Postpartrum Care and Complications

Dr Yun Feng

Women's Hospital
Zhejiang University School of Medicine

Postpartum period (puerperium)

the first 6 weeks after delivery

1. Immediate puerperium: <24 hours
2. Early puerperium: <1 week
3. Remote puerperium: <6 weeks

Concerns	Percent
Need for social support	32
Breast-feeding issues	24
Inadequate education about newborn care	21
Help with postpartum depression	10
Perceived need for extended hospital stay	8
Need for maternal insurance coverage postpartum	6

[a]Centers for Disease Control and Prevention, 2012b.

Physiological changes in puerperium

- Involution: the shrinkage of an organ when inactive, e.g. the womb after childbirth.
- Uterus: from 1000-1200g to 50-100g in 4 weeks;
  - the fundus is above umbilicus on the 1st day, and decreases 1-2cm every day;
  - impalpable abdominally after 10 days;
  - Afterpains: painful contractions within 3-4 days after birth, especially for multipara.

- Lochia: physiological postpartum uterine discharge (blood and shredded decidua);
- 4-6 weeks:
  - Lochia rubra: reddish (3-4 days)
  - Lochia serosa: serous and brownish (10 days)
  - Lochia alba: whitish (3 weeks)
- Subinvolution: long-lasting lochia with foul smell (infection or retained placental fragments)

- Cervix: cervical canal is formed by the end of 1st week, and involuted by the 4th week.
- Vagina: diminishes in size and caliber; vaginal mucosal folds reappear after 3 weeks; rarely regain its nulliparous dimensions .
- Perineum: perineal edema subsides in 2-3 days and lacerations heal in 4-5 days.
- Abdominal wall: midline of abdomen becomes depigmented; striae gravidarum become lighter in color to striae albicans.

