POST-PARTUM HAEMORRHAGE

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Causes of PPH: The Four "T's"©

- Tone (70%)
- Trauma (20%)
- Tissue (10%)
- Thrombin (1%)

Massive haemorrhage

- Summon senior multidisciplinary help
- Resuscitate
- Replace and maintain fluid volume
- Investigate status and cause of bleeding
- Arrest blood loss

Secondary PPH

1. Retained products of conception
2. Placenta Accreta
3. Pelvic hematoma
4. Cervical Injury
5. Uterine inversion
6. Rupture of Uterus

RETAINED PLACENTA

in 2% of deliveries

-Anticipate haemorrhage, insert an intravenous infusion line, take blood for full count, group, save and catheterize

- Check that the placenta is not in the cervical canal or vagina prior to giving anaesthetic

- Give prophylactic antibiotics

- Carry out manual removal – call senior help if there is accrete and/or heavy bleeding

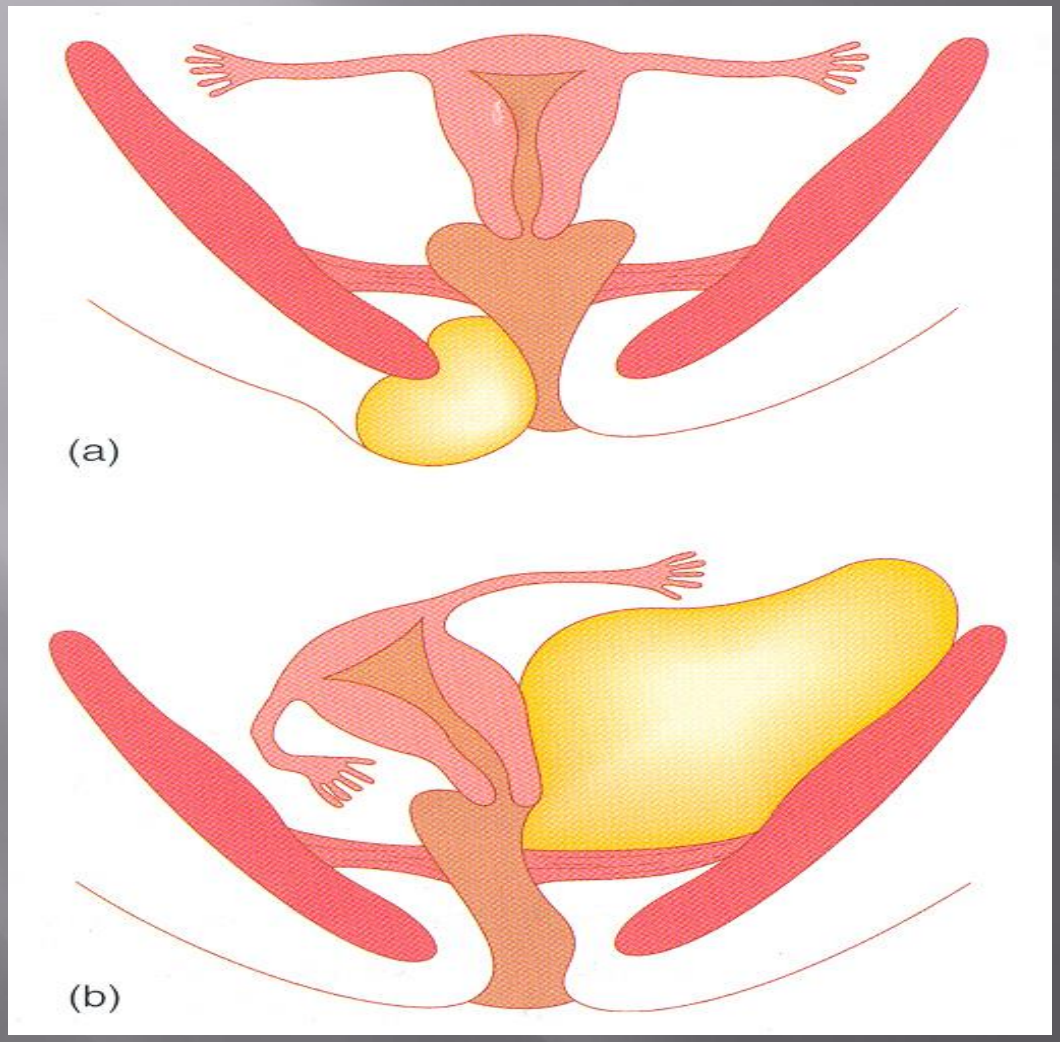
PLACENTA ACCRETA

1. Hysterectomy

2. Simple excision of the site of trophoblast invasion with over sewing of the area to the uterine

3. Internal iliac artery ligation

HAEMATOMAS



(a) Vulval

(b) Para vaginal hematoma

HAEMATOMAS

- Vulval and paravaginal haematomas

Definition

1. Infralevator haematomas include those of the vulva and perineum, as well as paravaginal haematomas and those occurring in the ischiorectal fossa
2. Supralevator haematomas spread upwards and outwards beneath the broad ligament or partly downwards to bulge into the walls of the upper vagina.

These haematomas can also track backwards into the retroperitoneal space.

- Observation to limit haematomas

1. Ice packs
2. Pressure dressings
3. Appropriate analgesia

Need for surgical interventions

1. Haematomas >5cm in diameter
2. Rapidly expanding

HEMATOMA MGT.

- **Technique**

  The incision should be made via the vagina. If a figure of eight suture does not achieve haemostasis, either a drain or a pack can be used.

- Large vulval haematomas benefit from drainage:
  - leave the wound open
  - leave a drain

INJURIES TO THE CERVIX

After a vaginal delivery, lacerations and/or bruising of the cervix is common.

→Bleeding does not appear to be arising from the vagina or perineum and which continues despite a well-contracted uterus is an indication for examining the cervix.

→ Deep lacerations, and particularly those that involve the vaginal vault, need to be managed in theatre under anaesthesia.

Injury to cervix -Management

Prompt recognition of the injury and action to control the bleeding are essential

Repair

For repairing a cervical tear,

good visibility

right-angle retractors

Using two pairs of ring forceps trace cervix. Identification of the apex of the tear is essential before commencing repair.

Injury to cervix

- Key Points

- The cervix often looks damaged but is very rarely associated with bleeding

- Ventouse prior to full dilation has been implicated in injury to the cervix

UTERINE RUPTURE

Rupture or tearing, _ A previous scar uterus, typically previous Caesarean section.,hysterotomy,

Unrecognized perforation of the uterus in a previous termination of pregnancy. Almost all cases occur in labour.

