

# Post Partum Hemorrhage

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# Introduction

**Postpartum haemorrhage is a major cause of maternal morbidity and mortality accounting for 25% of maternal deaths worldwide**

# Definitions

**PPH is defined as:**

- **Blood loss  $\geq 500$ cc after normal vaginal delivery**
- **$>1000$ cc blood loss after cesarean section or**
- **$>1500$ cc blood loss after elective CS hysterectomy**
- **$>3000-3500$ cc for emergent Cesarean hysterectomy**
  
- **ACOG 10% drop in hematocrit value between admission & PP period, or a need for blood transfusion**

# Classification of PPH

- **Primary: Blood loss within 1st 24 hours of delivery. (EARLY)**
- **Secondary: Blood loss from 24 hours to 12 weeks postpartum. (LATE)**

# Causes of Primary Post Partum Hemorrhage

Uterine (90 %)

1. Uterine atony (70-80%)
2. Abnormal placental separation:  
Retained placental products ,  
Abnormal placentation
3. Uterine rupture
4. Uterine inversion

Non-uterine (10%)

1. Lower genital tract lacerations
2. Pelvic hematomas
3. Coagulation disorders

# What are the mechanisms of and risk factors for postpartum haemorrhage?

<b>T</b> one	Uterine atony 70%
<b>T</b> issue	Retained tissue/clots (9%)
<b>T</b> rauma	laceration, rupture, inversion 20%
<b>T</b> hrombin	Coagulopathy 1%

4 Ts

# **Atonic postpartum haemorrhage**

- **Prolonged labour : more lactic acid in the uterine muscle**
- **Over distended uterus : Multiple pregnancy  
Polyhydramnios, Large fetus**
- **Obesity**
- **Pyrexia during labour**
- **Previous PPH or manual removal of placenta**
- **Abruption/previa**
- **Fetal demise**
- **Gestational hypertension**
- **Bleeding disorder**

# Predisposing Factors- Antepartum

- ▶ Previous PPH or manual removal of placenta
- ▶ Abruptio/previa
- ▶ Fetal demise
- ▶ Gestational hypertension
- ▶ Over distended uterus
- ▶ Bleeding disorder