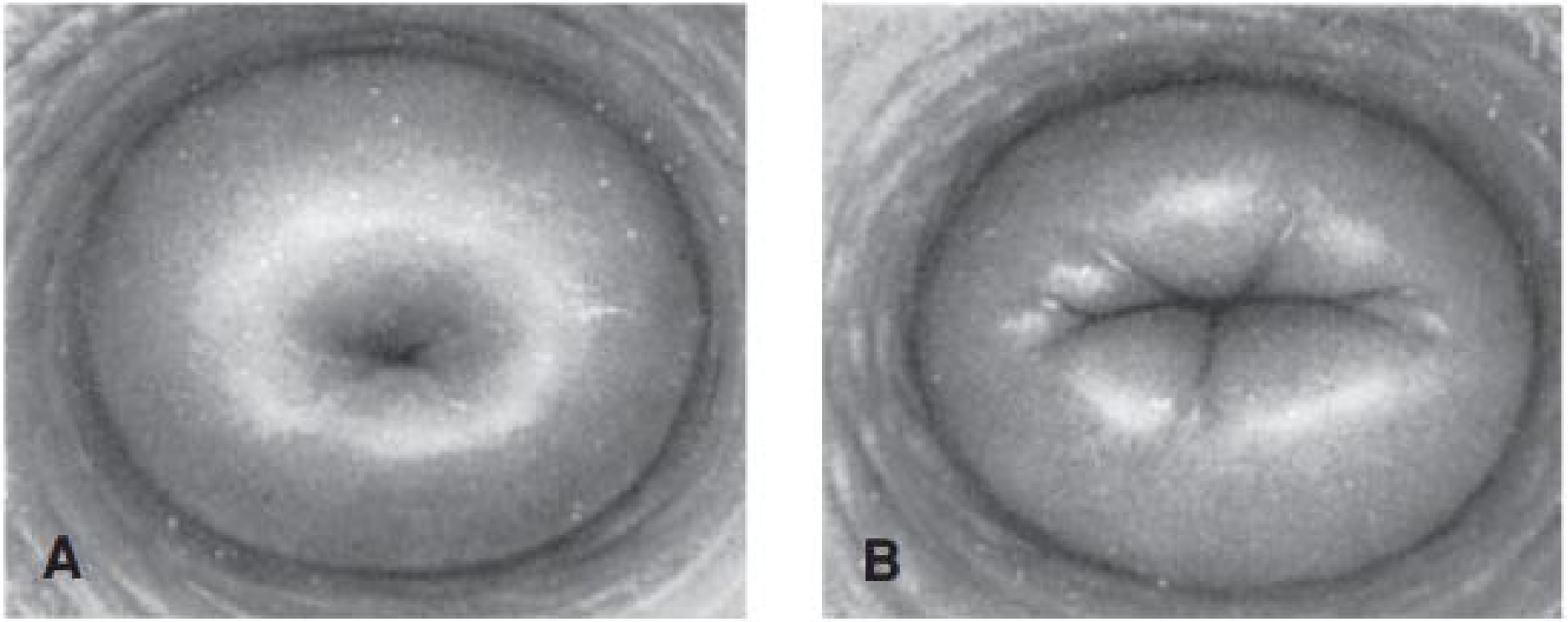
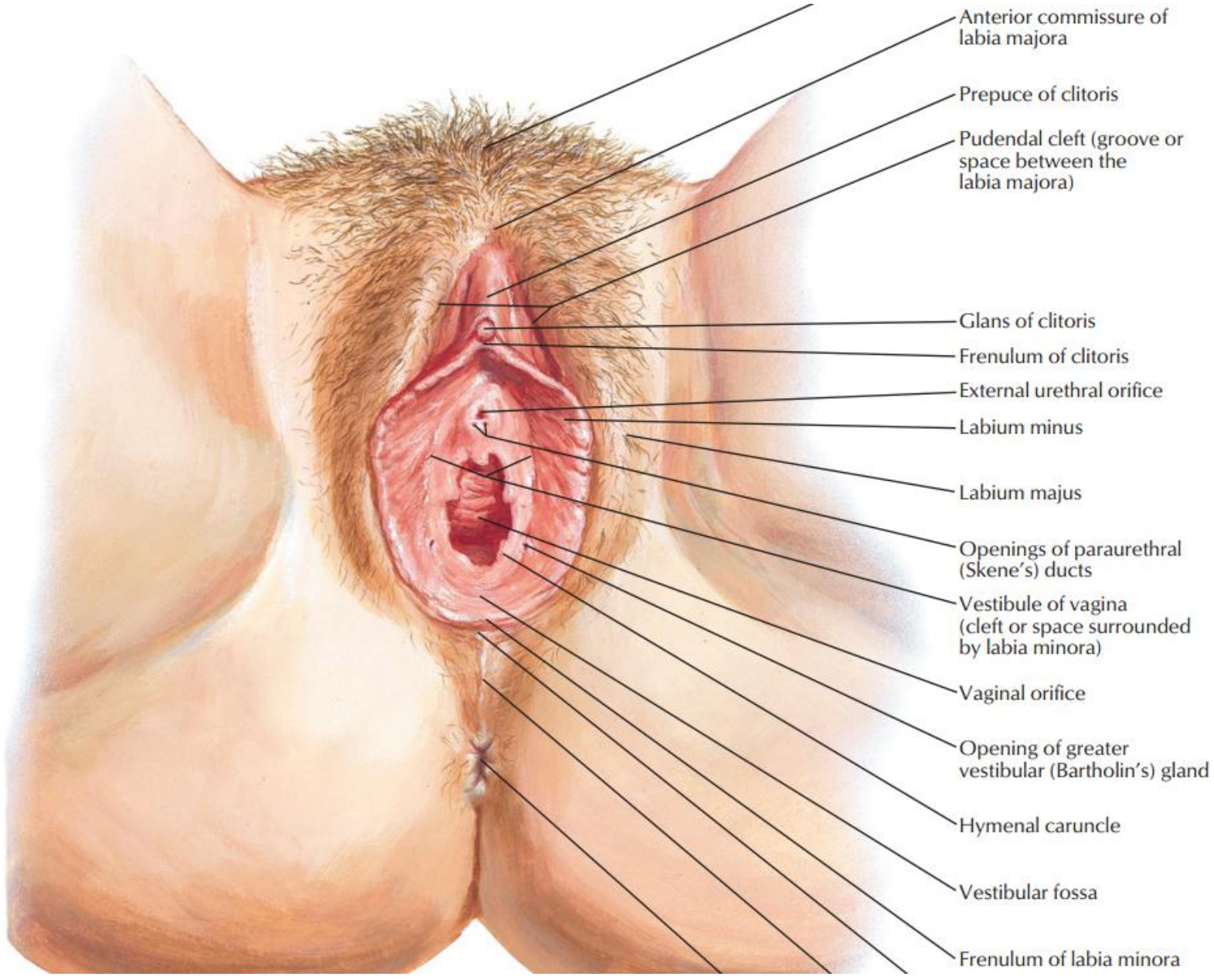
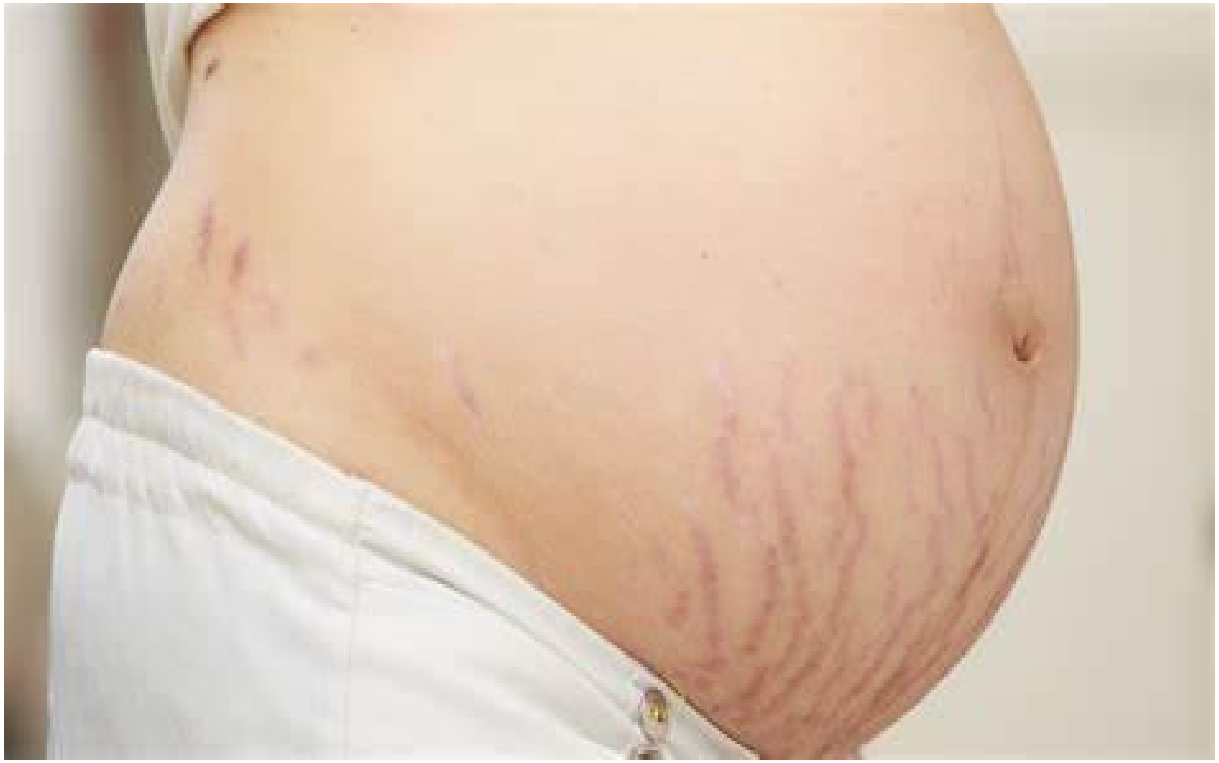