Patients Complain

1. Continuous abdominal pain
2. Vaginal blood loss
3. Contractions cease
4. The fetal heart rate pattern becomes abnormal

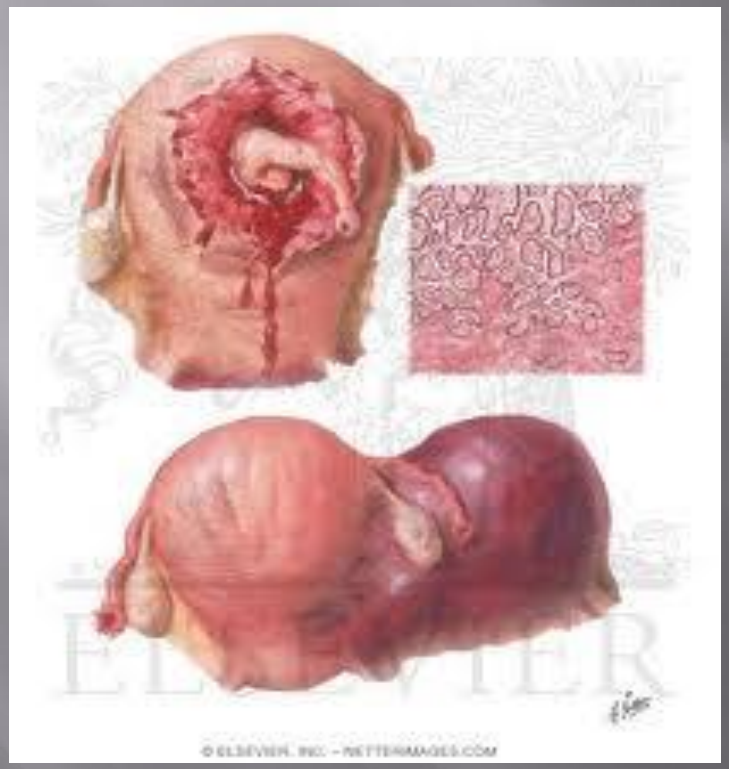
UTERINE RUPTURE-MGT

Rupture second stage of labour - not recognized. Baby delivery- by ventouse or forceps for 'fetal distress'.

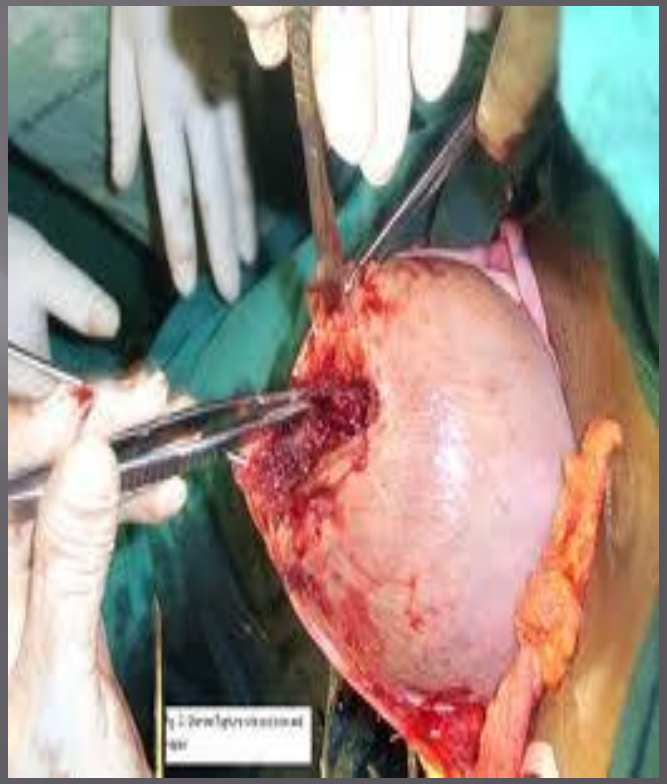
The mother will bleed internally and shows signs of circulatory collapse whilst complaining of abdominal discomfort.

→ Immediate laparotomy is necessary when uterine rupture is suspected. Sometimes it is possible to repair the uterus, but frequently the only safe way forward is hysterectomy.

RUPTURE UTERUS

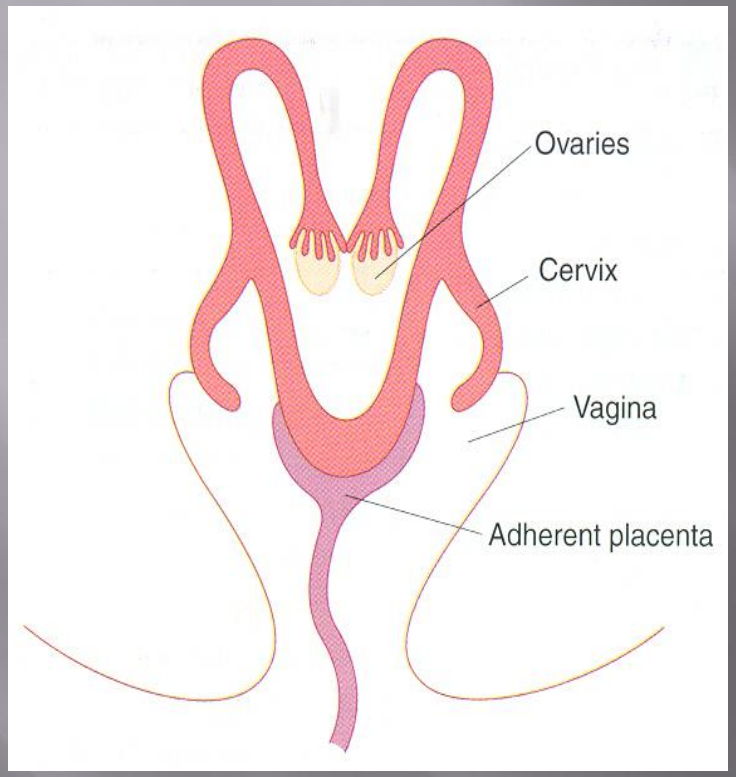


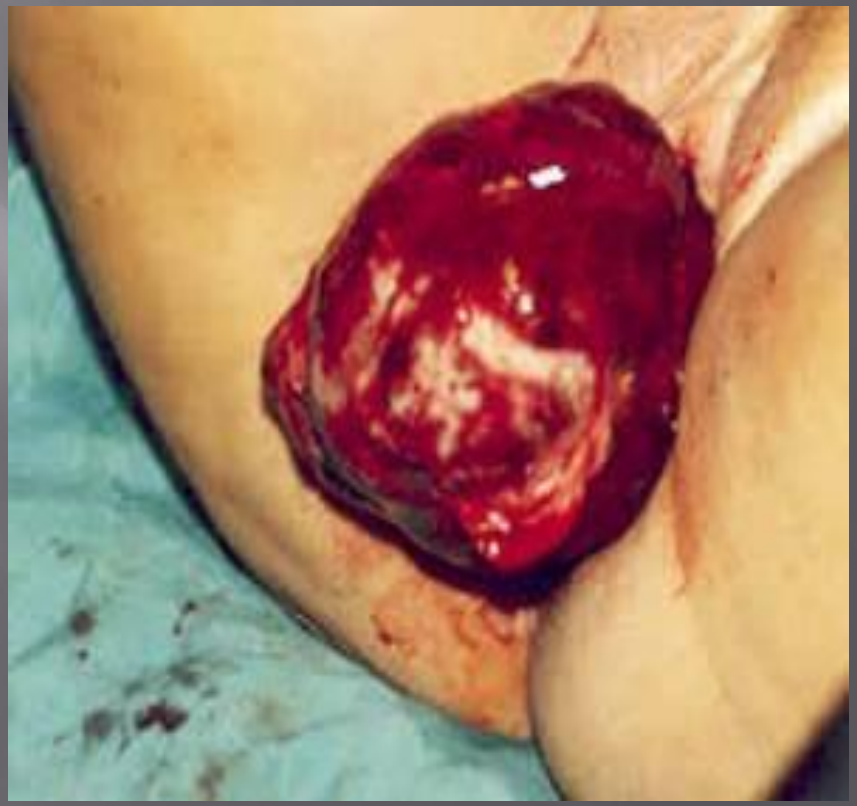
RUPTURE



SURGICAL REPAIR

UTERINE INVERSION





UTERINE INVERSION

- The patient may be shocked out of all proportion to visible blood loss.
- Do not remove the placenta if it is still attached; this will increase the bleeding.
- Immediately replace the uterus through the cervix by manual compression.