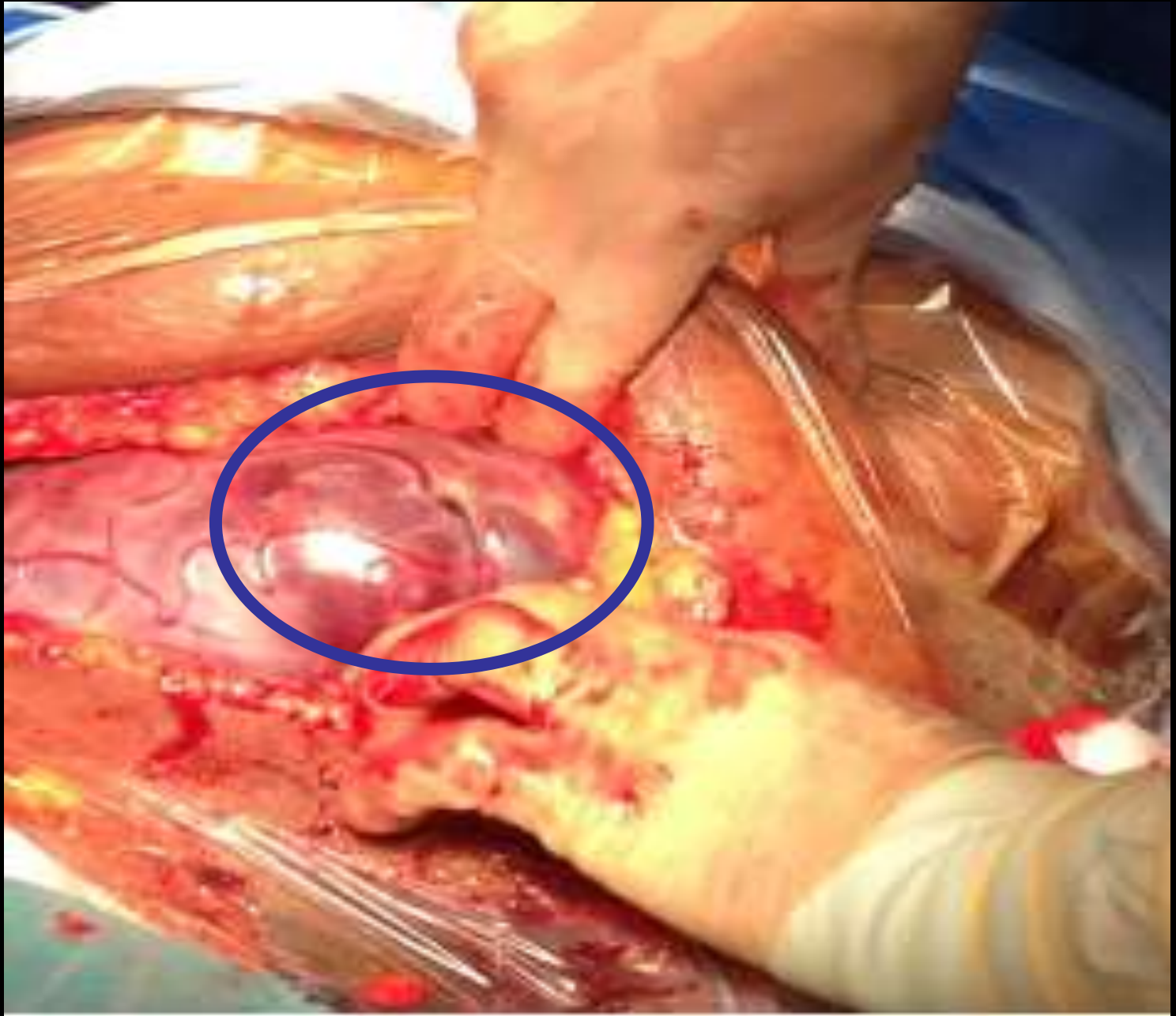
# Predisposing factors- Intrapartum

- ▶ Operative delivery
- ▶ Prolonged or rapid labour
- ▶ Induction or augmentation
- ▶ Choriomnionitis
- ▶ Shoulder dystocia
- ▶ Internal podalic version
- ▶ Coagulopathy

# Postpartum causes

- ▶ Lacerations or episiotomy
- ▶ Retained placental/  
placental abnormalities
- ▶ Uterine rupture / inversion
- ▶ Coagulopathy

**Rare causes of primary  
postpartum haemorrhage include  
uterine inversion  
placenta percreta as well as extra-genital  
bleeding**



**The commonest cause of  
secondary postpartum  
haemorrhage is  
Endometritis**

**The blood flow to the uterus at term >37 weeks is approximately 1000 mL of blood every minute**

**A fetus at term receives about 200 mL/kg/minute from the placenta**

# Obstetric shock index

Pulse rate divided by systolic blood pressure

$PR/SBP$

$PR/SBP > 1$  has been shown to be associated with substantial postpartum haemorrhage and the need for intensive resuscitation and blood transfusion

# Prevention

- **Be prepared**
- **Active management of third stage**
- **Prophylactic oxytocin :10 U IM ,5 U IV bolus ,10-20 U/L N/S IV @ 100-150 ml/hr**
- **Gentle cord traction with surapubic presser**



# Diagnosis

- **Assess in the fundus**
- **Inspect the lower genital tract**
- **Explore the uterus**
- **Retained placental fragments**
- **Uterine rupture**
- **Uterine inversion**
- **Assess coagulation**