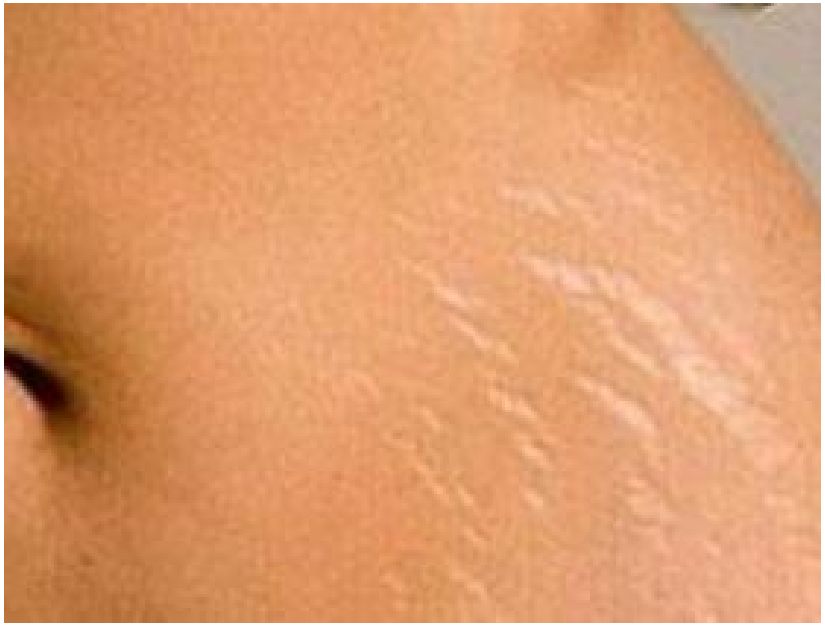
FIGURE 36-1 Common appearance of nulliparous **(A)** and parous **(B)** cervices.

myrtiform caruncles





striae gravidarum



striae albicans

- Cardiovascular system: blood volume increases 15%-25% within 72h, and returns to normal in 2-3 weeks.
- Digestive system: constipation; bowel function returns in 1-2 weeks.
- Urinary tract: the bladder has an increased capacity and a relative insensitivity to intravesical pressure. Thus, overdistention, incomplete emptying, and excessive residual urine are common.
- Excessive perspiration.

- Endocrine system:
  - estrogen and progestogen drop to prepregnant level in 1 week and remain low in lactating women;
  - prolactin normalizes by 2-3 weeks in nonlactating women.
- Ovulation:
  - Nonlactating women ragain menstruation in 6-10 weeks, and ovulate in 10 weeks;
  - Lactating women take 4-6 months before ovulation on average.

Breast and lactation

- The abrupt decrease in the levels of progesterone and estrogen removes the inhibitory influence on α-lactalbumin production and stimulates lactose synthase.
- The intensity and duration of lactation are controlled by the repetitive stimulus of nursing and emptying of milk from the breast.
- Each act of suckling triggers a rise of plasma prolactin levels in levels.
- Oxytocin stimulates milk expression by causing contraction of myoepithelial cells in the alveoli and small milk ducts.
- Milk ejection, or *letting down*, is a reflex initiated especially by suckling.

- After delivery, the breasts begin to secrete *colostrum*, which usually can be expressed from the nipples by the second postpartum day.
- Colostrum is rich in immunological components (immunoglobulin A) and contains more protein, minerals and amino acids, but less sugar and fat.
- Secretion persists for 5 days to 2 weeks, with gradual conversion to mature milk by 4 to 6 weeks.

Colostrum and Transitional Milk

Improves immune function

Promotes gut maturation

Colostrum	Transitional Milk	Mature Milk
Pre-milk fluid		
Rich in immunoglobulins and immune cells, growth factors	Higher levels of fat, protein , sodium , Cl, Ca^{++}, Zn, Cu, folate, lactose, and vitamins compared to term milk	Less concentrated, lower nutrient density maintained throughout the first postpartum year
First 24 – 48 hours postpartum Day 1 6 – 10 mL/kg/d	3^{rd} – 14^{th} day postpartum	2 weeks postpartum

Routine postpartum care

VAGINAL DELIVERY:

- The first two hours:
  - Size and contractility of uterus
  - Vaginal bleeding
- Pain control and perineal care
  - pain can be reduced with nonsteroidal anti-inflammatory drugs (NSAIDs) or acetaminophen (paracetamol)
  - For patients with either episiotomies or lacerations, excessive perineal pain or feeling of defecation may indicate hematoma.

- Bladder: void within 4 hours; over distention of bladder within 24h due to difficult labor, reduced sensation and pain.
- Bowel: mild laxative;
- Breastfeeding: should be encouraged;
- Follow-up visit: in 4-6 weeks.

- CESAREAN DELIVERY:
  - wound care and pain management, as well as normal post-operation care;
  - Early ambulation;
  - Prevention of thrombosis.

POSTPARTUM CONTRACEPTION

- It usually takes 6 weeks postpartum before sexual activity resumes.
- Exclusive breastfeeding is a natural way of contraception (<2% risk).
- Appropriate contraception:
  - Progestin only pill (POP);
  - Depot medroxyprogesterone acetate (DMPA);
  - IUD
  - Barrier methods

Postpartum complications

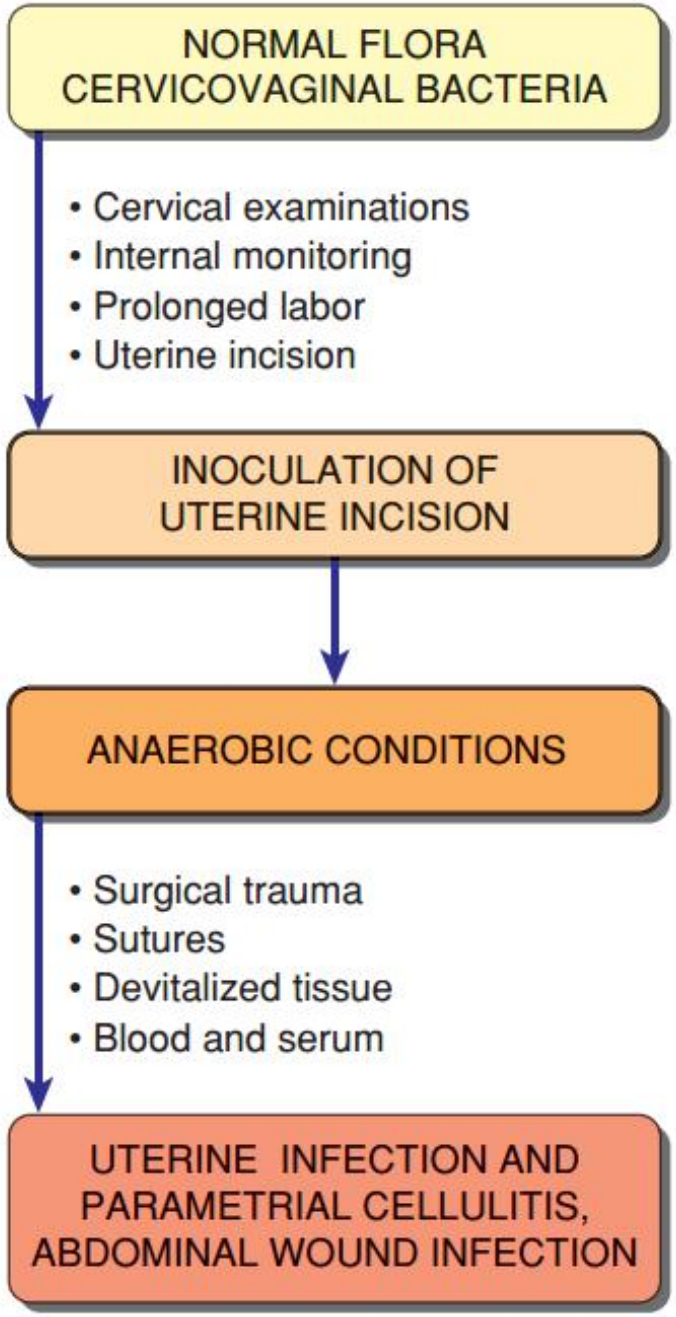
Puerperal fever
Postpartum depression
Postpartum hemorrage (PPH)

