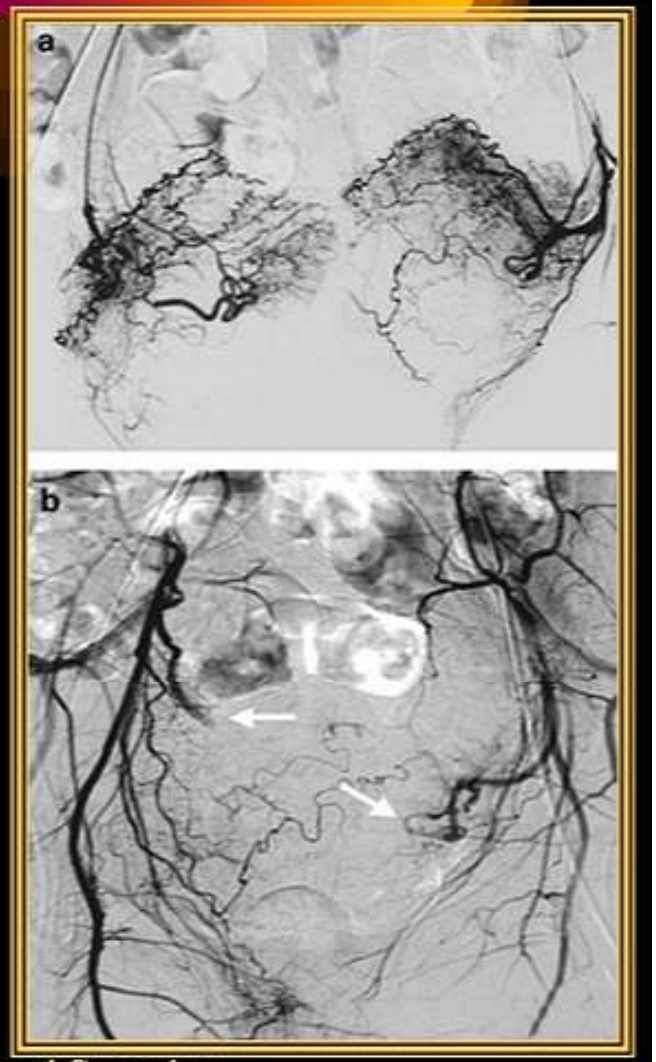


- Selective arterial embolization





Pre Embolization **Post Embolization**



Laparotomy for Obstetric Hemorrhage

- Bleeding at Cesarean section
- "Torrential" Hemorrhage
- Pelvic hematoma (expanding)
- Bleeding uncontroled by other means

AT laparotomy

- Consider vertical abdominal incision
- General anesthesia usually best
- Get Help!
- Direct manual uterine compression / uterotonics
- Direct aortic compression
- Modified B-Lynch Suture for atony: #2 chromic
- Ligation of uterine and utero-ovarian vessels: #2 chromic

Surgical Management

- Uterine compression suture (B-Lynch)

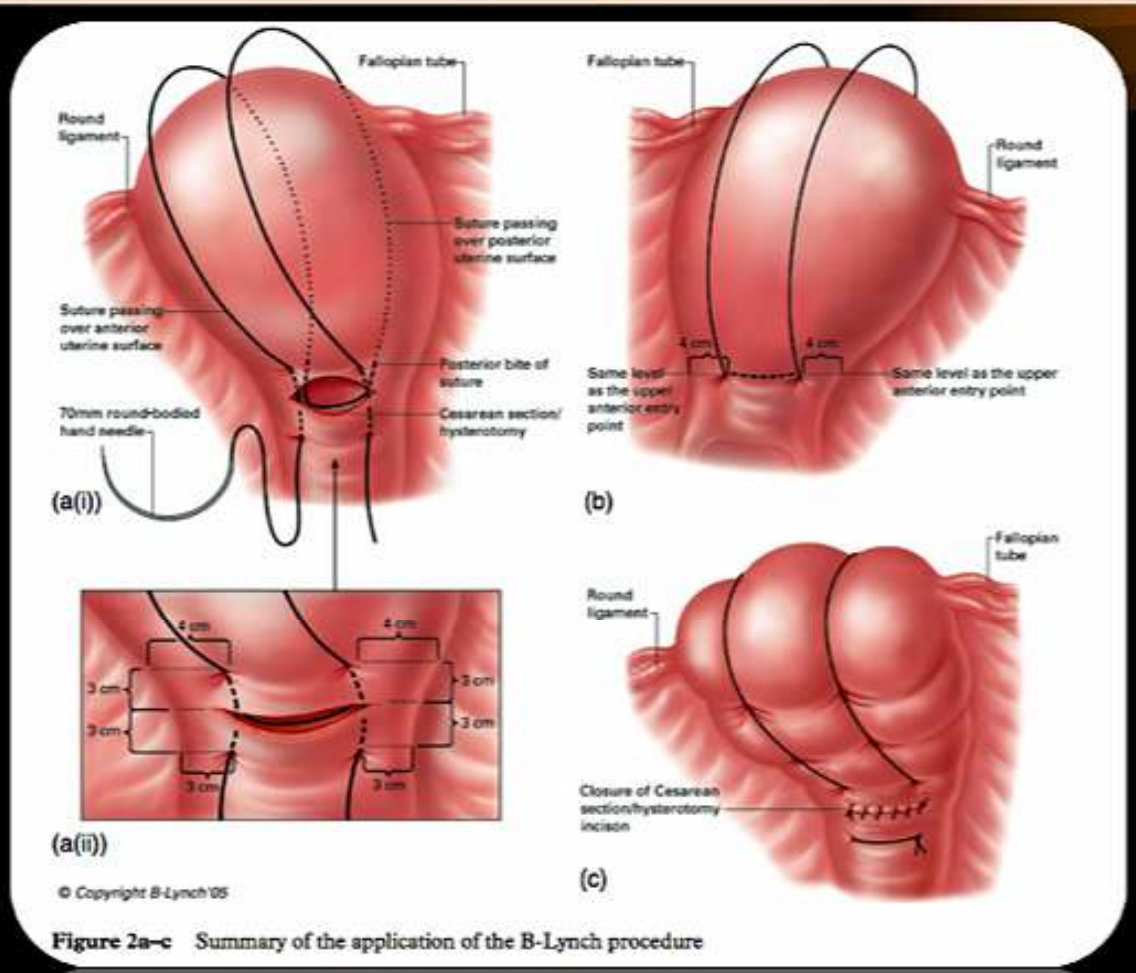
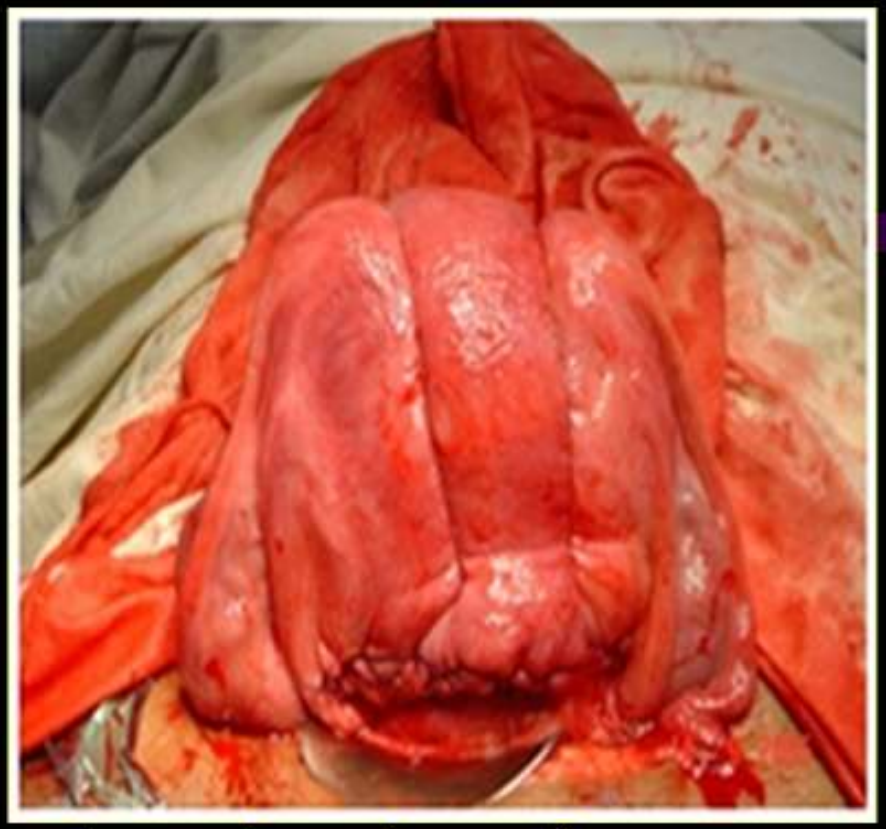
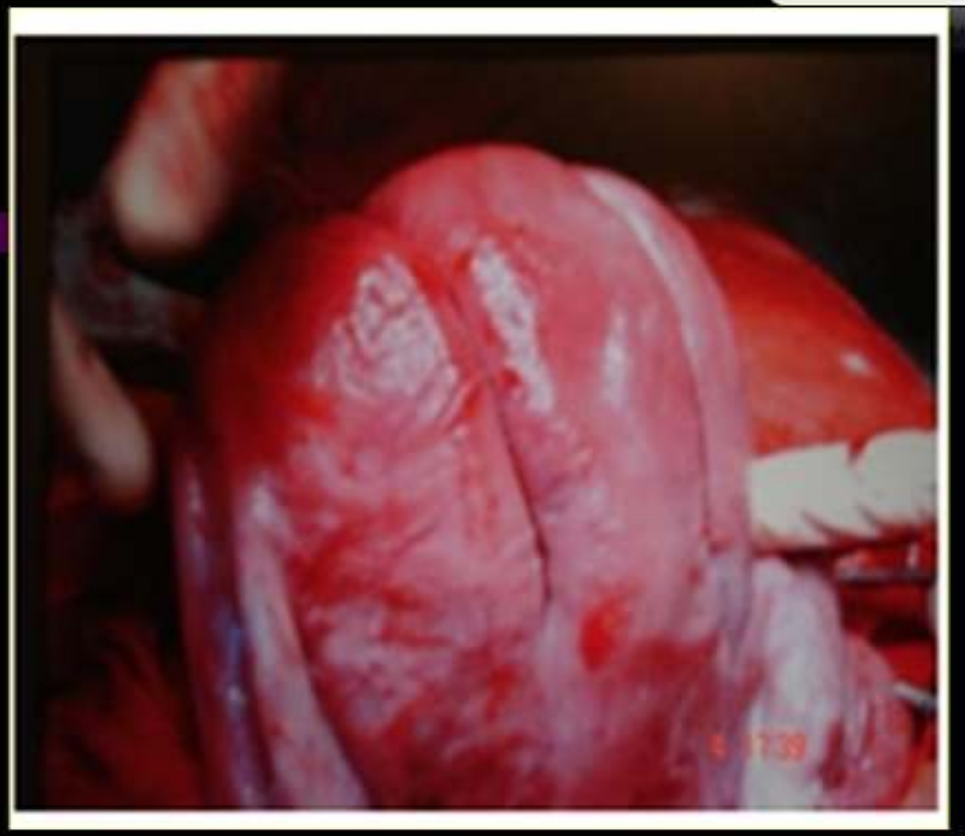