# MANAGEMENT OF PPH

## Step 2 Directed Therapy

### **"Tone"**

- massage
- compress
- drugs

\* See Table III

### **"Tissue"**

- manual removal
- curettage

### **"Trauma"**

- correct inversion
- repair laceration
- identify rupture

### **"Thrombin"**

- reverse
- antiacoagulation
- replace factors

# Management algorithm

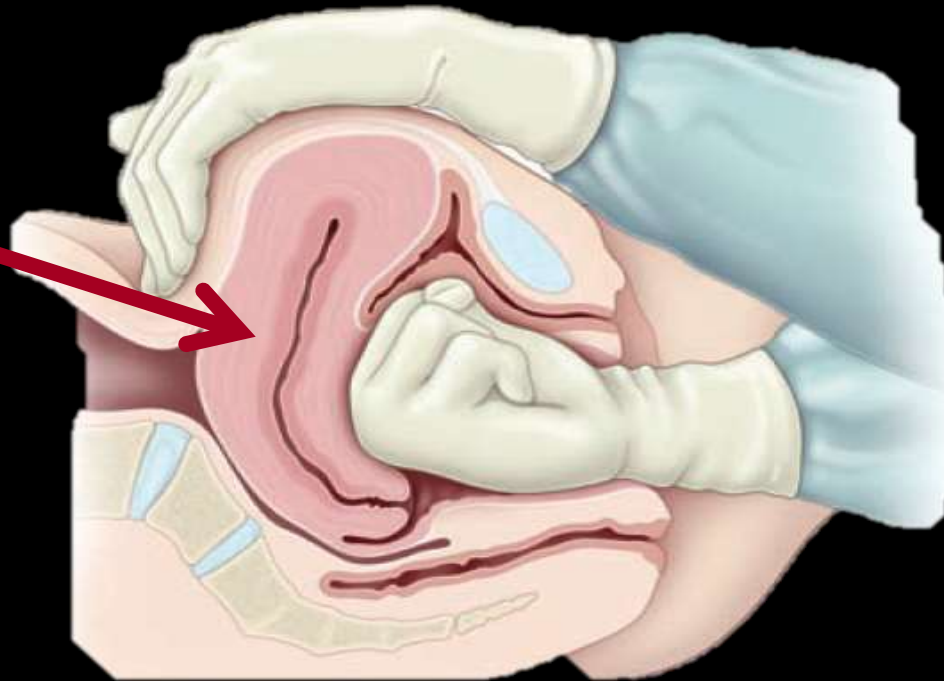
**HAEMO-STASIS**

- **H—Ask for help and hands on uterus (uterine massage**
- **A—Assess (that is, ABC) and resuscitate (that is, intravenous fluids crystalloid , send CBC ,X mach, Coagulation screen**
- **E—Establish etiology, ensure availability of blood, and ecbolic (drugs that induce contractions of the uterus, oxytocin or ergometrine)**
- **M—Massage the uterus**
- **O—Oxytocin infusion (10 U/hour) or intramuscular prostaglandins (250 µg)**
- **S—Shift to theatre, with aortic compression, bimanual compression, or anti-shock garment (for low resource settings before transfer to a tertiary center) as appropriate**

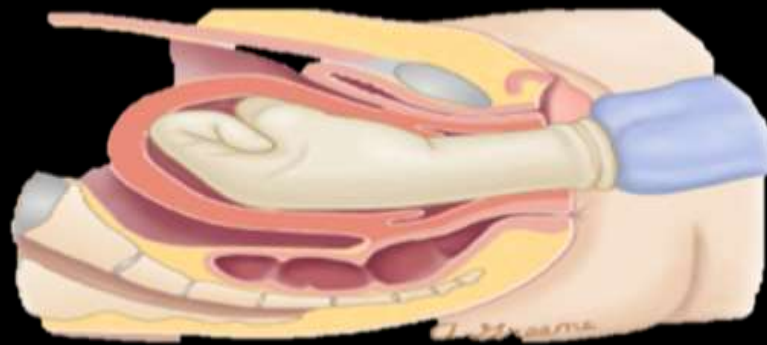
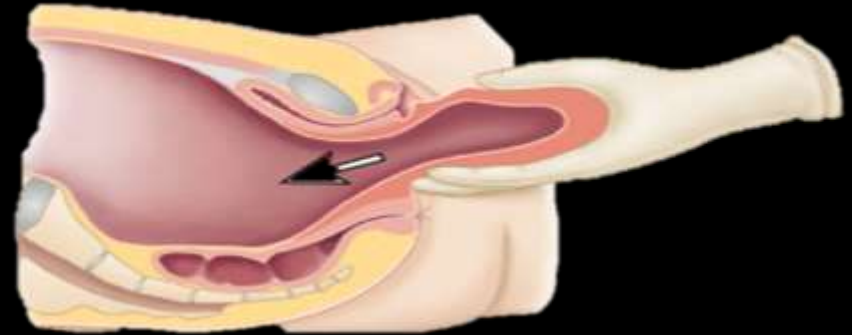
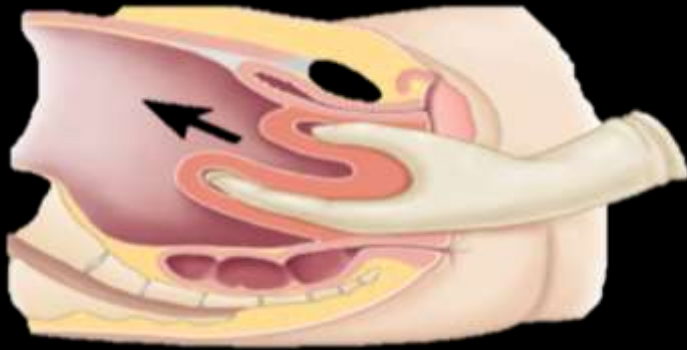
- **T—Tamponade** by balloon or uterine packing after exclusion of retained tissue and trauma. Administer intravenous **t**ranexamic acid (1 g)
- **A—Apply** compression sutures on the uterus (B-Lynch or modified technique)
- **S—Systematic** pelvic revascularization (uterine, ovarian, quadruple. or internal iliac)
- **I—Interventional** radiology and, if appropriate, uterine artery embolization
- **S—Subtotal** or total abdominal hysterectomy

# Bimanual compression of the uterus

Uterus



# Replacement of Inverted Uterus



# Drugs used in treatment of postpartum haemorrhage

## First line drugs

- **Oxytocin** :which is secreted by the supraoptic and paraventricular nuclei of the hypothalamus and is stored in the posterior pituitary gland)
- **Mode of action**—Myometrial contraction and retraction; increases basal uterine tone
- **Side effects**—Nausea, vomiting, headache
- **Ergometrine** (ergot alkaloid)
- **First line drug in developing countries**
- **Mode of action**—Arterial vasoconstriction and myometrial contraction
- **Side effects**—Vomiting, headache, hypertension, chest pain, palpitations, bradycardia, Raynaud's syndrome, pulmonary oedema