Puerperal fever

- Definition: A temperature above 38°C on any 2 of the first days postpartum excluding the first 24hrs.
- Morbidity rate 2%-8%.
- Causes:
  - Endometritis
  - Mastitis
  - Wound infection
  - Other infections
  - breast engorgement

Endometritis

- Risk factors:
  1. Antenatal intrapartum infection
  2. Cesarean section
  3. Prolonged rupture of membranes
  4. Prolonged labor
  5. Instrumental delivery
  6. Retained product of conception



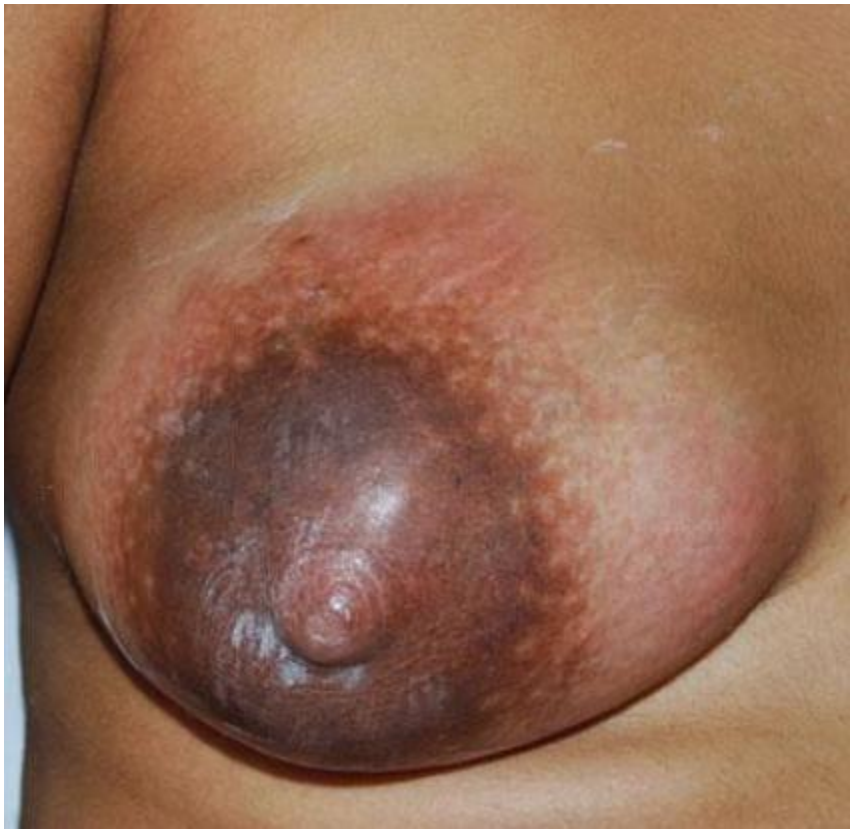
- Symptoms:
  - fever,
  - lower abdominal pain,
  - offensive lochia,
  - secondary postpartum hemorrhage;
- Signs:
  - pyrexia and tachycardia
  - uterine or adnexal tenderness

- Common pathogen:
  - Aerobes: hemolytic streptococcus, staphylococcus epidemics (G+), E. coli (G -)
  - Anaerobes: peptococcus, peptostreptococcus, bacteroides
  - Chlamydia and mycoplasma
- Treatment: IV antibiotics
- Perioperative Prophylaxis:

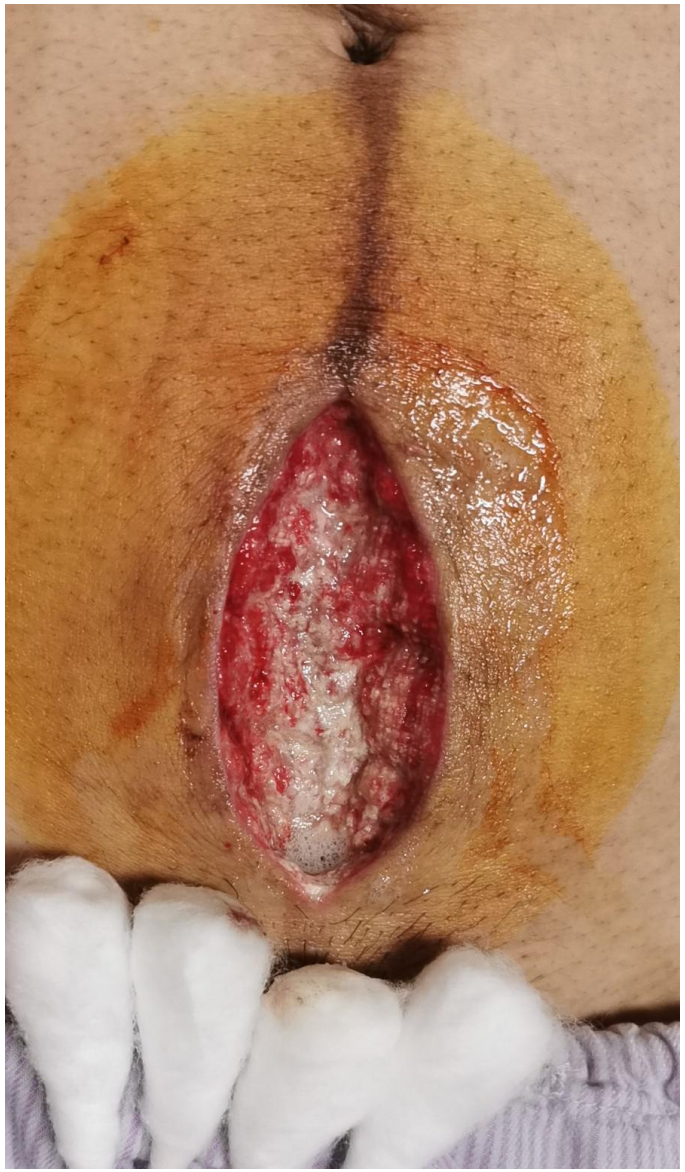
  Single-dose broadspectrum agents (ampicillin or a frst-generation cephalosporin)