Figure 2a–c Summary of the application of the B-Lynch procedure

Dr.Hisham Al-Hammami Professor of Obstetrics and Gynecology
faculty of medicine Syrian private university



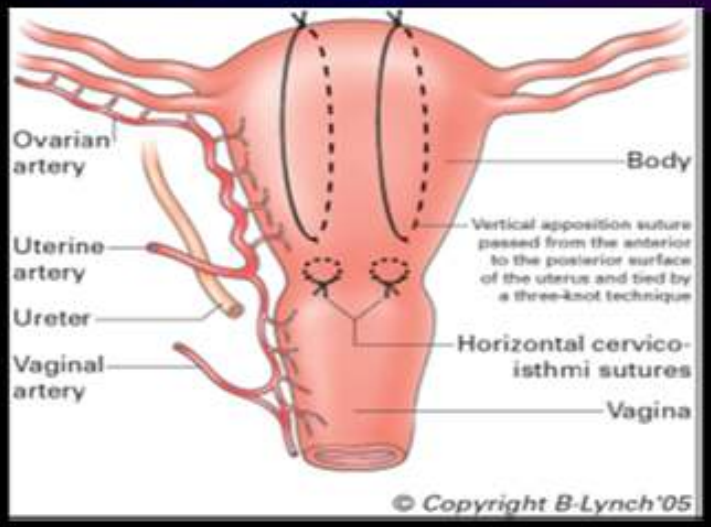
Anterior view of uterus showing modified B-Lynch Technique



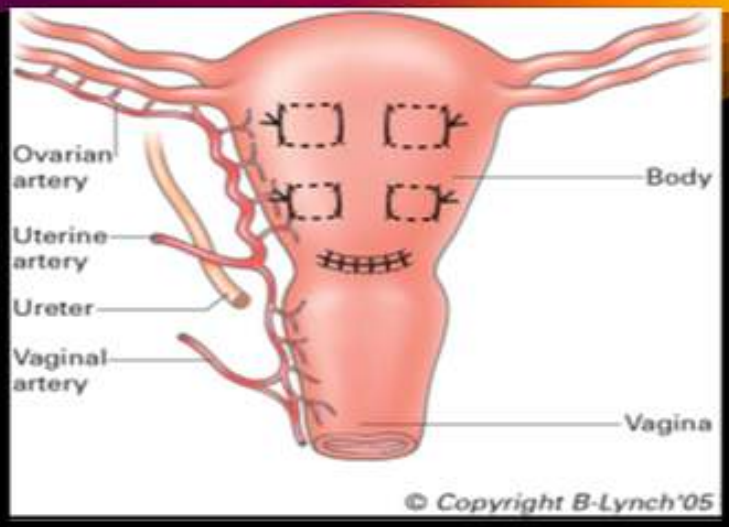
posterior view of uterus showing modified B-Lynch Technique