Management- Continued Uterine Bleeding

- Consider coagulopathy
- Correct coagulopathy
  - FFP, cryoprecipitate, platelets
- If coagulation is normal
  - Consider embolization
  - Prepare for O.R.

CONSUPMTIVE COAGULOPATHY (DIC)

- A complication of an identifiable, underlying pathological process against which treatment must be directed to the cause
- PATHOPHYSIOLOGY
- Bleeding
- Circulatory obstruction→organ hypoperfusion and ischemic tissue damage
- Renal failure, ARDS
- Microangiopathic hemolysis

DIC - Treatment

- Identify and treat source of coagulopathy

- Correct coagulopathy
- FFP, cryoprecipitate, platelets

The PPH Problem -Management Challenges

- The New Technologies
  - Measuring Blood Loss
  - Balloon Tamponade
  - Anti-shock Garments
  - New Intra –Operative Surgical Techniques
- Advancing the New Technologies

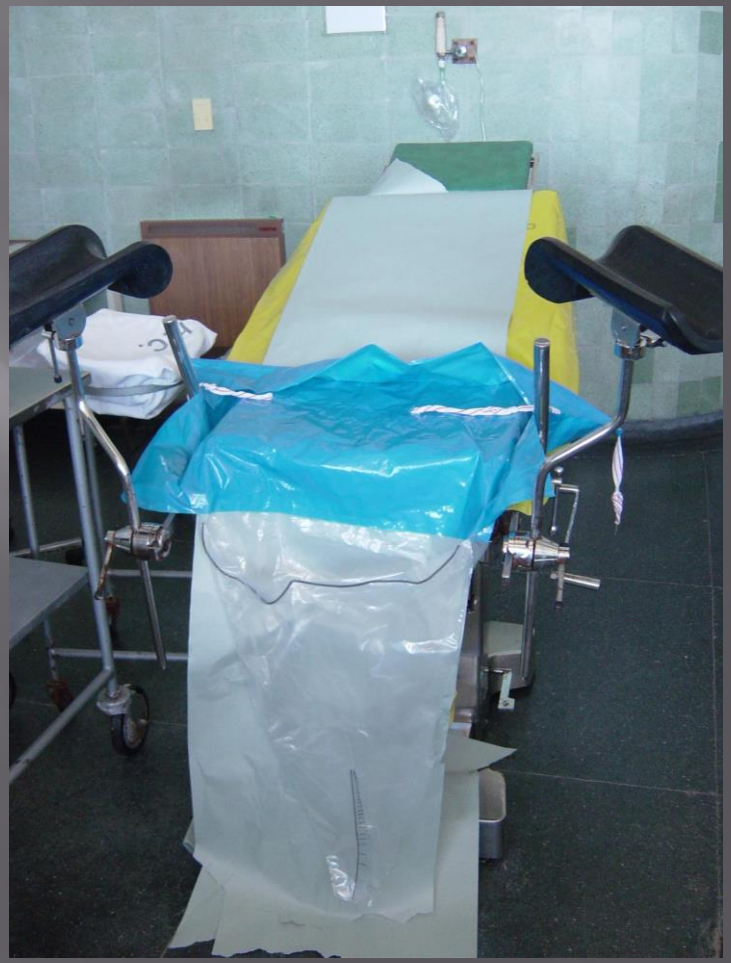
Measuring Blood Loss

- A key step to EFFECTIVE TREATMENT . . . . .
- The Diagnosis of PPH - Quantitative
  Underestimation leads to delayed intervention.
- Visual estimated amounts of blood loss are notoriously far from accurate by as much as 30-50%: especially for very large amounts.
- Old methods for estimating blood loss more accurately tend to be complex.

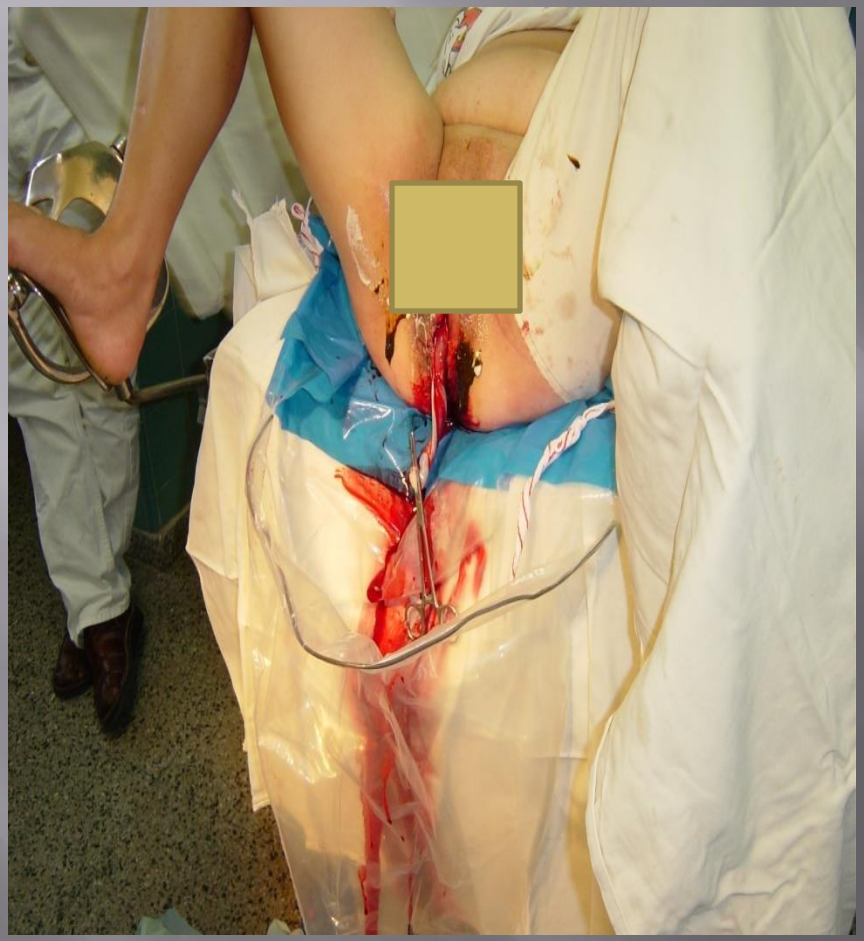
  weighing soaked clothes and pads,
  collection into pans etc.,
  Acid haematin techniques,
  Spectrophometric technics and