## **Second line drugs :**

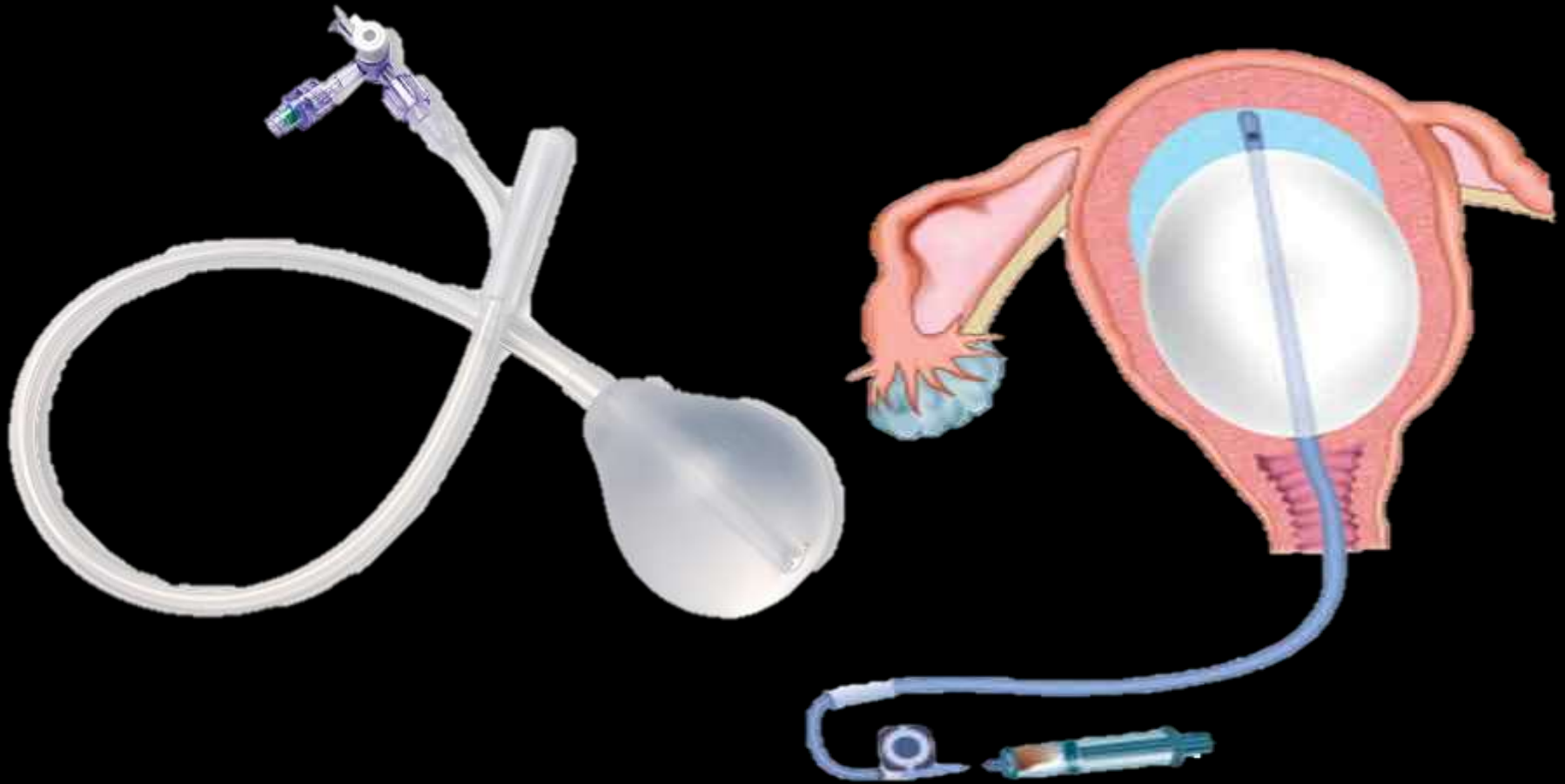
- **Tranexamic acid**
- **Mode of action—Anti-fibrinolytic which prevents the breakdown of preformed blood clot and therefore stabilizes the clot**
- **Side effects—Hypotension, diarrhea, thromboembolic events**
- **Recent Cochrane review of 10 randomized controlled trials (RCTs) reported that blood losses >400 mL or >500 mL and >1000 mL were less common in women who received tranexamic acid compared with placebo or no intervention (risk ratios 0.52 (95% confidence interval 0.42 to 0.63) and 0.40 (0.23 to 0.71), respectively**