OTHER COMPRESSION SUTURES

- Hayman Uterine Compression Suture



Cho's Multiple Square Suture



Global Stitch By
Dr. Gunasheela Bangalore

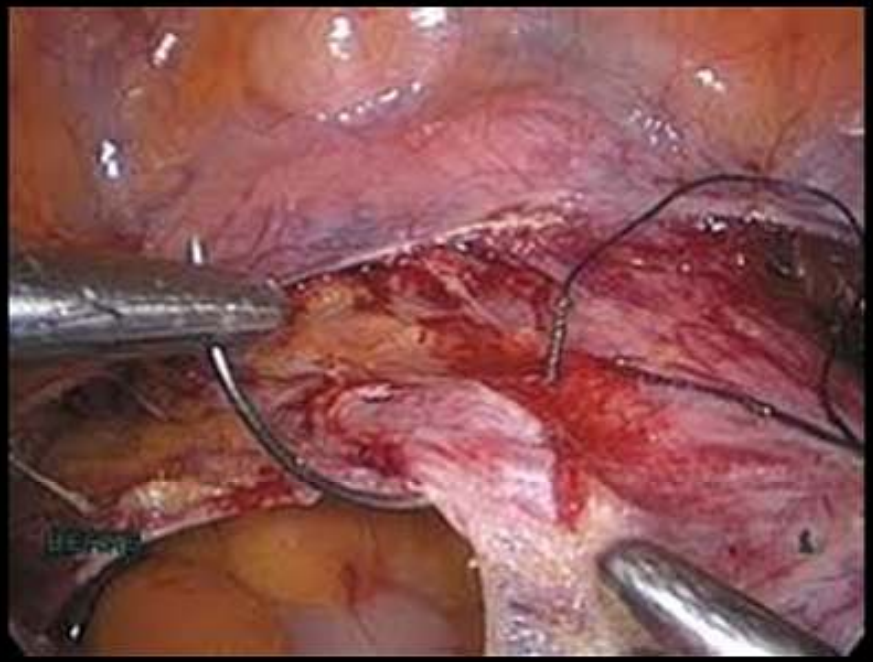
COMPLICATIONS

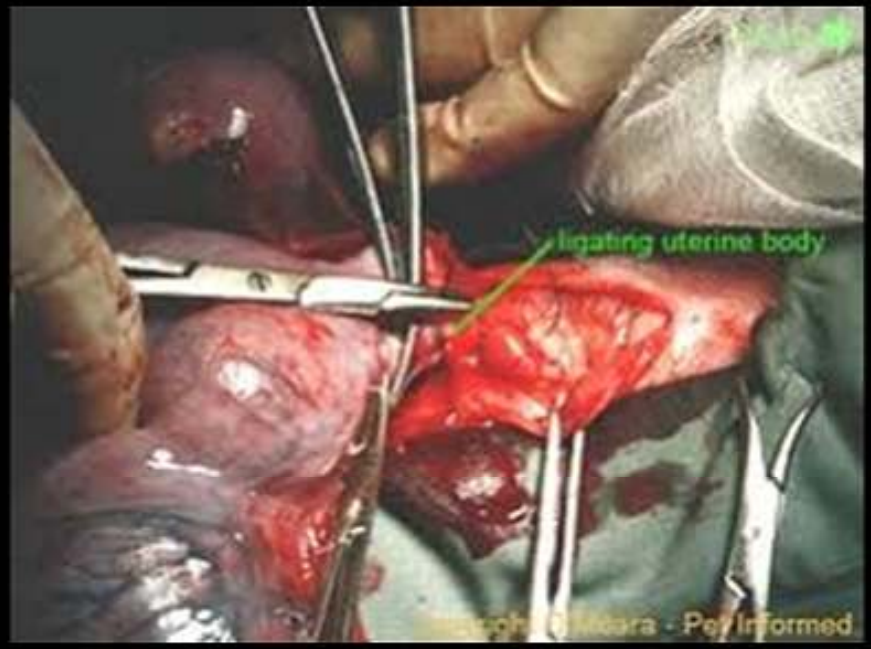
NIL - IF DONE PROPERLY

TOO TIGHT COMPRESSION --

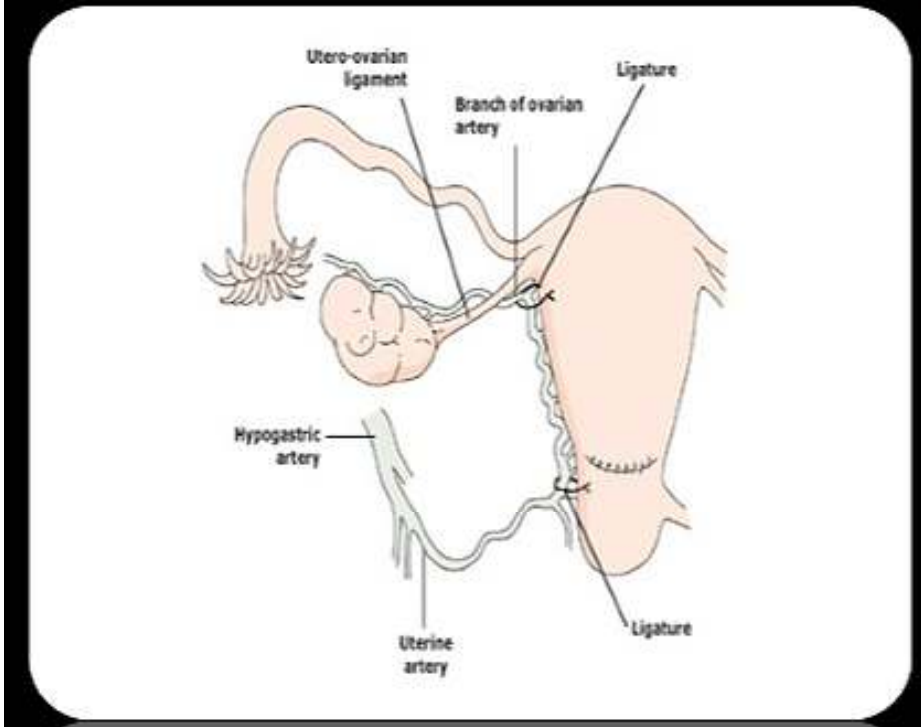
- **CUT THROUGH STITCH**
- **UTERINE NECROSIS**
- **INTRAPERITONEAL BLEEDING**

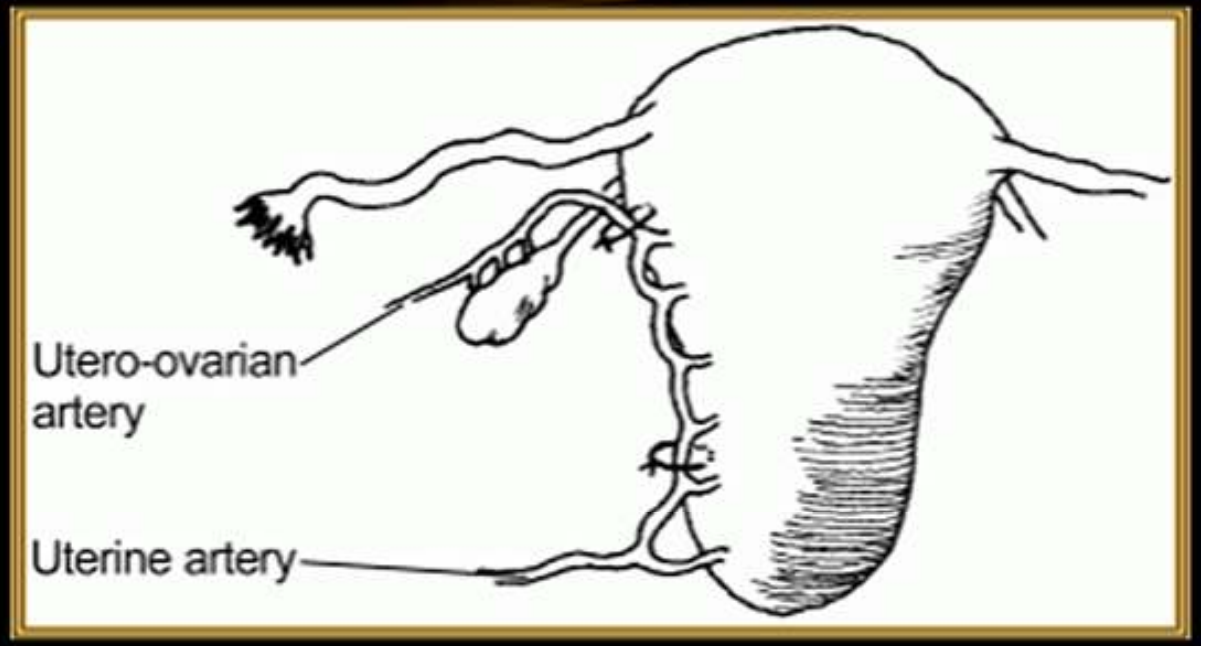
Uterine artery ligation





Sutures are placed to ligate the ascending uterine artery and the anastomotic branch of the ovarian artery.