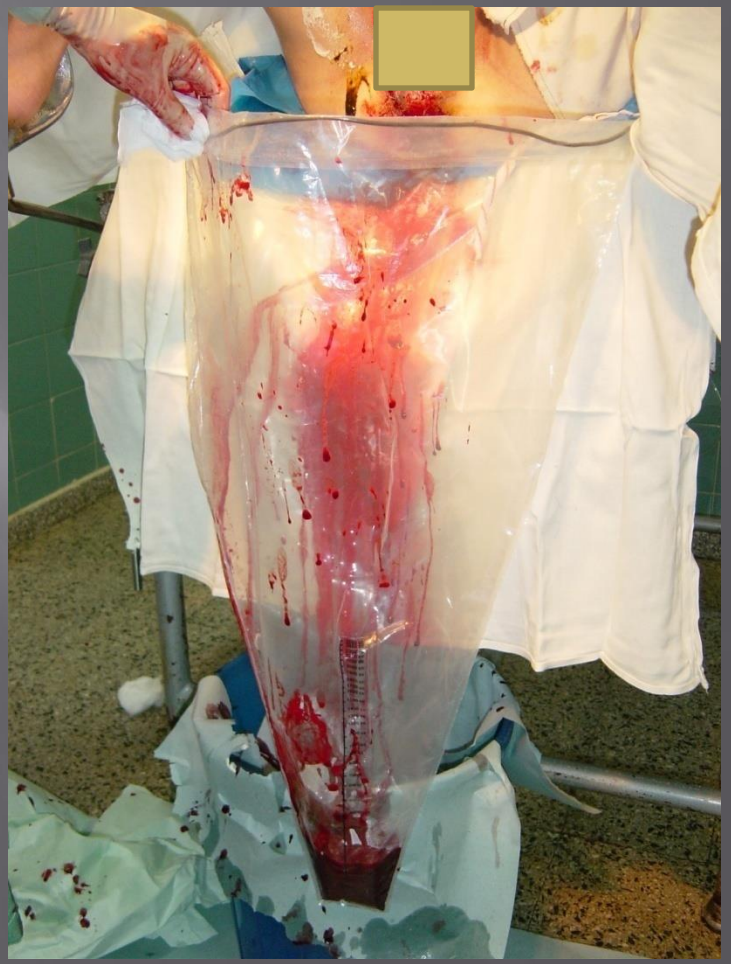
THE BRASSS-V DRAPE

A low cost calibrated plastic blood collection drape.



BRASSS-V DRAPE:
Direct measurement of blood loss (PPH)





Measuring Blood Loss in PPH

Blood Loss (n = 434)	
Mean ± SE	265.18 ± 10.95
Range	20 - 1600
Median	200
Mode	100
Acute PPH	57 (13.2 %)
Acute severe PPH	8 (1.8 %)

Goudar, Eldavitch, Bellad, 2003

Advantages of Brasss-V

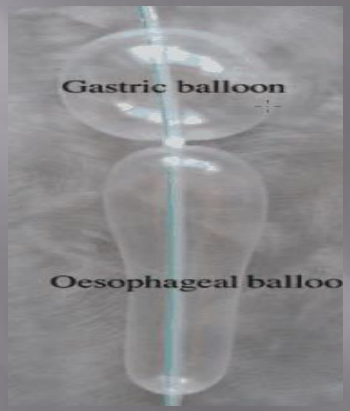
- Simple and practical
- Low cost: (Plastic)
- Accurate:
- Objective
- Can be used in a wide range of settings
- Provides a hygienic delivery surface

Stopping the Bleeding: Balloon Tamponade

- **A balloon (inflated with saline/water) exerts pressure to stop bleeding from within the uterus in 5-15 mins.**
- **Is very effective (≥85%) when uterotonics fail. Can prevent need for laparotomy and hysterectomy.**
  (Reported success rates for the control and management of PPH with uterine tamponade are quite high and range between 70-100%.)
- **Easy to use**
- **Can effectively be used in low resource settings**
- **Safer alternative to uterine packing**

Commercially Available Balloon Tamponades in Use

Bakri
$250 per device



Sengstaken–Blakemor
$220 for two devices

BT-CATH
$200 per device

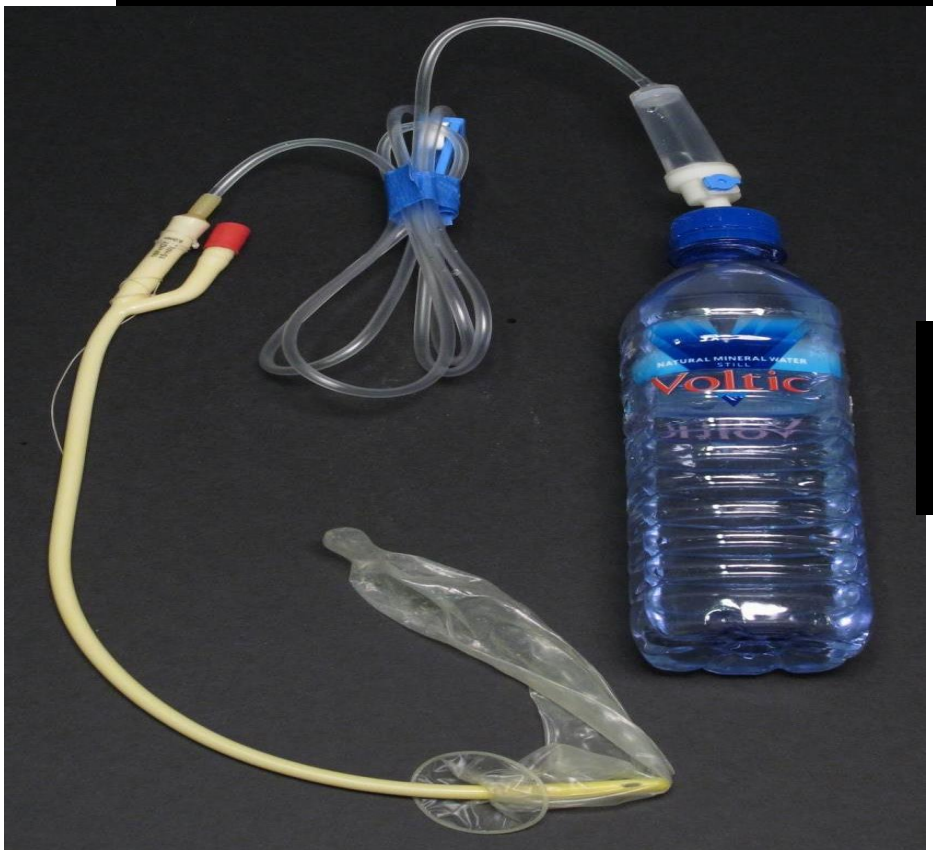
Rusch hydrostatic
$77 (quoted £50)

These commercially available devices are prohibitively expensive

Source: Georgiou C. Balloon tamponade in the management of postpartum haemorrhage: a review. BJOG 2009;116:748-757