- **Misoprostol**
- (prostaglandin analogue)
- Mode of action—Myometrial contraction
- Side effects—Diarrhoea, rash, dizziness, vomiting
- Not found to be effective after administration of oxytocin and may increase adverse effects
  
- **Prostaglandins F<sub>2α</sub>**
- Mode of action—Myometrial contraction
- Side effects—Bronchospasm, cardiovascular system collapse, dyspnoea, hypertension, vomiting, pulmonary oedema
- No robust evidence of effectiveness

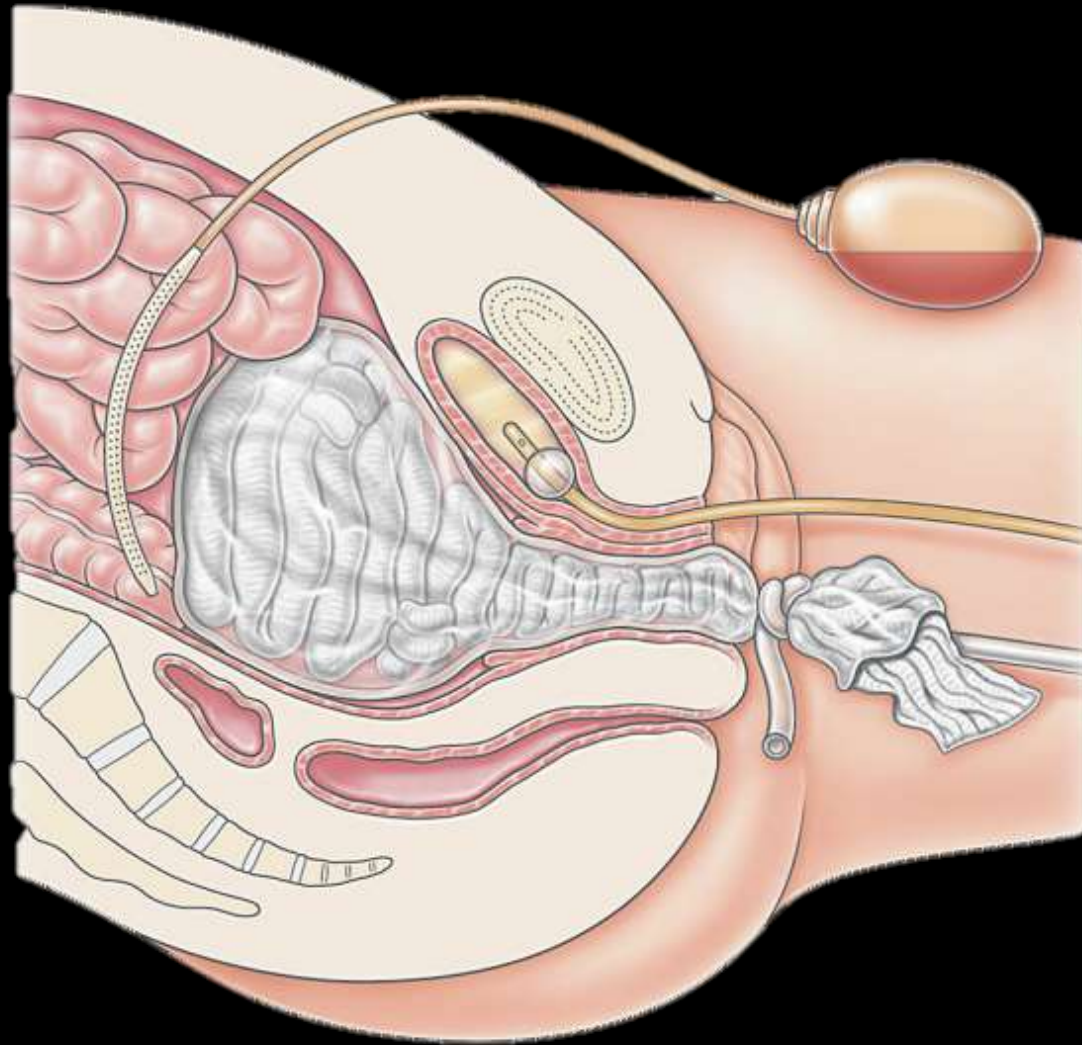
- **Carbetocin :**
- **(synthetic oxytocin analogue)**
- **Mode of action—Myometrial contraction**
- **Side effects—Diarrhoea, hypotension**
  
- **Cochrane review of 11 RCTs concluded that use of carbetocin statistically significantly reduced the need for therapeutic uterotonics (risk ratio 0.62 (0.44 to 0.88) compared with oxytocin for women who underwent caesarean section but not for vaginal delivery**  
**There was no robust evidence to suggest that carbetocin was better than oxytocin in reducing postpartum haemorrhage, and its cost effectiveness remains unclear**