Mastitis

- An indurated reddened painful area complicated with fever and chills
- Staphylococcus aureus
- Breast abscess requires drainage
- “Breast fever” rarely exceeds 39°C in the first few postpartum days and usually lasts < 24 hours.



Wound infection



--debridement

Postpartum depression

- Postpartum blues:
  - 30%-70% incidence;
  - mild and transient;
  - Tearfulness and anxiety;
  - within the first week.
- Postpartum depression:
  - 8%-15% incidence
  - High recurrence rate
  - Lost of interest in all activities
  - Serotonin reuptake inhibitor

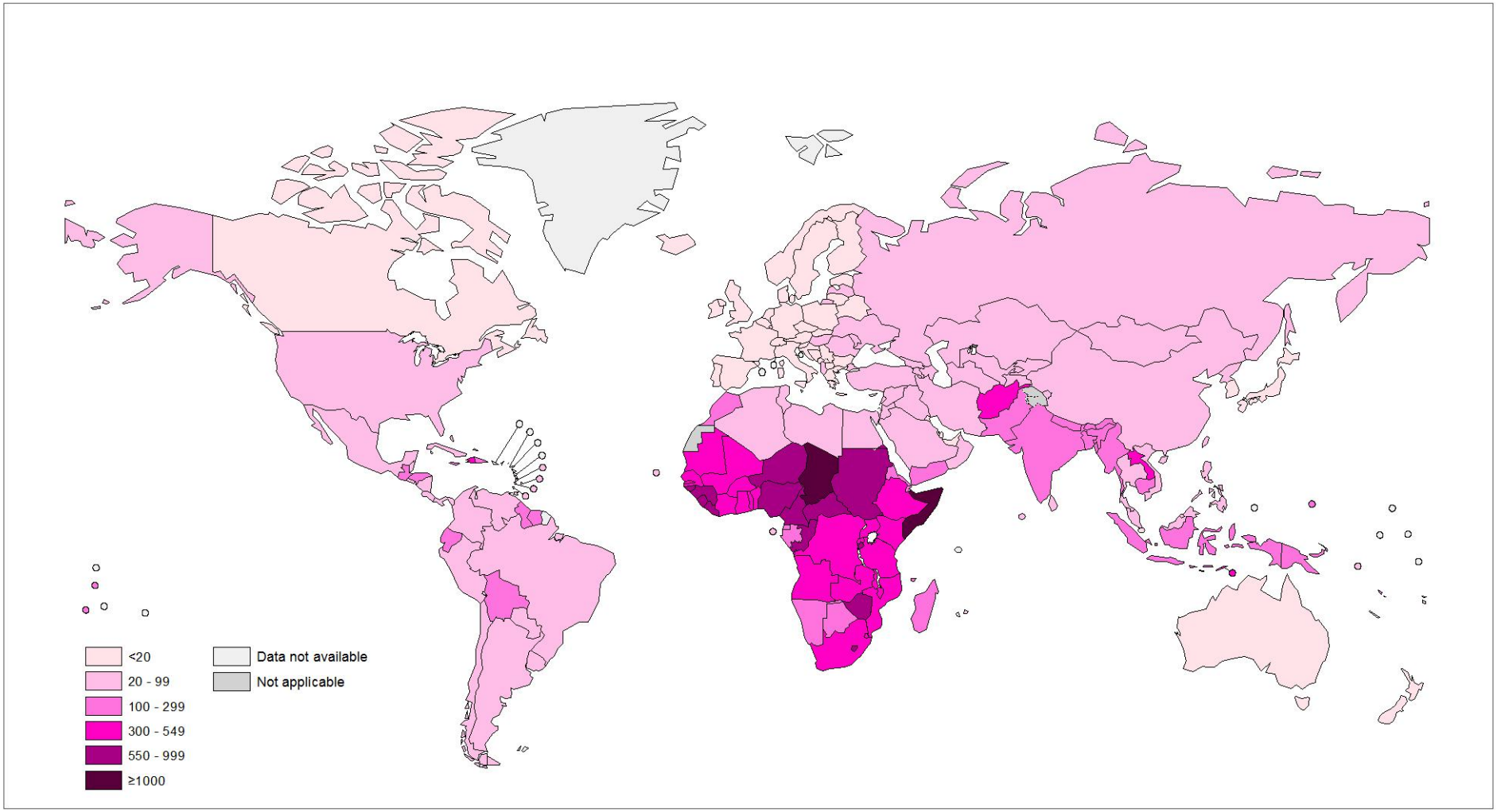
A case

A healthy 42 year old G6 Ab1 has just had a spontaneous delivery of her 5th child, a 4200G male following a labor lasting 1.5hrs. Delivery of the baby was followed almost immediately by the passage of the placenta. As the baby was being passed off to its mother. There was a large gush of blood from the vagina, and the mother felt faint and began vomiting.

What is going on?

What immediate steps would you take to help?