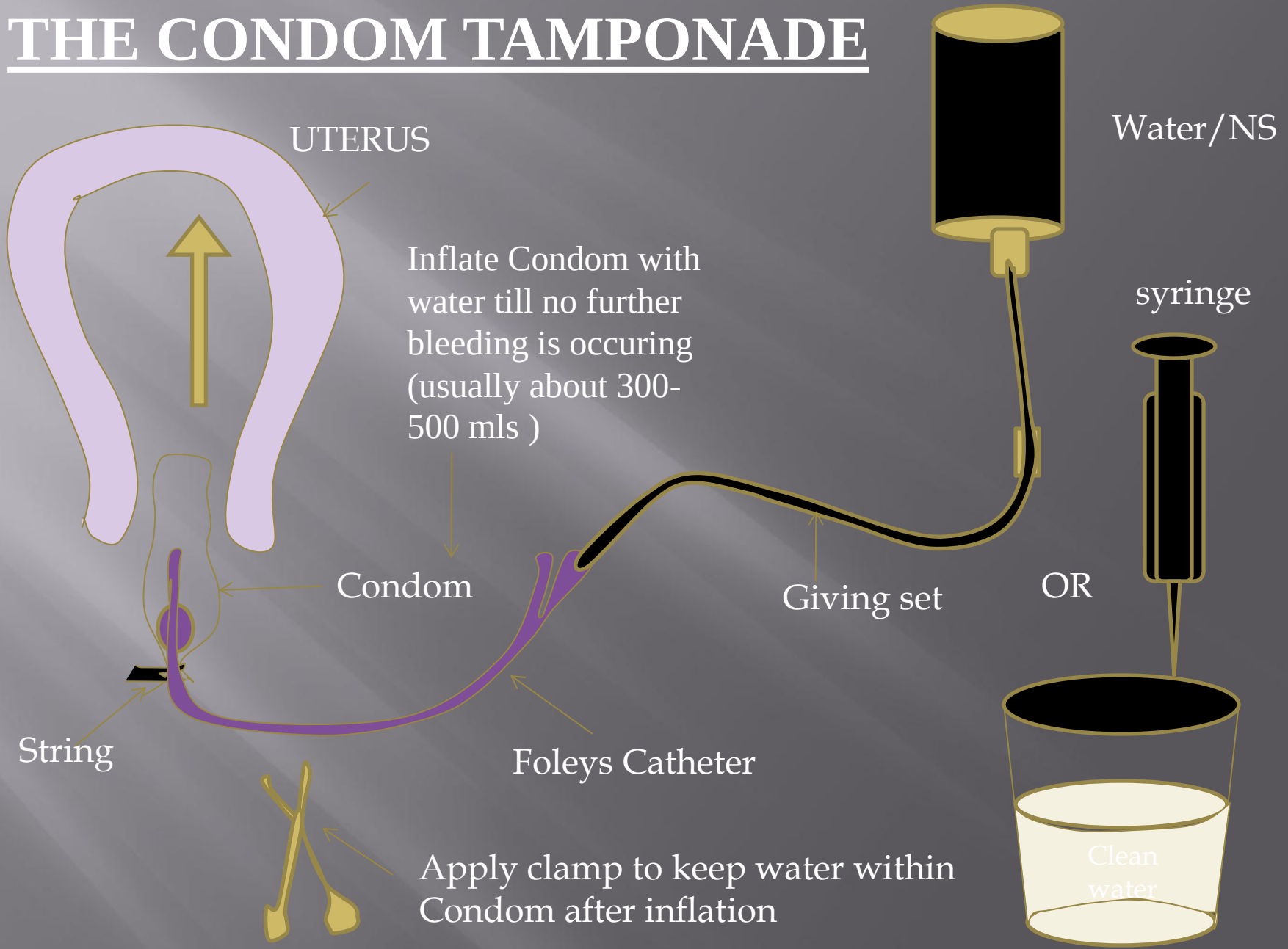
The Innovative Condom Tamponade Unit

A condom still saves lives even during Childbirth!

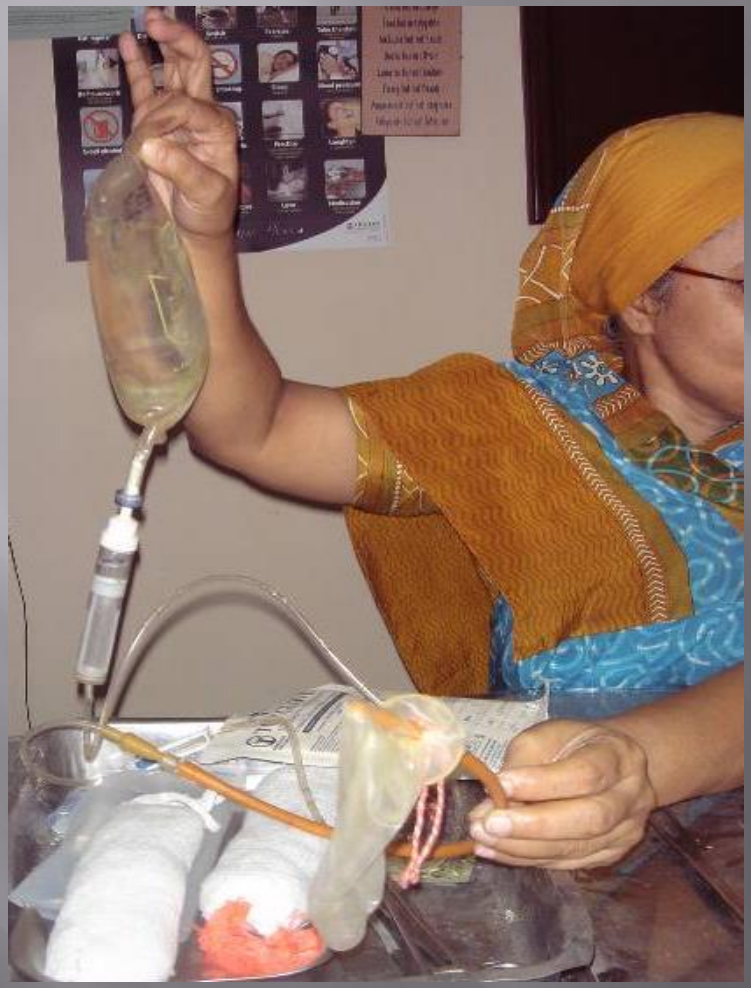


The Condom /Catheters Unit can be assembled in a few minutes and cost of components is ≤ U.S.$5

THE CONDOM TAMPONADE



The Condom Tamponade Emergency Pack



Contraindications To Use

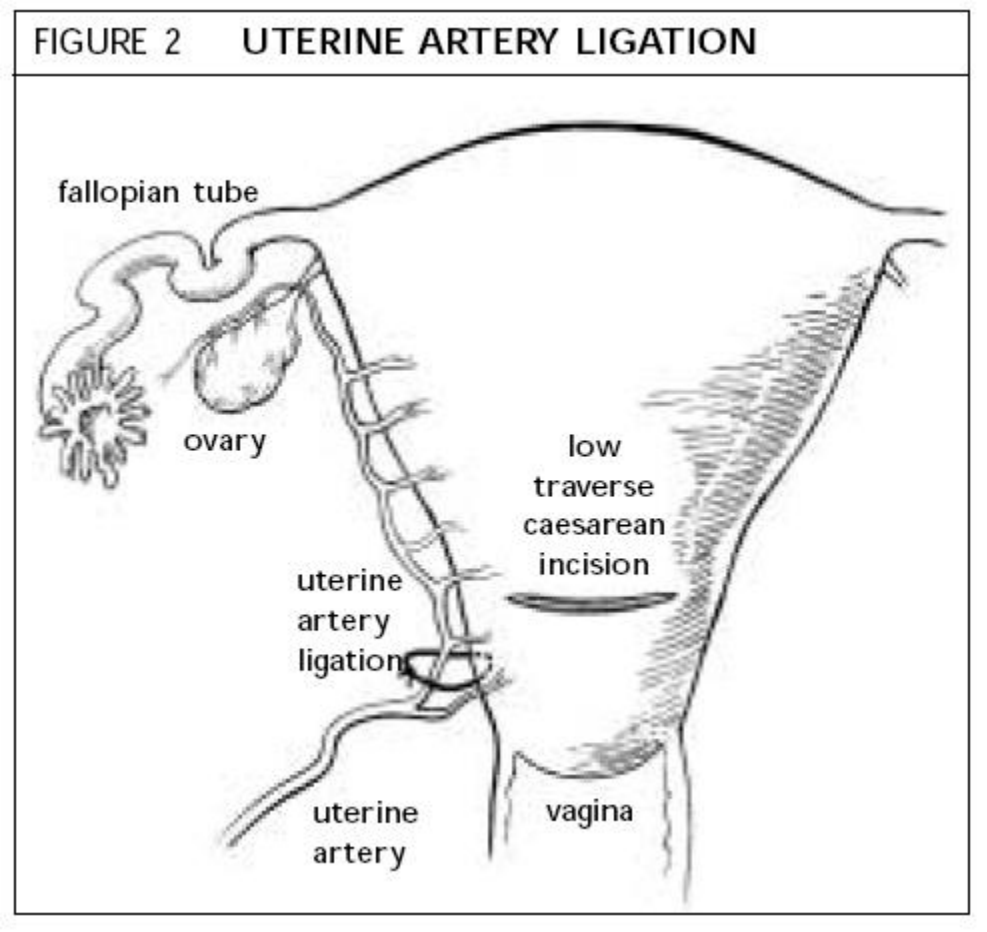
When should we not use the balloon?