- **Syntometrine :**
- **(combination of 5 units of oxytocin and 0.5 mg of ergometrine)**
- **Mode of action—Myometrial contraction**
- **Side effects—Nausea, vomiting, diarrhoea**
  
- **Cochrane review of 4 RCTs that compared carbetocin and syntometrine showed a lower mean blood loss in women who received carbetocin (mean difference  $-48.84$  mL (95% CI  $-94.82$  to  $-2.85$  mL**

# Uterine balloon tamponade



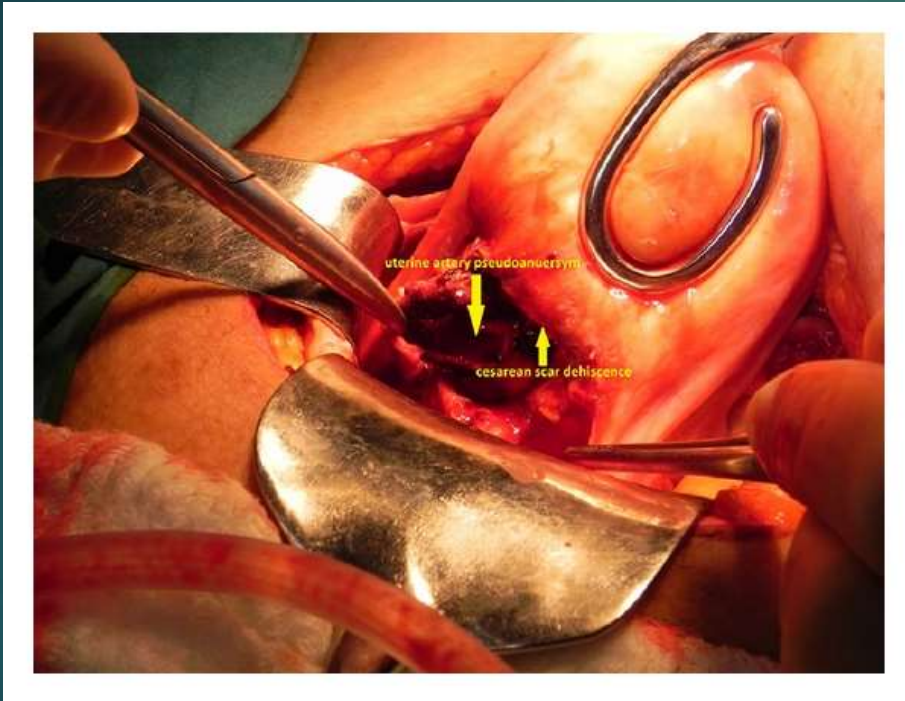
# Uterine Packing



# Stepwise Uterine Devascularization Technique

- \* Unilateral uterine vessel ligation .
- \* Bilateral uterine vessel ligation .
- \* Bilateral low uterine vessel ligation .
- \* Unilateral ovarian vessel ligation .
- \* Bilateral ovarian vessel ligation .
- \* **Internal Iliac Artery Ligation**

# 1-Uterine artery ligation



\*It's a fertility preserving procedure.

\* It is hemostatic by reducing pulse pressure to uterus as 90% of its blood supply is from uterine vessels.

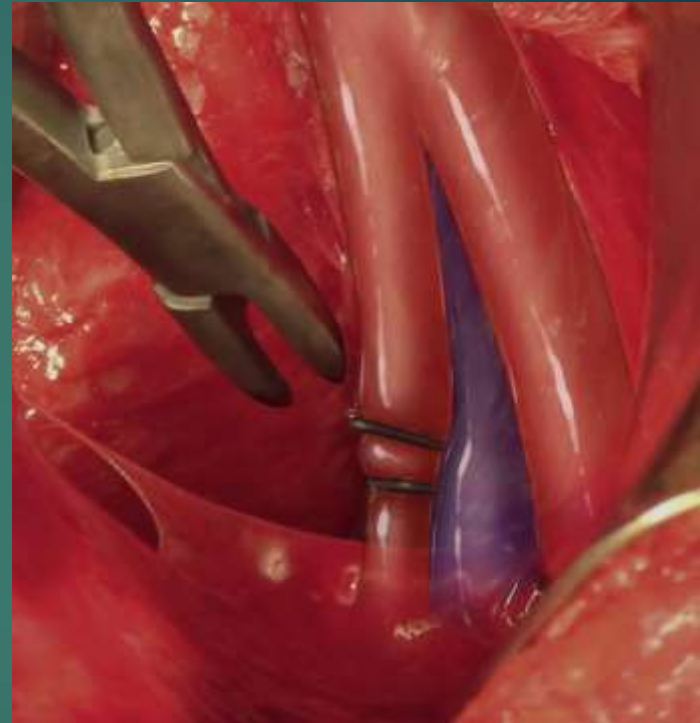
\* Collateral circulation & recanalization of uterine vessels will be established within 6-8 wks .