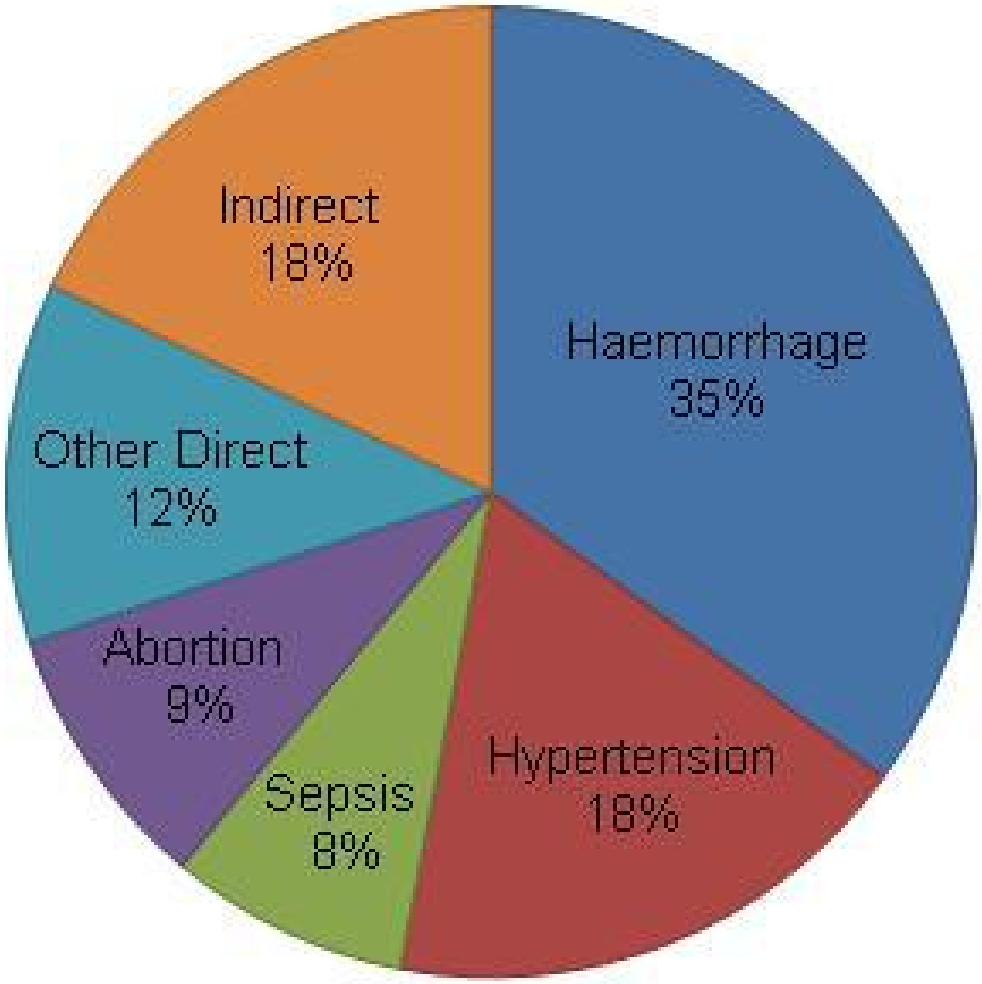
Maternal mortality ratio (per 100 000 live births), 2010



Data Source: World Health Organization
Map Production: Public Health Information and Geographic Information Systems (GIS)
World Health Organization

World Health Organization

Direct Causes of Maternal Mortality



Source: Countdown to 2015 Decade Report (2000-2010), World Health Organization (2010)

Postpartum hemorrhage(PPH)

Definition

Mode of delivery	blood loss
Vaginal delivery	greater than 500ml
Caesarean delivery	greater than 1000ml

Time of onset of bleeding

Within 24 hours: early or primary PPH

After 24 hours: late or secondary PPH

Part I: Primary PPH

Causes of postpartum hemorrhage (4"T")

1. Abnormal (absent) uterine -"Tone"
2. Retained products of conception - "Tissue"
3. Genital tract -"Trauma"
4. Abnormal coagulation -"Thrombin"

1T : TONE (uterine atony)

- Uterine over distension:
  mutiple gestation, hydramnios, macrosomic fetus
- Uterine exhaustion:
  rapid or long labour, multiparity, oxytocin or prostaglandin stimulation,
- Uterine relaxants:
  nifedipine, magnesium, nitric oxide donors

TONE (uterine atony)

- Infection:
  fever, prolonged ROM
- Anatomic / functional distortion:
  fibroids, anomaly, placenta praevia, uteroplacental apoplexy
- Uterine inversion:
  fundal implantation of the placenta, uterine atony, placenta accreta, excessive traction on the cord during the third stage

Retained products of conception – 2T "Tissue"

- Abnormal placenta:

  Parity, previous uterine surgery, uterine anomalies, placenta previa (accreta, increta, percreta)

- Retained products:

  Incomplete placenta on inspection, retained clots, placenta retained in cavity, placenta succenturiata

3T: Trauma

- Vagina lacerations and hematomas
- Cervical lacerations

  Risk factors: Episiotomy, precipitate delivery, surgical delivery
- Uterine rupture

  Previous uterine surgery, breech extraction, obstructed labor, high parity

4T: Thrombin

- Acquired:
  thrombocytopenia in HELLP syndrome, DIC in intrauterine fetal death, septicemia, placenta abruptio, amniotic fluid embolism.
- Hereditary:
  Hemophilia, Von Willebrand's disease
- Anticoagulant therapy:
  valve replacement, APS

Clinical Presentation

- Different causes lead to different signs:
  - Tone: dark red, intermittently
  - Trauma: bright red, continuously
  - Tissue: dark red, delayed, continuously
  - Thrombin: bright red, no clots
- Concealed bleeding in the uterine/abdominal cavity;
- Importance of ongoing assessment:
  pulse, bp, vaginal bleeding, fundal height