- Arterial bleeding requiring exploration and ligation or angiographic embolization.
- Cases indicating hysterectomy.
- Where uterine rupture is suspected
- Cervical cancer.
- Disseminated Intravascular Coagulation (DIC) *.

Surgical Approach in PPH

- Uterine vessel ligation
- Internal iliac vessel ligation
- Hysterectomy
- Newer Techinques: compression sutures

Uterine artery ligation



New Intra-Operative Surgical Techniques

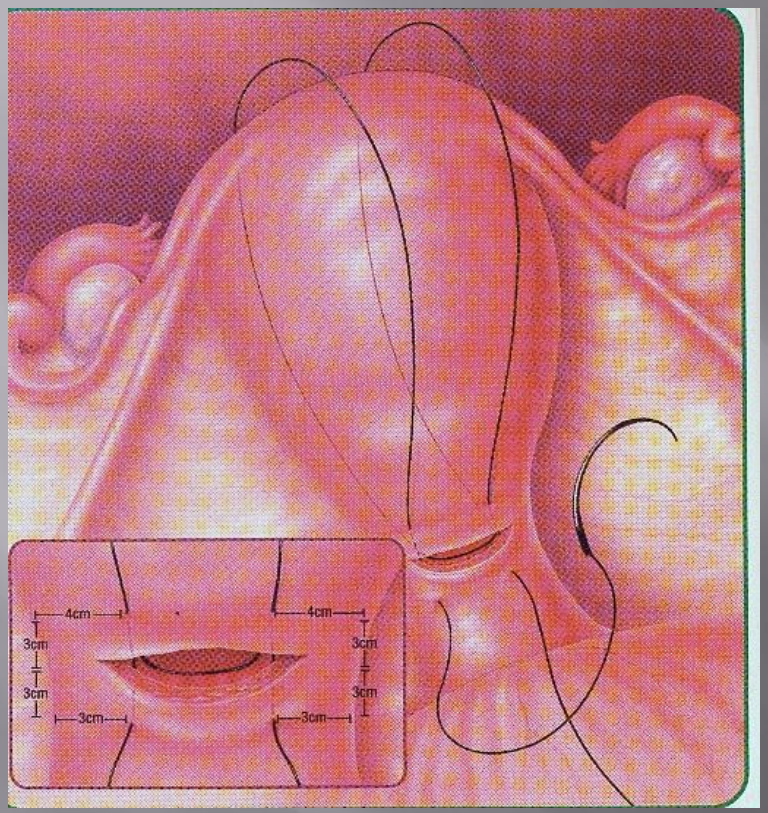
New intra-operative techniques :

They either act to produce tamponade by compressing the uterus and apposing its anterior and posterior walls or to effectively reduce blood flow to the uterus.

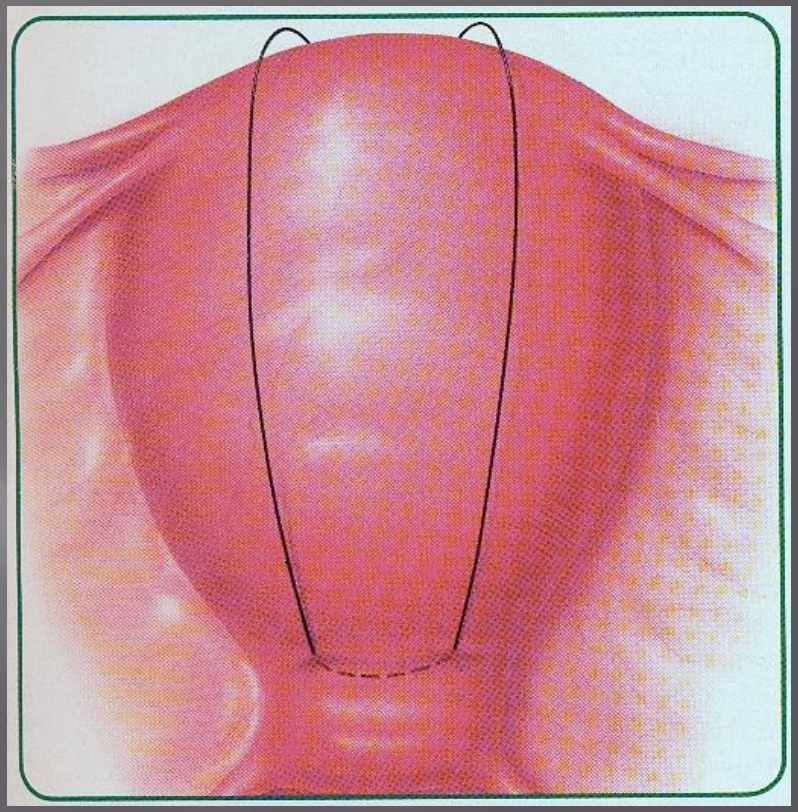
These techniques include:

- **Uterine Compression sutures :e.g.**
  - B-Lynch Brace Sutures
  - Cho Sutures
  - Square sutures
- **Arterial ligation/pelvic devascularization**
- **Selective Arterial embolization (Uterine Artery)**

The B-Lynch Suture



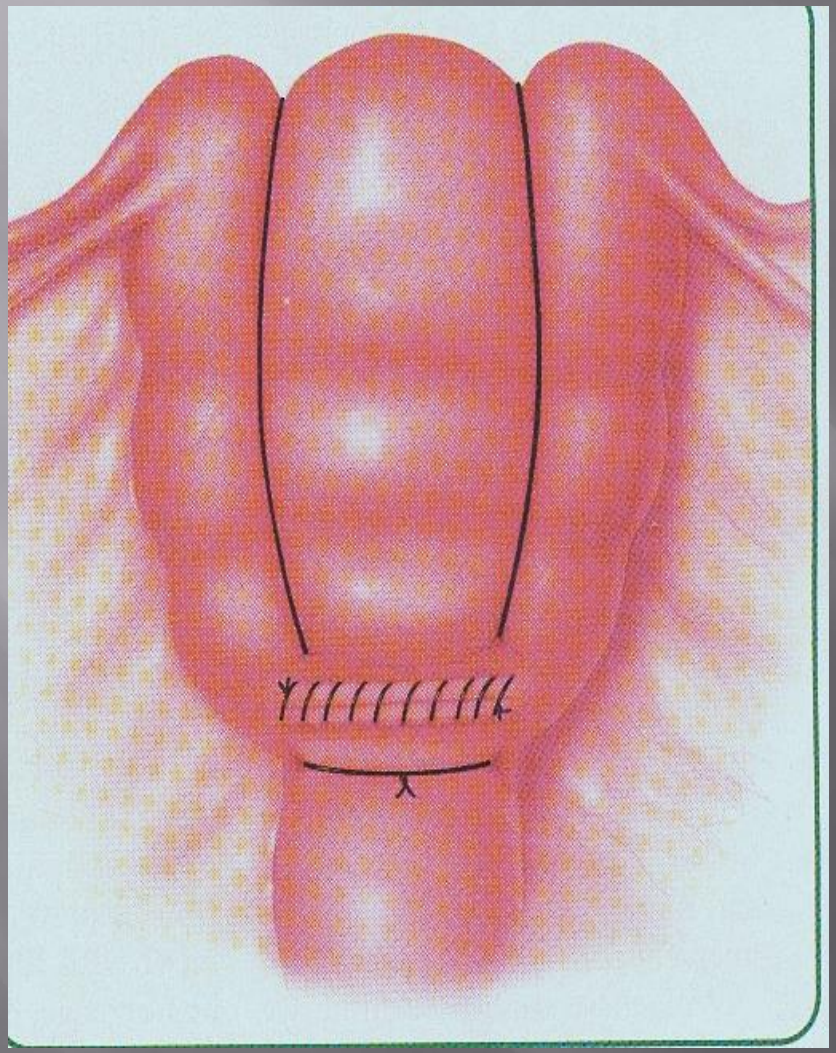
Step 1: Using Absorbale arge suture.
In-out-over…In-out-over…In-out-tie