**\*It has a success rate of 95 %**



# 2-Internal iliac artery ligation

- ⑩ Bilateral ligation of the artery reduces the pelvic arterial blood flow by 49% and pulse pressure by 85% . After bilateral ligation of IIA in the long term period, **the collateral circulation will maintain the re-functioning of the IIA**
- ⑩ **40-60% success rate.**
- ⑩ Currently has fallen out of favor because of difficult techniques, instead ,a stepwise progression of uterine-ovarian vessel ligation should be rapidly performed.



# 3-Angiographic Selective Embolization

\* **90-100 % Success.**

\*ASE seems to be indicated in patients with **birth canal trauma or uterine atony or DIC.**

Done in centers with interventional radiologists .

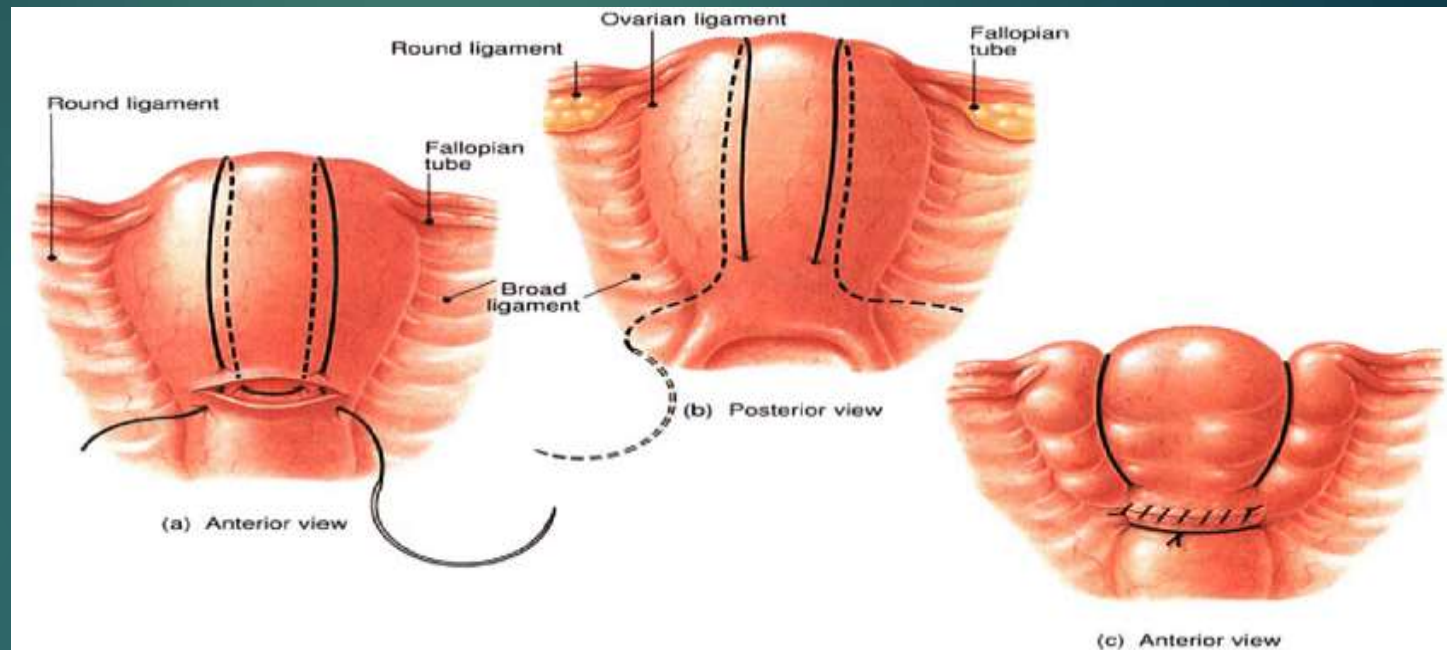
\***Complications:-**

- 1) Fever
- 2) pelvic infection
- 3) contrast media nephrotoxicity
- 4) buttock claudication