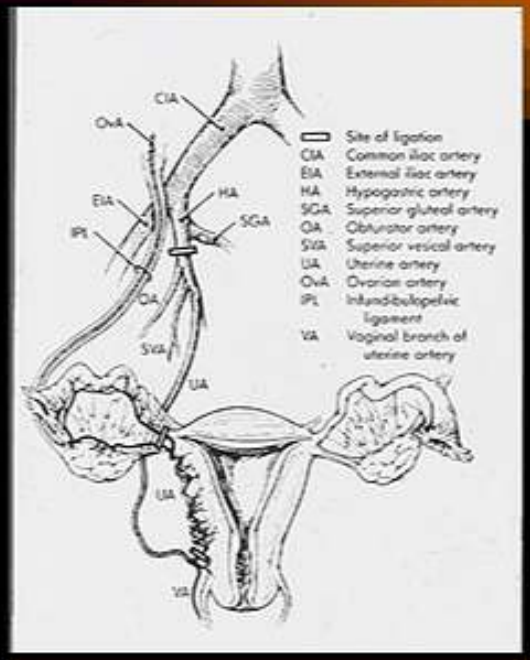


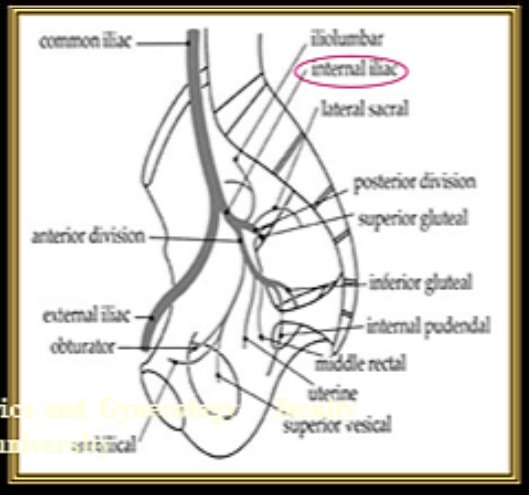


Internal iliac (hypogastric) artery ligation

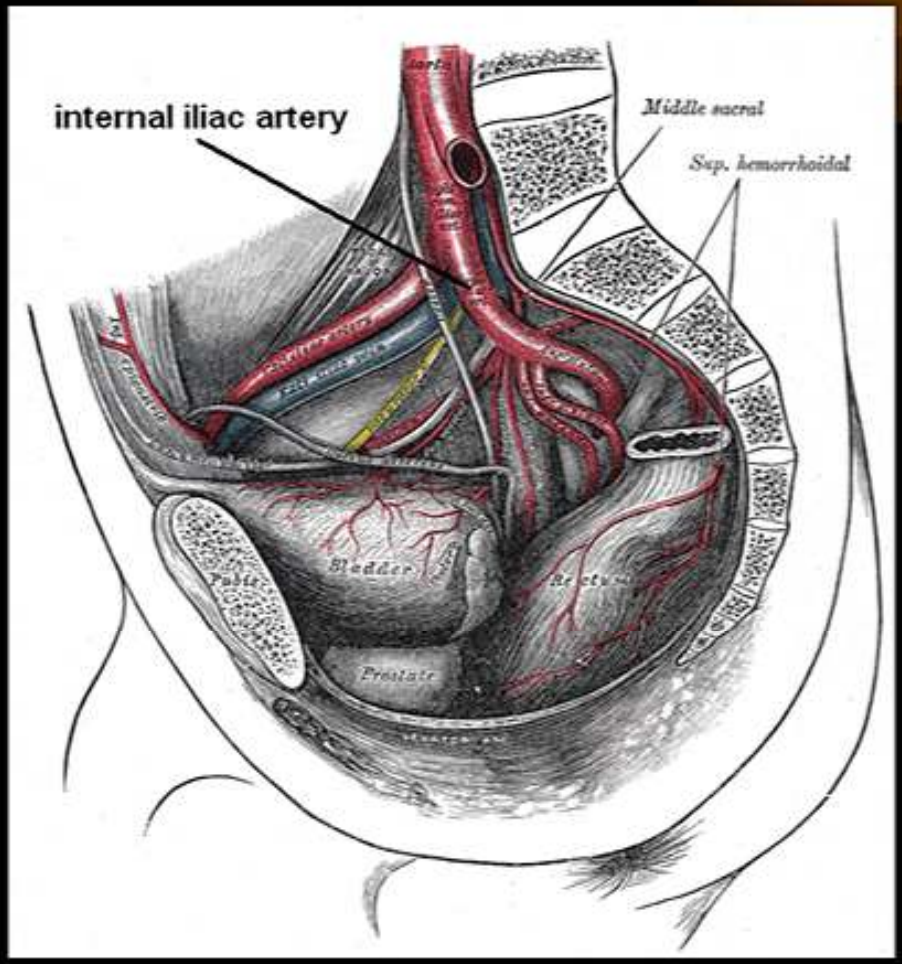
- 50% success rate
- Desirous of children
- Experience of surgeon

- **Steps:**
  - Ligate at least 2-3 cm from bifurcation
  - #1 silk. Do not divide vessel



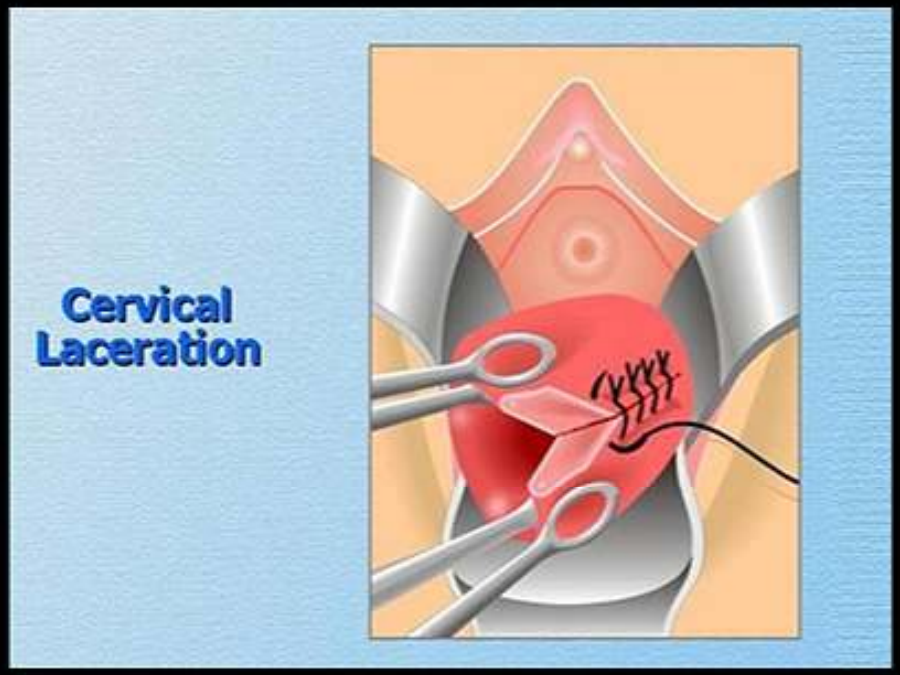


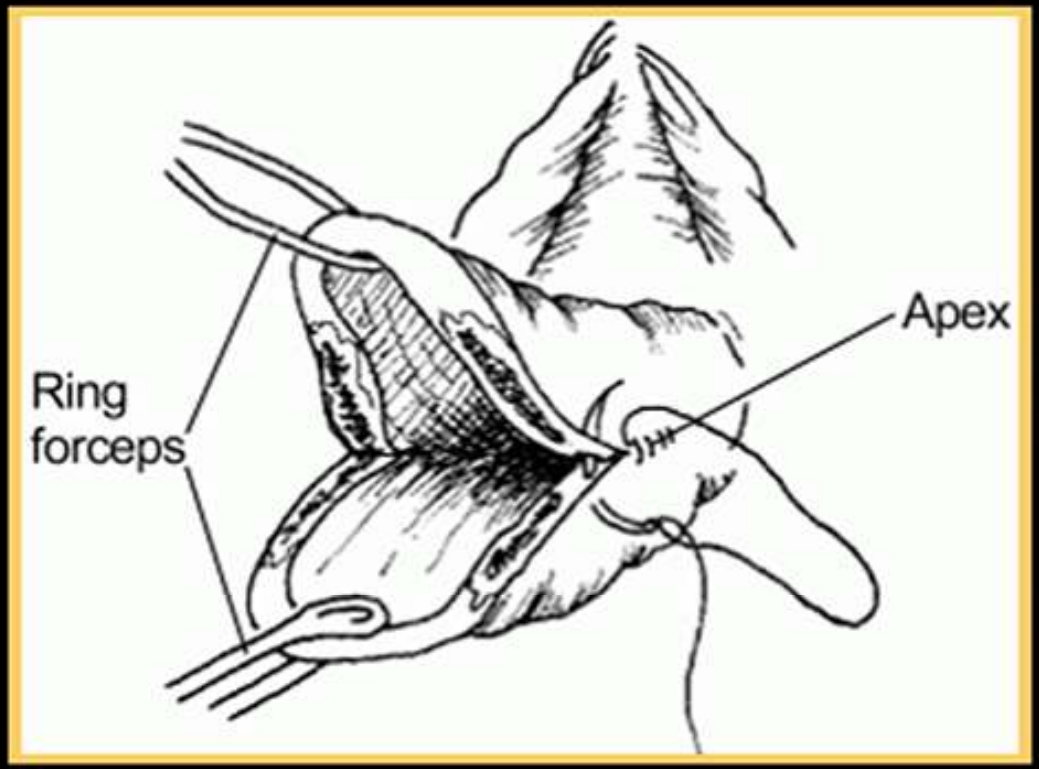
Internal iliac (hypogastric) artery ligation

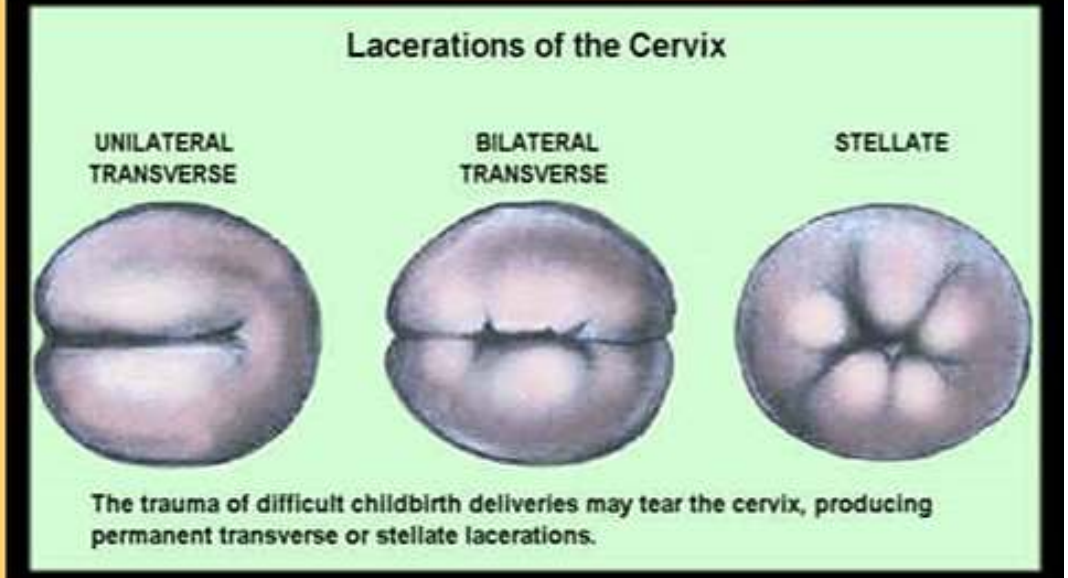


Repaire of cervical laceration

- Palpate uterine cavity to assure its integrity
- Full thickness mucosal repair above the apex
- Contionous interlocking absorbable sutures
- Hematoma incised, clot removed , bleeding vessels ligated , oblitrate defect with interlocking sutures
- Antibiotics& vaginal pack for 24 hours .