B-Lynch Suture #2

Courtesy: Lynch BC, Coker A, Laval AH et al. The B_Lynch technique for control of Masive PPH, An Alternative to Hysterectomy. Five Cases Reported. Br. J. Obstet Gynecol 1997, 104 327-376

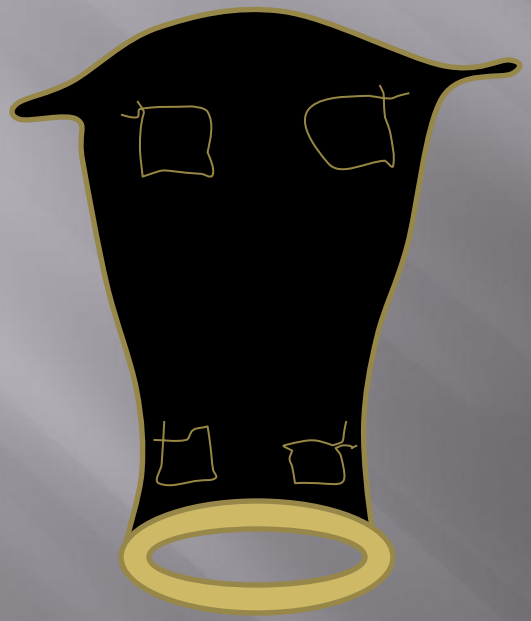
B-Lynch Suture #3



Modifications of this procedure are also available:
Example Suture is "fixed" by taking bites through Myometrium at the fundus

UTERINE COMPRESSION SUTURES

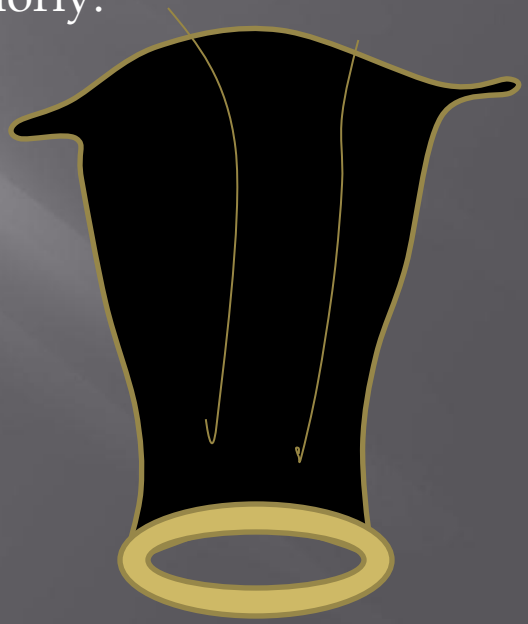
- SQUARE



Multiple square sutures are
Passed intramurally and tied
at
Various points.

VERTICAL

A Straight needle is passed anterior to posterior and passed over fundus and ligated anteriorly.



Cho JH, Jun HS, Lee CN: Haemostatic Suturing Technique For uterine Bleeding during Cesarean Section delivery. Obstet Gynecol 200 0 96:129-131

The Compression Sutures

Advantages :

- Preserves future fertility and menstrual function
- Simple and quick to perform

Disadvantages

- Uterine wall ischaemia /Necrosis

Selective Artery Embolisation

- Evolved from other angiograpic embolisation techniques (Since 30 Years)
- Gelatin Sponges are injected into the bleeding vessel until stasis of flow in target vessel is achieved. Acess is gained via femorals to internal iliac and subsequently the uterine arteries