**They are rare only reported in 6-7% of the cases.**

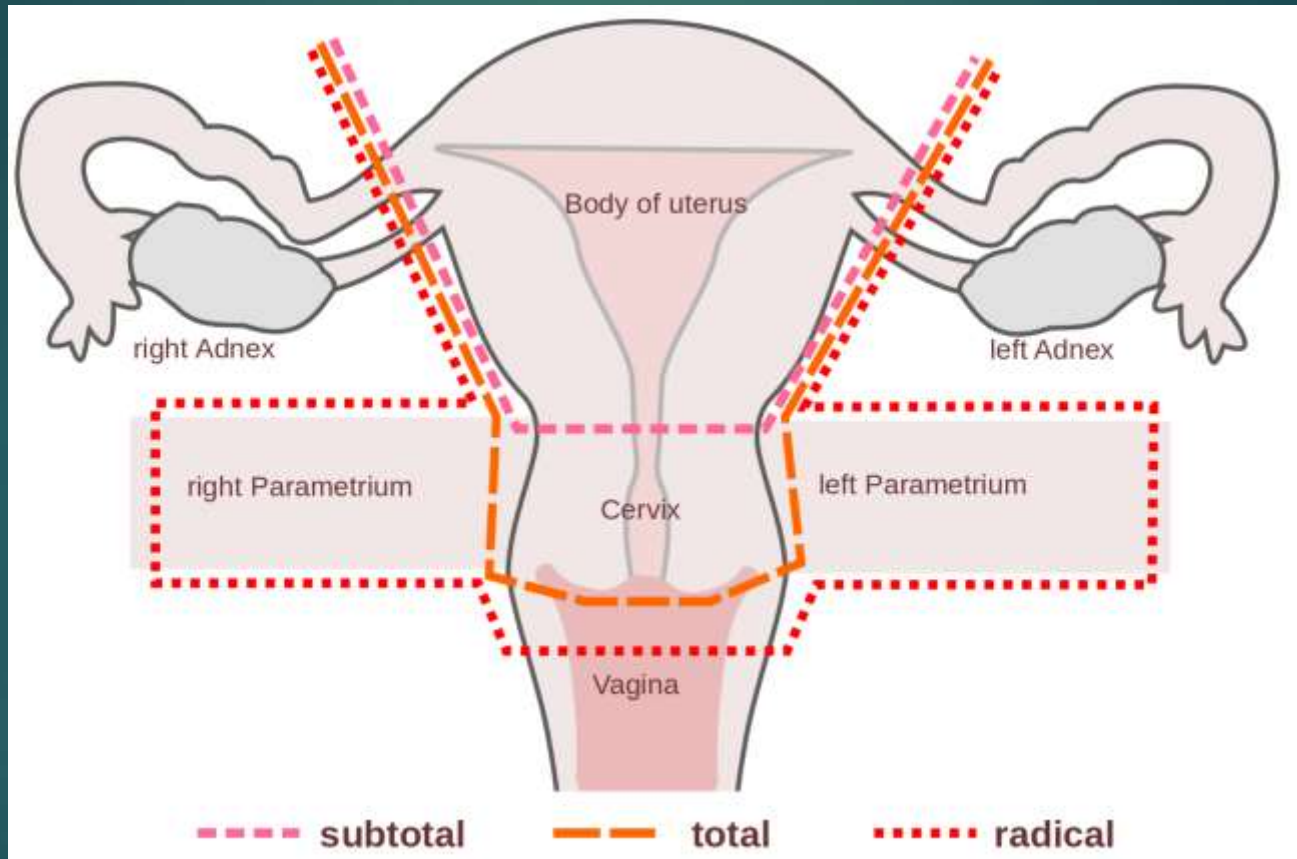
# 4-B-Lynch Suture

\* B-Lynch is a **uterine compression suture**, which apposes the anterior and posterior wall through a pair of vertical brace sutures which are put around the uterus.



\* It helps us effectively to avoid the need for hysterectomy in patients in whom medical treatment have failed to stop intractable PPH due to uterine atony.

If patient doesn't want to preserve fertility :  
Hysterectomy is done



# Maternal morbidity

- **Transient or permanent renal damage**
- **Acute respiratory dysfunction**
- **Abscess formation 2ry to infection of pelvic hematomas**
- **Frequent need for additional surgical procedures**
- **Transfusion related hepatitis & AIDS**
- **Long term sequel: Sheehan's Syndrome**

# Conclusions

- **Postpartum hemorrhage remains the second leading direct cause of maternal deaths in the north Europe and the leading cause of maternal mortality in the world**
- **Poor uterine tone accounts for about 70-80% of all cases of primary postpartum haemorrhage, whereas endometritis is the commonest cause of secondary postpartum haemorrhage presenting up to 12 weeks after delivery**
- **Tranexamic acid is recommended for all women with atonic and traumatic postpartum haemorrhage as well as for ongoing haemorrhage during a caesarean section**
- **Refer women with secondary postpartum haemorrhage after birth for ultrasonography to exclude retained products of conception or endometritis**
- **Start broad spectrum antibiotics in women with secondary postpartum haemorrhage due to endometritis**

# Conclusions

- **Check the woman's temperature and exclude uterine tenderness, offensive vaginal discharge, or failure of uterine involution (2ry PPH)**
- **If a woman presents with vaginal bleeding up to 12 weeks after delivery , do you palpate her abdomen for uterine size, tone, and tenderness?**

**The uterus should not be palpable per  
abdomen by day 14  
a palpable uterus at this stage should make  
you suspect endometritis or retained  
products of conception**



**Thank you**