Ring forceps
Apex


Lacerations of the Cervix
UNILATERAL TRANSVERSE
BILATERAL TRANSVERSE
STELLATE
The trauma of difficult childbirth deliveries may tear the cervix, producing permanent transverse or stellate lacerations.

Uterine Rupture

- Prior Cesarean section = 1-2%
- Modern obstetrics = 1/10,000 to 1/20,000 in unscarred uterus
- In "Neglected labors", this accounts for many maternal deaths where modern obstetrical care is not available.

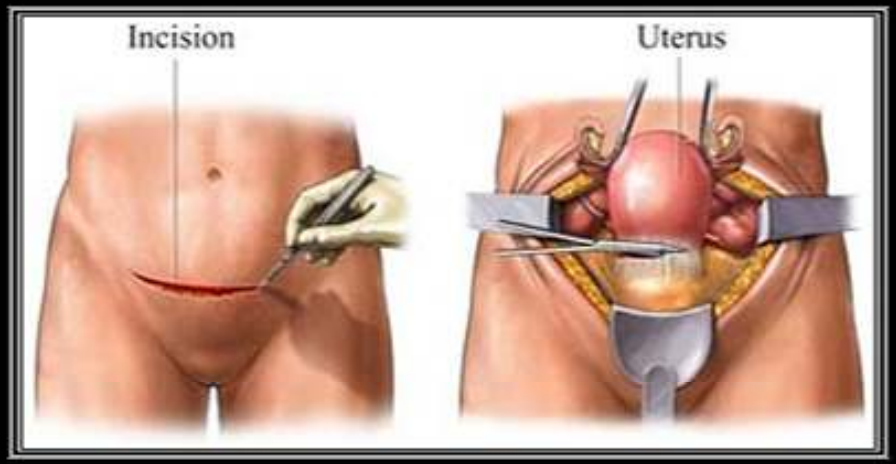
Classic Symptoms of Uterine Rupture

- Fetal distress
- Vaginal bleeding
- Cessation of labor
- Shock
- Easily palpable fetal parts
- Loss of uterine catheter pressure

Management of Uterine Rupture

Laparotomy

- Debride and repair in 2-3 layers of Maxon/PDS
- Subtotal Hysterectomy
- Total Hysterectomy



Other Considerations

Placenta accreta

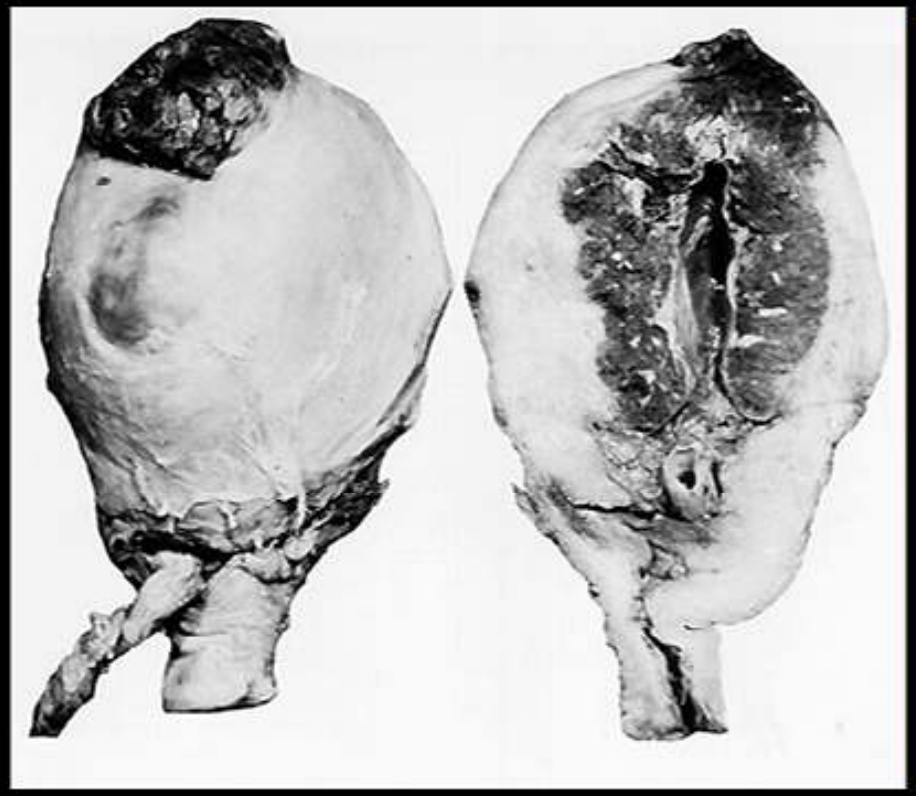
- Risk factors: placenta previa, prior CD, Asherman's syndrome, Previous curettage, Multiparity, prior myomectomy.
- 40 % risk if 2 prior CD + placenta previa
- If known, consider delivery at tertiary center