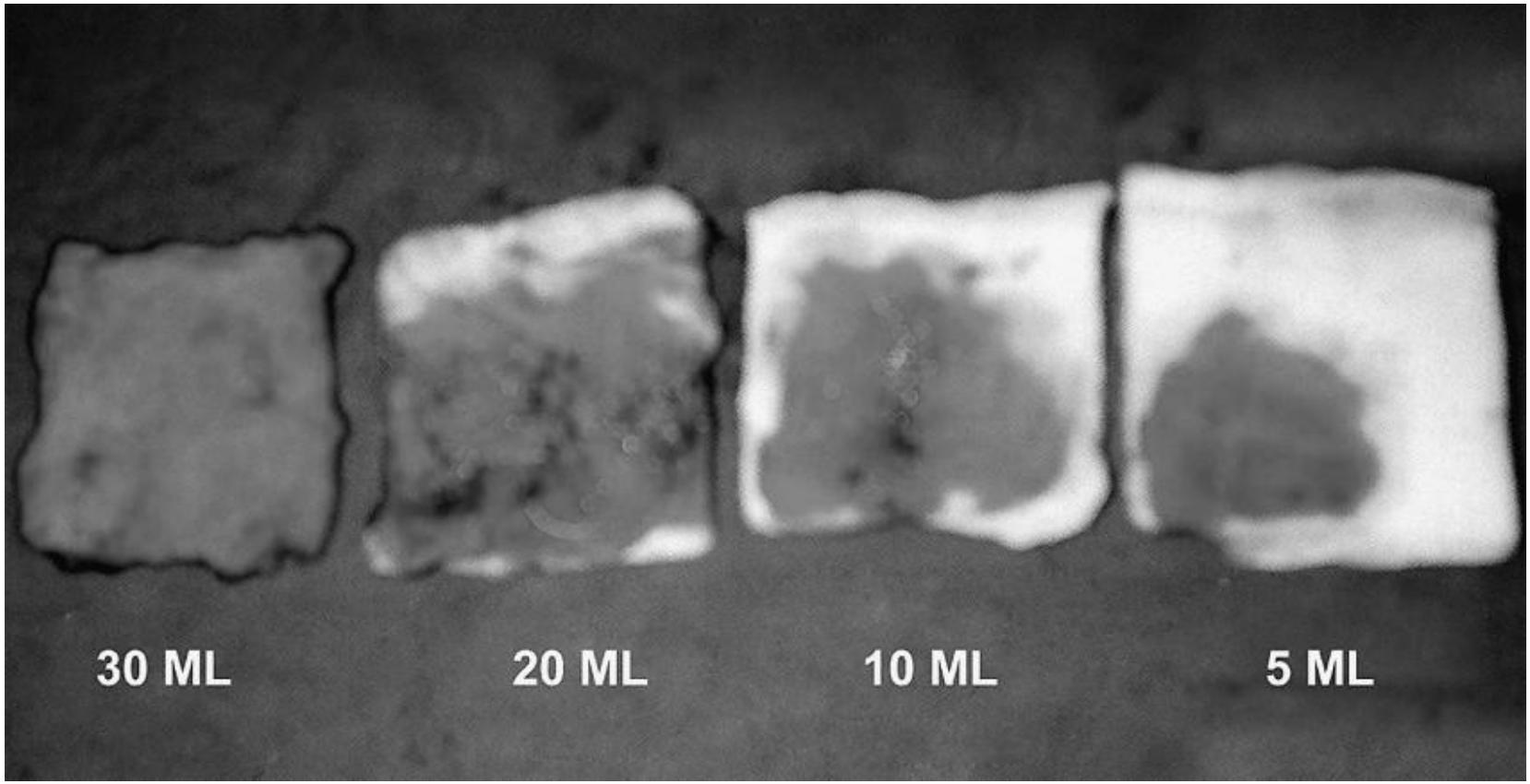
Symptoms related to blood loss with postpartum hemorrhage

Blood loss		Blood pressure	Signs and symptoms
%	ml	(mmHg)	
10-15	500-1000	normal	palpitations, dizziness, tachycardia
15-25	1000-1500	slightly low	weakness, sweating, tachycardia
25-35	1500-2000	70-80	restlessness, pallor, oliguria
35-45	2000-3000	50-70	collapse, air hunger, anuria

Measurement of blood loss during PPH

- Direct measurement of blood in the collecting container
- Gravimetric measurement of gauze and sponges (weighed before and after use)
- Evaluate the size of saturated sanitary pads (10cm*10cm is about 10ml)
- Shock index

Blood drained into a collecting container



Soaked pad of varied areas

Shock index

- Shock index =heart rate/systolic pressure (mmHg)
  (normal <0.5)

shock index	estimate loss of blood (ml)	loss of blood volume
0.6~0.9	<500~750	<20%
=1.0	1000~1500	20~30%
=1.5	1500~2500	30~50%
≥2.0	2500~3500	≥50~70%

Treatment of PPH :

Keys

Early recognition

SIMULTANEOUSLY: communication, resuscitation, monitoring and investigation, arresting the bleeding

Initial Assessment

Resuscitation	Investigations	Interventions
I/V infusion	Uterus ? tone ? tissue	Massage Removal of tissue
O2 by mask	Examine genital tract	Hemostatic suture, vessel ligation
Monitoring: bp, pulse, SatO	History, CBC, coagulation, cross match	Blood transfusion, coagulation factor supplement

During the 3rd stage of labour

- Active management of the third stage:
  early clamping of the umbilical cord and controlled traction for the delivery of the placenta.
- Prophylactic oxytocics should be offered routinely in the management of the third stage of labour:
  reduce the risk of PPH by about 60%.
- Rub the fundus to stimulate contractions

Procedures for Manual Removal of the Placenta and Membranes

Indications

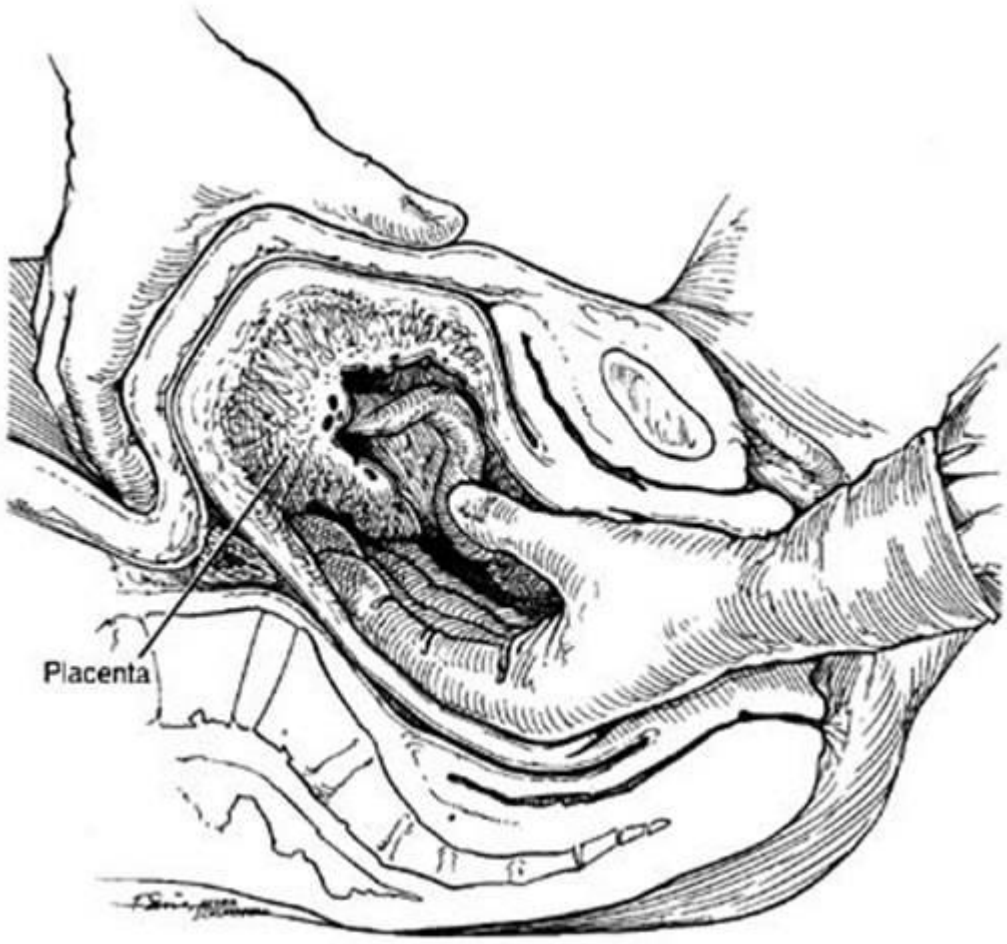
1.The sudden occurrence of hemorrhage but the placenta gives no indication of delivering