Selective Artery Embolisation

Advantages

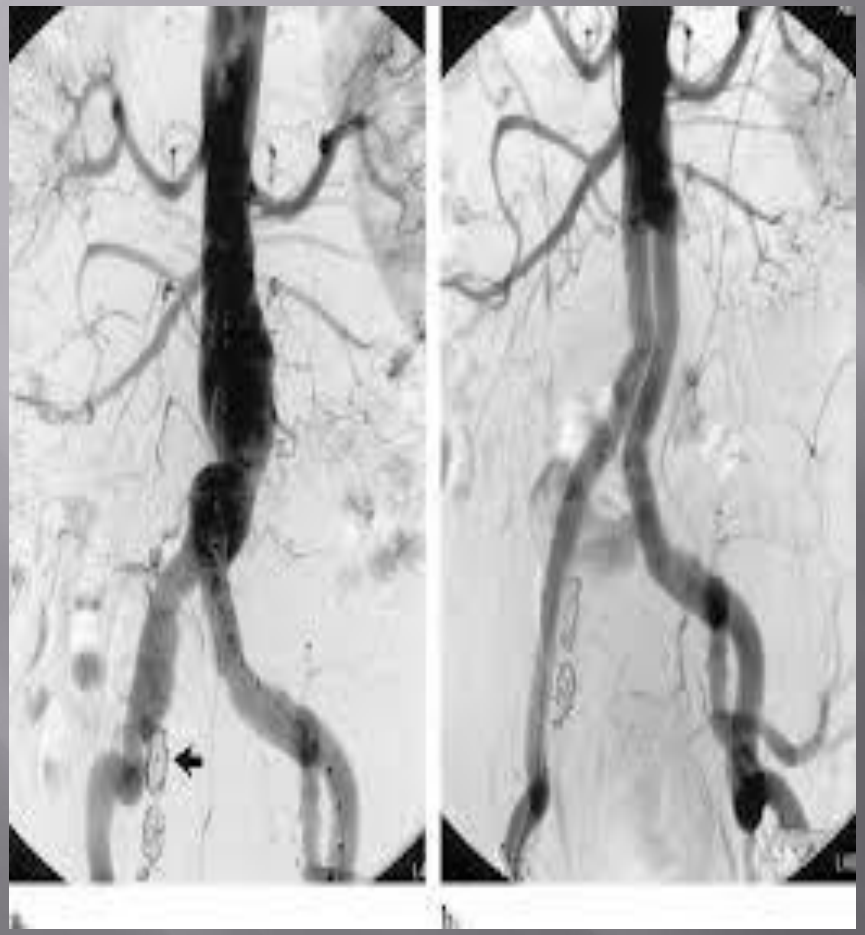
Preserves Fertility

Useful in Haemorrhage associated with Placenta praevia

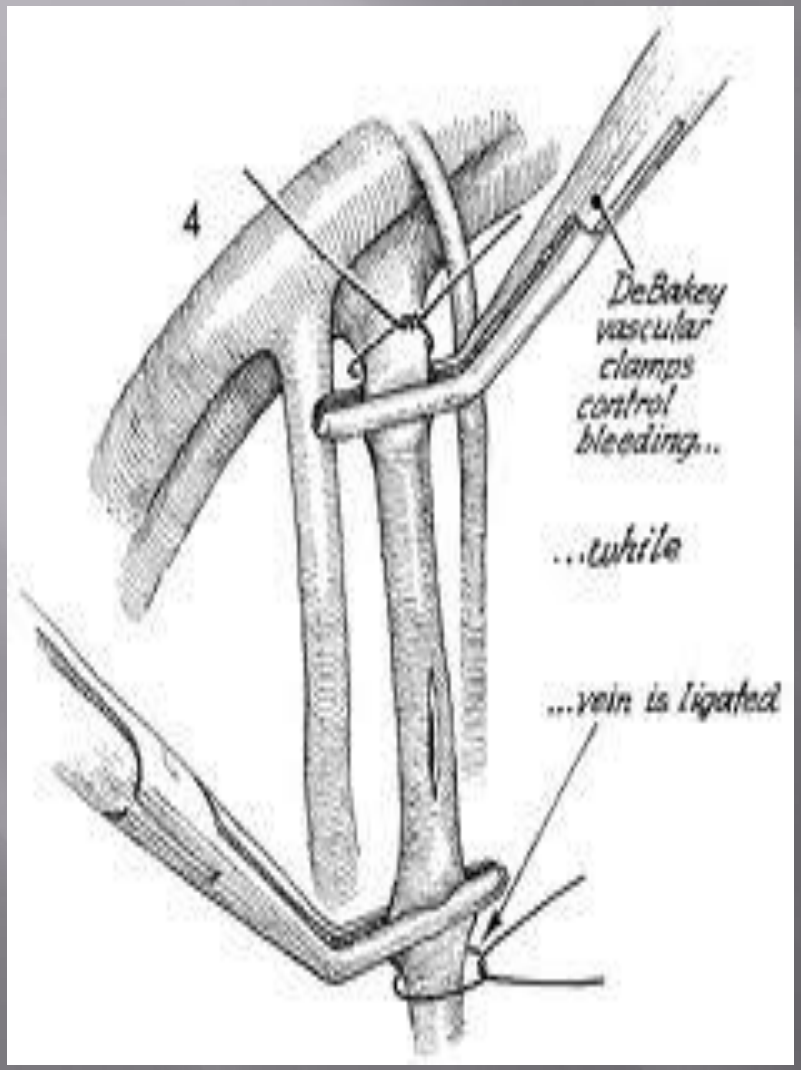
Disadvantages

- Requires 24hr availability of radiological expertise.
- Patients must be stable
- Complications include: Necrosis of uterine wall, contrast adverse effects, local haematoma formation

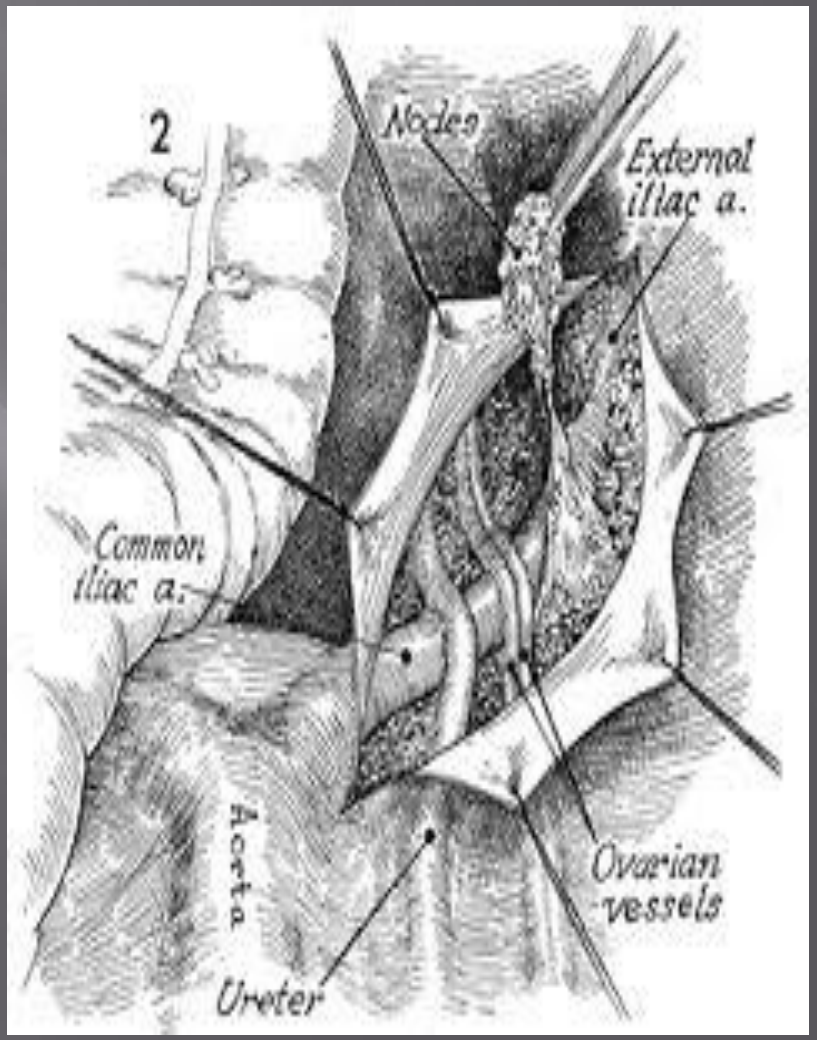
UTERINE ARTERY EMBOLISATION



INTERNAL ILIAC ARTERY



LIGATION



ANATOMY

Success rates of the new Technological measures in the management of PPH

Method	Number of Cases	Success Rates (%)	95% CI (%)
B-Lynch/compression sutures	108	91.7	84.9–95.5
Arterial embolization	193	90.7	85.7–94.0
Arterial ligation/pelvic devascularization	501	84.6	81.2–87.5
Uterine balloon tamponade	162	84.0	77.5–88.8

There was no statistically significant difference between the four groups (P = 0.06).

Non-Pneumatic Anti-Shock Garment (NASG)

- **NASG is a simple device that counteracts shock and decreases blood loss by applying direct counter pressure to the lower parts of the body.**
- Developed by NASA 20+ yrs ago
- Useful as a first aid tool that

  Keeps woman alive during prolonged transportation to reach help (CEOC).

UPDATED STEPS IN THE MANAGEMENT OF SEVERE PPH

PREVENTION AMTSL

UTERINE MASSAGE / MORE OXYTOCICS

Establish Cause

TEARS

RETAINED PLACENTA

ATONY (90%)

COAGULOPATHY

BIMANUAL COMPRESSION / AORTIC COMPRESSION / ANTI-SHOCK GARMENT

HYDROSTATIC CONDOM TAMPONADE

SURGERY

COMPRESSION SUTURING; B-LYNCH PROCEDURE

LIGATION OF UTERINE & OVARIAN ARTERIES

…questions?

Image courtesy of defeatpoverty.com

THANK YOU