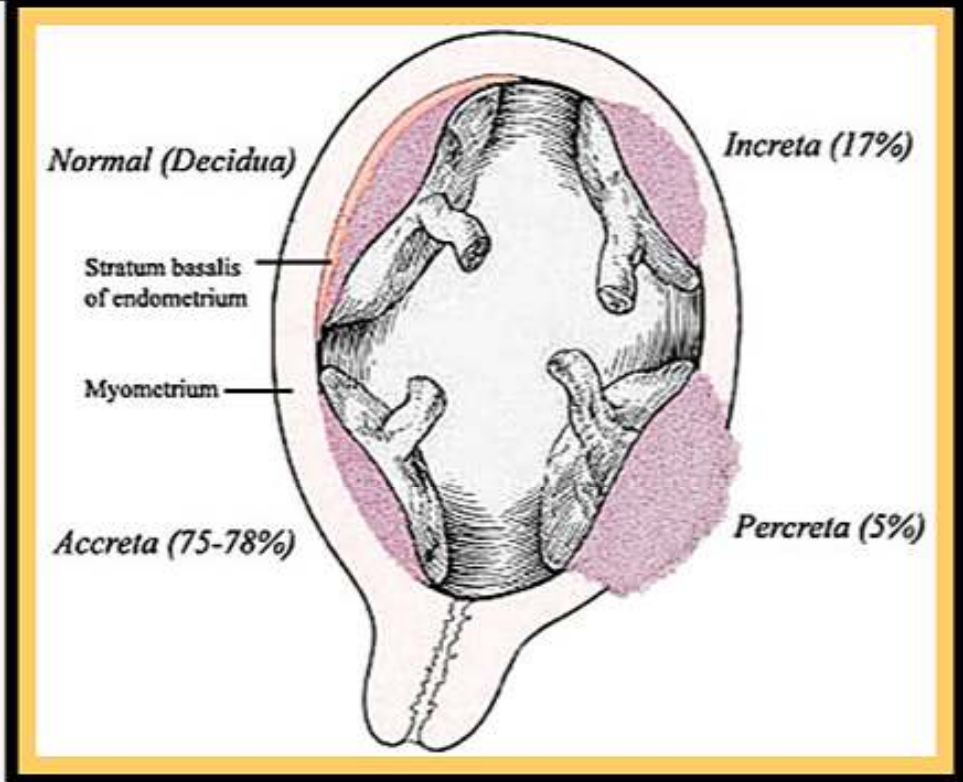
Arterial embolization

- Not for acute cases

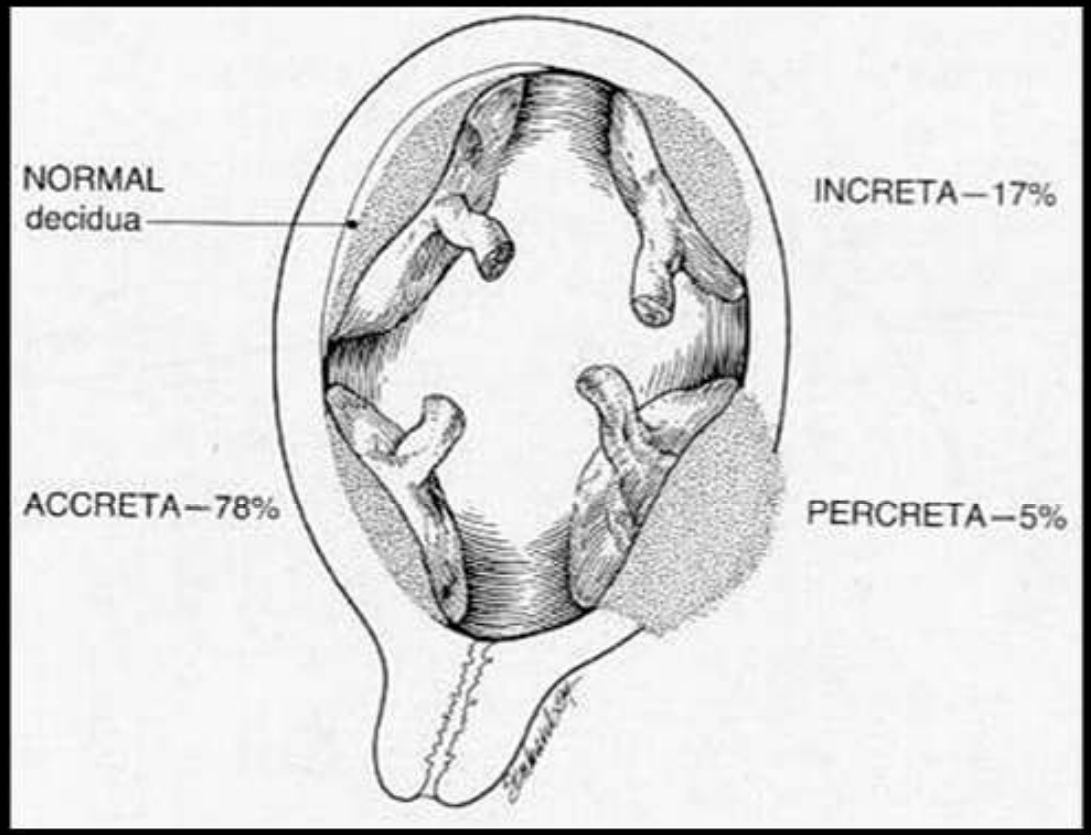
Bleeding from placental implantation cite

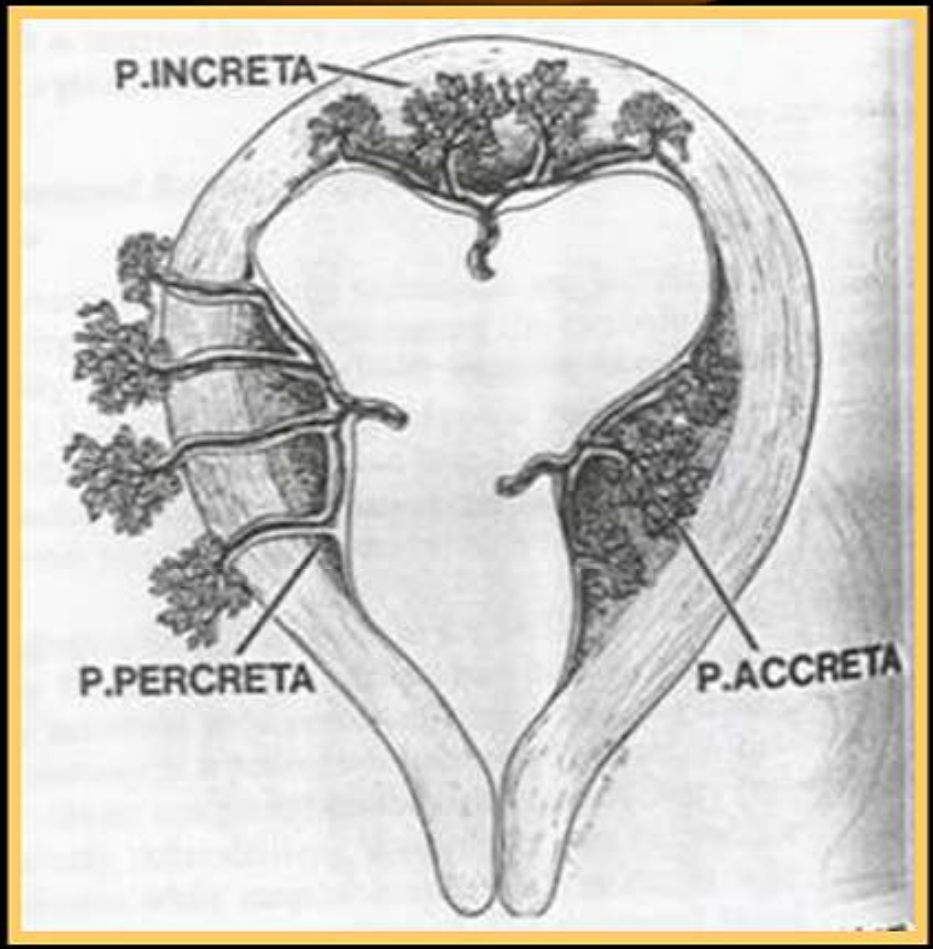
Abnormally adherent – accreta, increta, percreta.





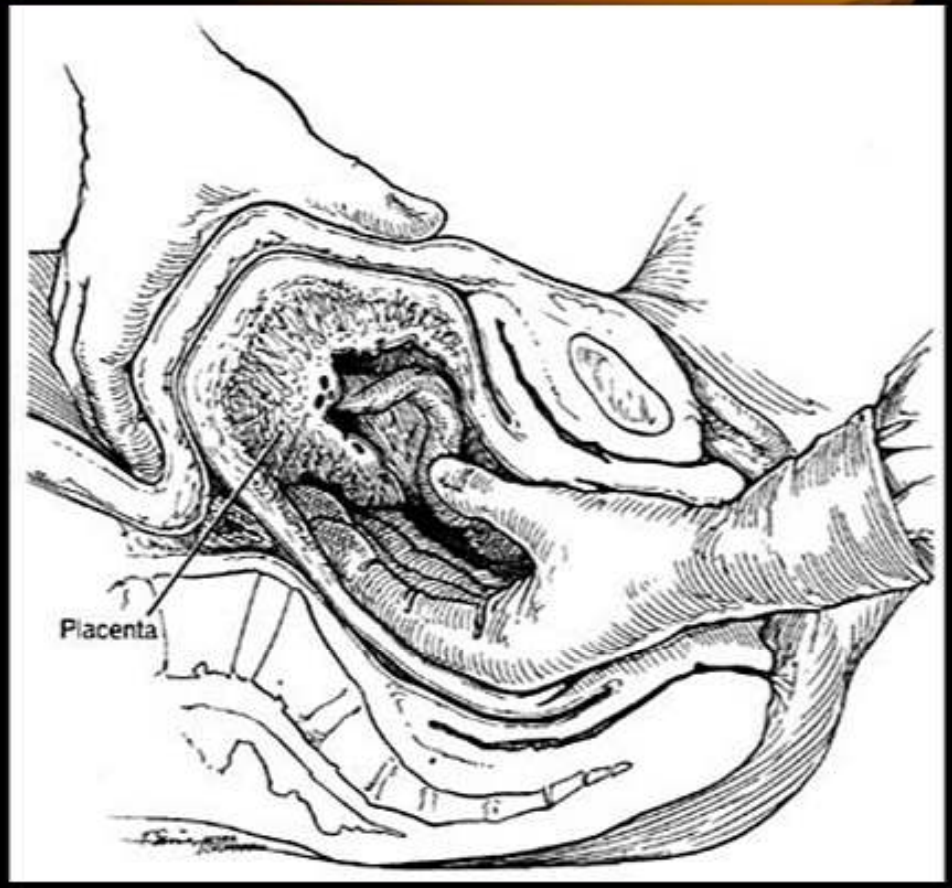
- Abnormally adherent – accreta, increta, percreta.

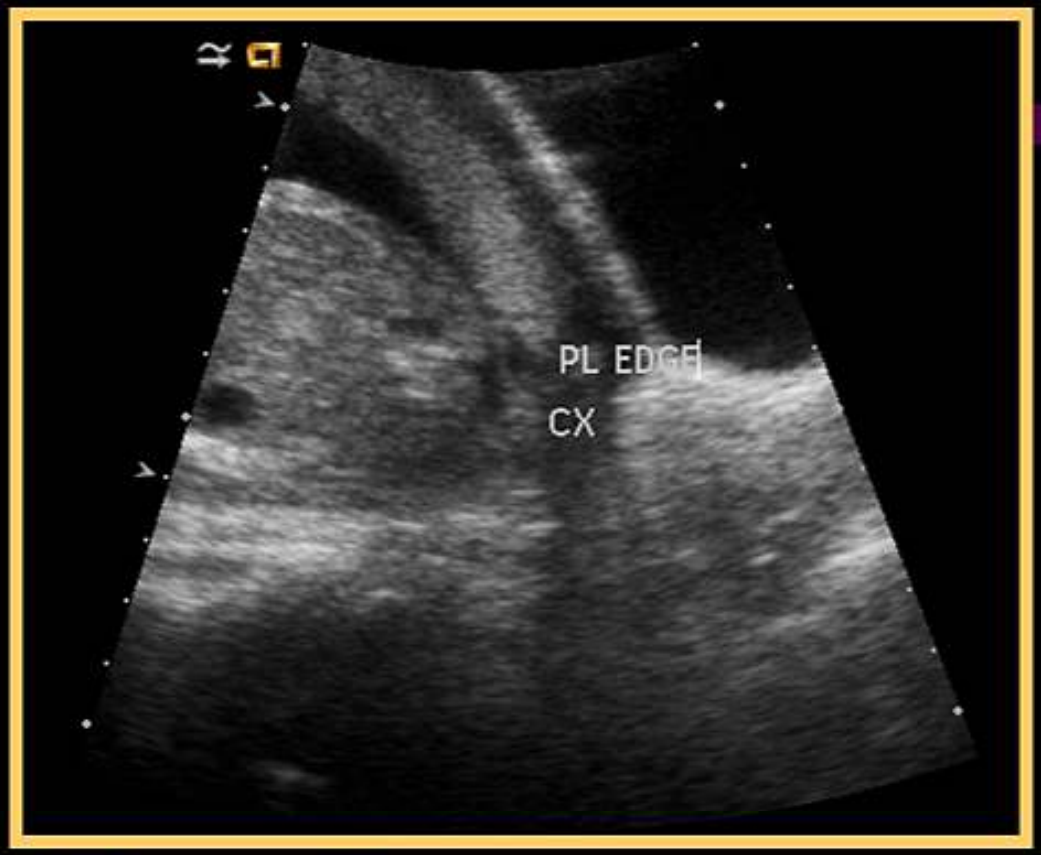


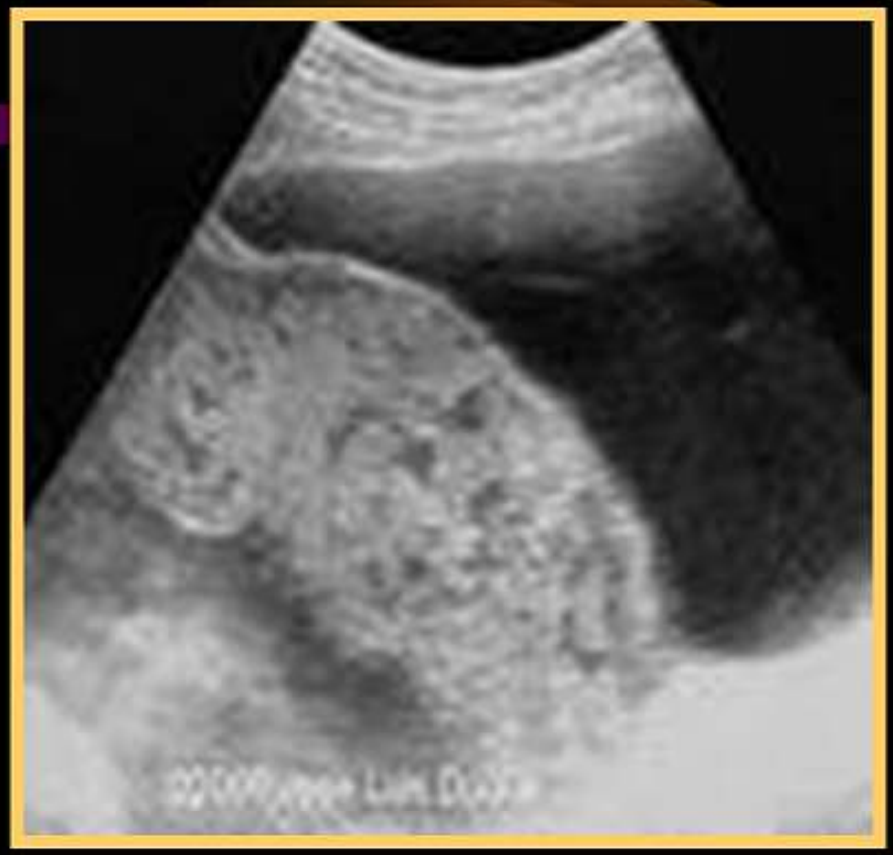


In the case of placental adherence bleeding stop, but in the case of placenta accreta, increta and percrata increase.

That's why in these cases manual removal of the placenta should be stopped immediately and hysterectomy should be performed







Diagnosis

- Ultrasound
- MRI

Management of Abnormal Placentation

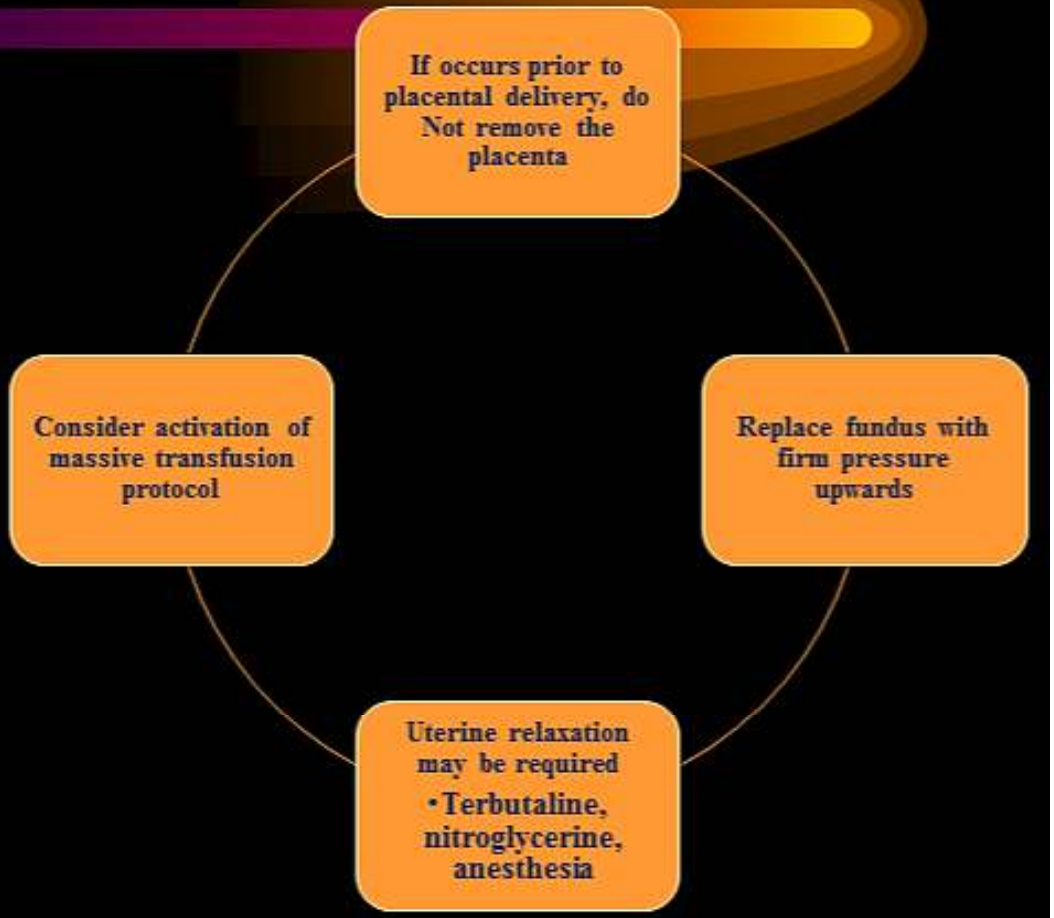
- Diagnosis of exclusion after adressing tone and truma
- Curettage of uterine cavity
- Leave placenta in situ
  - If not bleeding: Methotrexate
- Uterine, utero-ovarian, hypogastric artery ligation
- Subtotal/ total abdominal hysterectomy

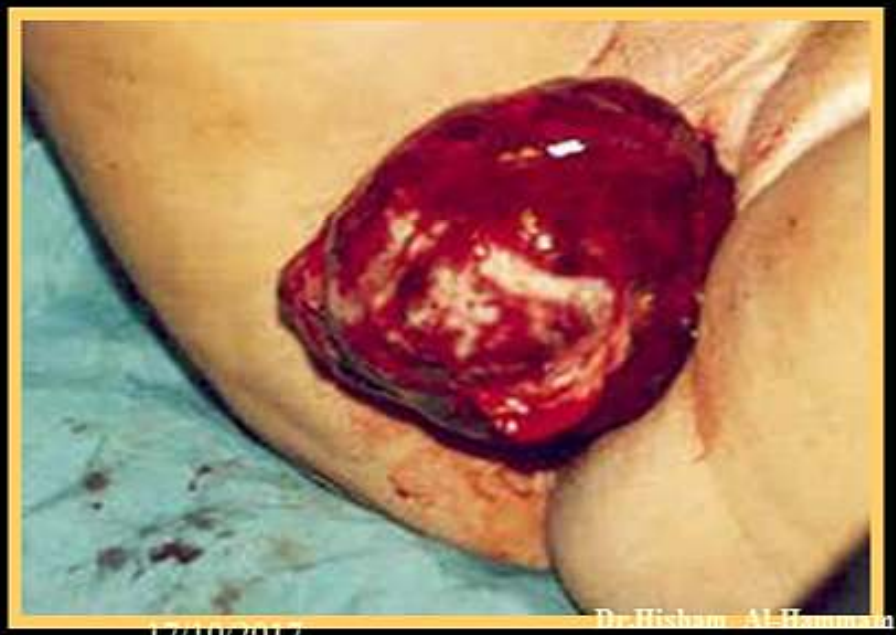
Other Considerations
Uterine inversion

ALSO

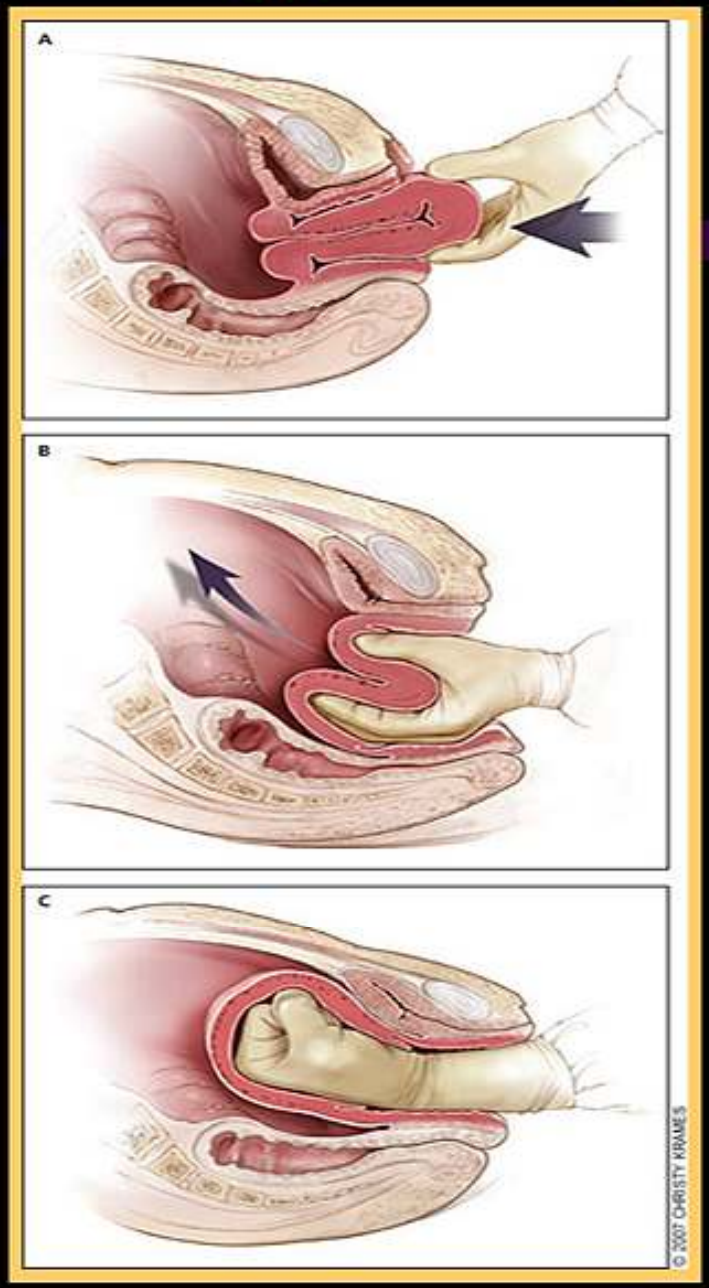
Uterine Inversion

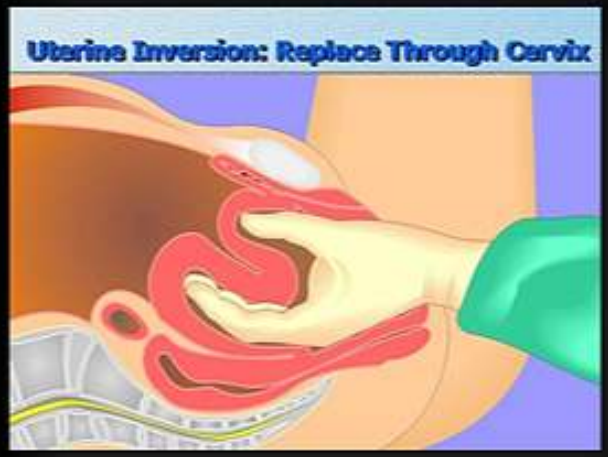
- Rare
  - Important to recognize quickly
- Suspect if shock disproportionate to blood loss
- Replace uterus immediately
- Watch for vasovagal reflex





Vaginal exploration cont'





Post-Hysterectomy Bleeding

Patient usually has DIC – Rx with whole blood, FFP, platelets, etc.

Transvaginal or transabdominal (pelvic) pressure pack

- **Bowel bag** with opening pulled through vagina cuff/ abd. Wall
- Stuff with 4 inch **gauze** tied end-to-end until pelvis packed tight

Military Anti-Shock Trousers (MAST)

Increases pelvic and abdominal pressure to reduce bleeding
Can use at any point in the procedure
Used when exploration is to be avoided

Secondary hemorrhage

Secondary hemorrhage occurs 24h to 6-12w

Causes include:

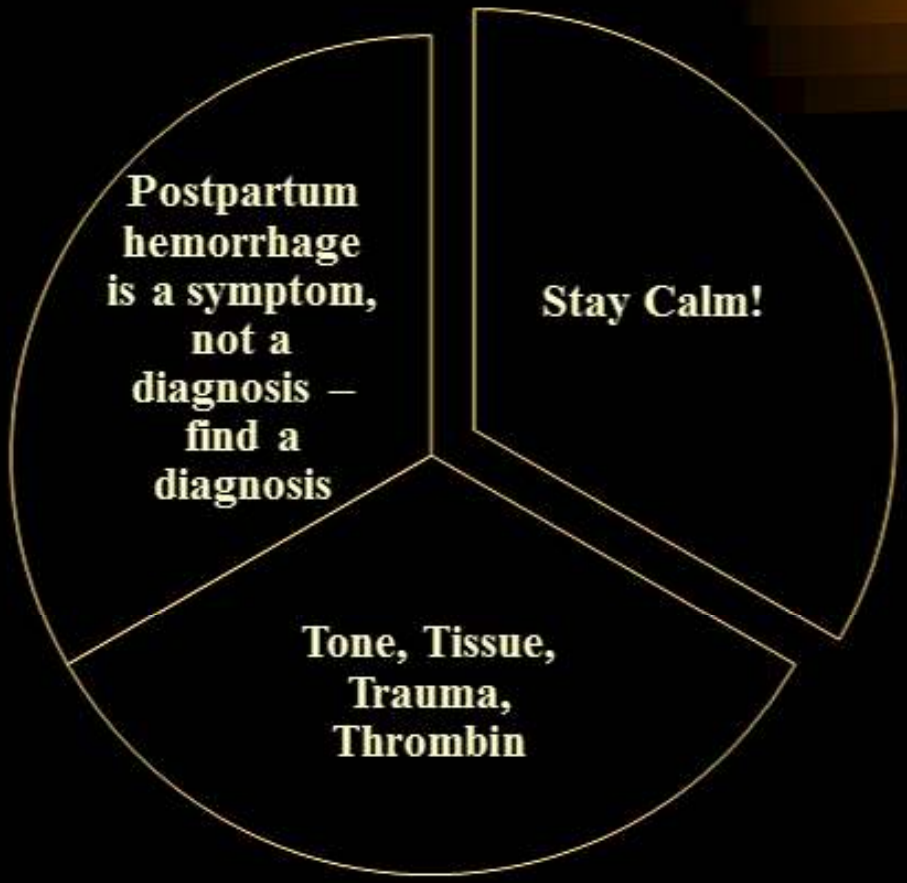
- **Subinvolution of pacental site**
- **Retained POC**
- **Infection (Endometritis)**
- **Disorders of coagulation (Inherited coagulation defects)**

Ultrasound examination will show whether there is retained placental tissue.

Management of Secondary PPH

- Evaluate for underlying disorders (coagulopathies).
- For atony give uterotonics.
- If large amount of bleeding, fever, uterine tenderness, or foul smelling discharge, treat for endometritis.
- Consider suction curettage.

Review


Postpartum hemorrhage is a symptom, not a diagnosis – find a diagnosis
Stay Calm!
Tone, Tissue, Trauma, Thrombin

THANK YOU