2.Hemorrhage after the delivery of the placenta AND examination of the placenta also shows evidence of missing placental fragments, membranes or a cotyledon.

Technique

1.Trace the umbilical cord with your hand to identify the edge of the placenta.

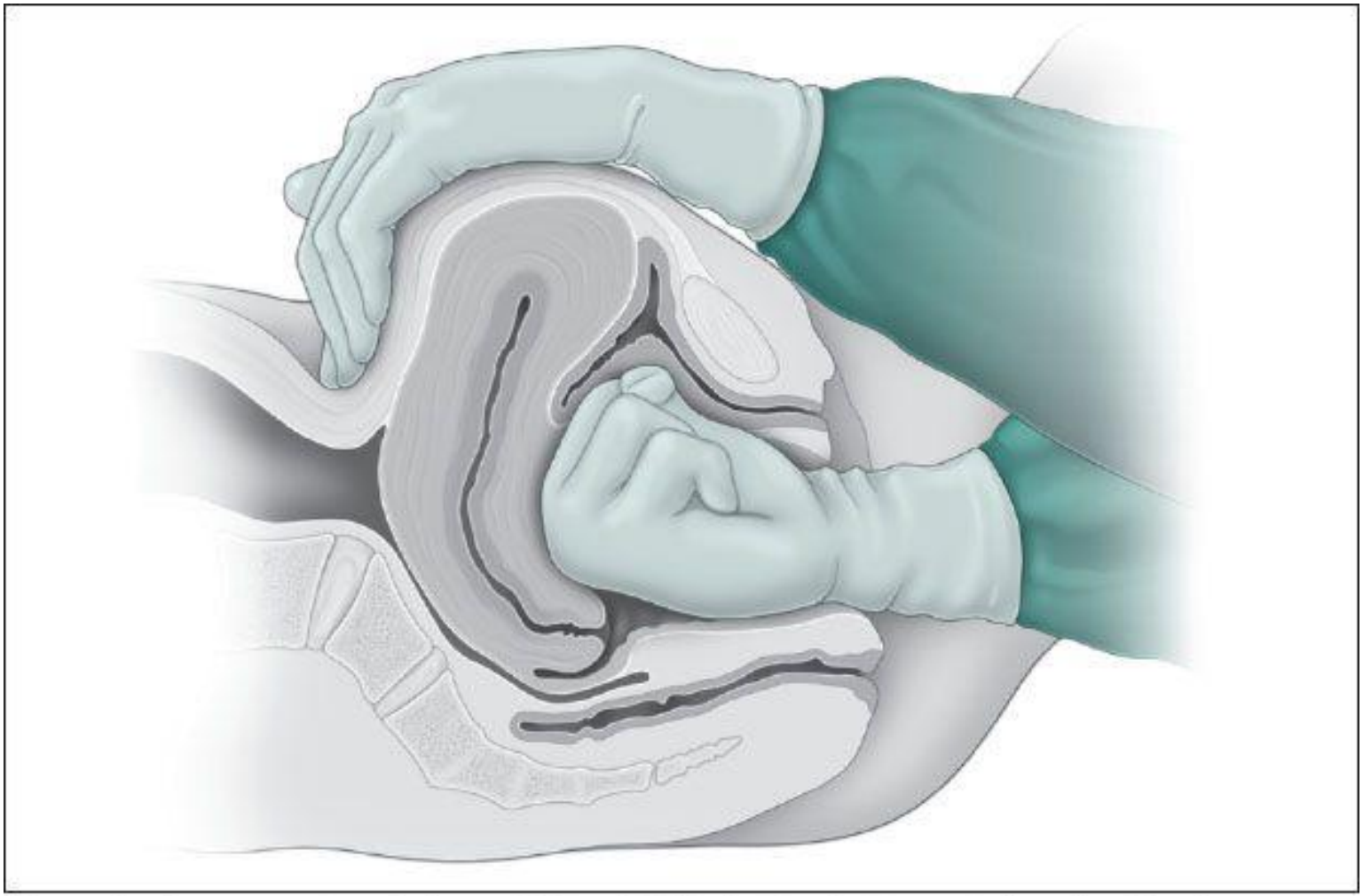
2.Insert the side of your hand between the placenta and the uterine wall. Then sweep behind the placenta and separate it from the wall of the uterus.



Management after placental delivery

- Bimanual uterine compression
  Syntocinon 5 units by IV
  Ergometrine 0.5 mg by IV or IM (contraindicated in women with hypertension).
  Syntocinon infusion (40 units in 500 ml Hartmann's solution at 125 ml/hour).
  Carboprost 0.25 mg by IM repeated at intervals of not less than 15 minutes to a maximum of 8 doses (contraindicated in women with asthma).
  Direct intramyometrial injection of carboprost 0.5 mg.
  Misoprostol 1000 micrograms rectally.

Bimanual uterine compression

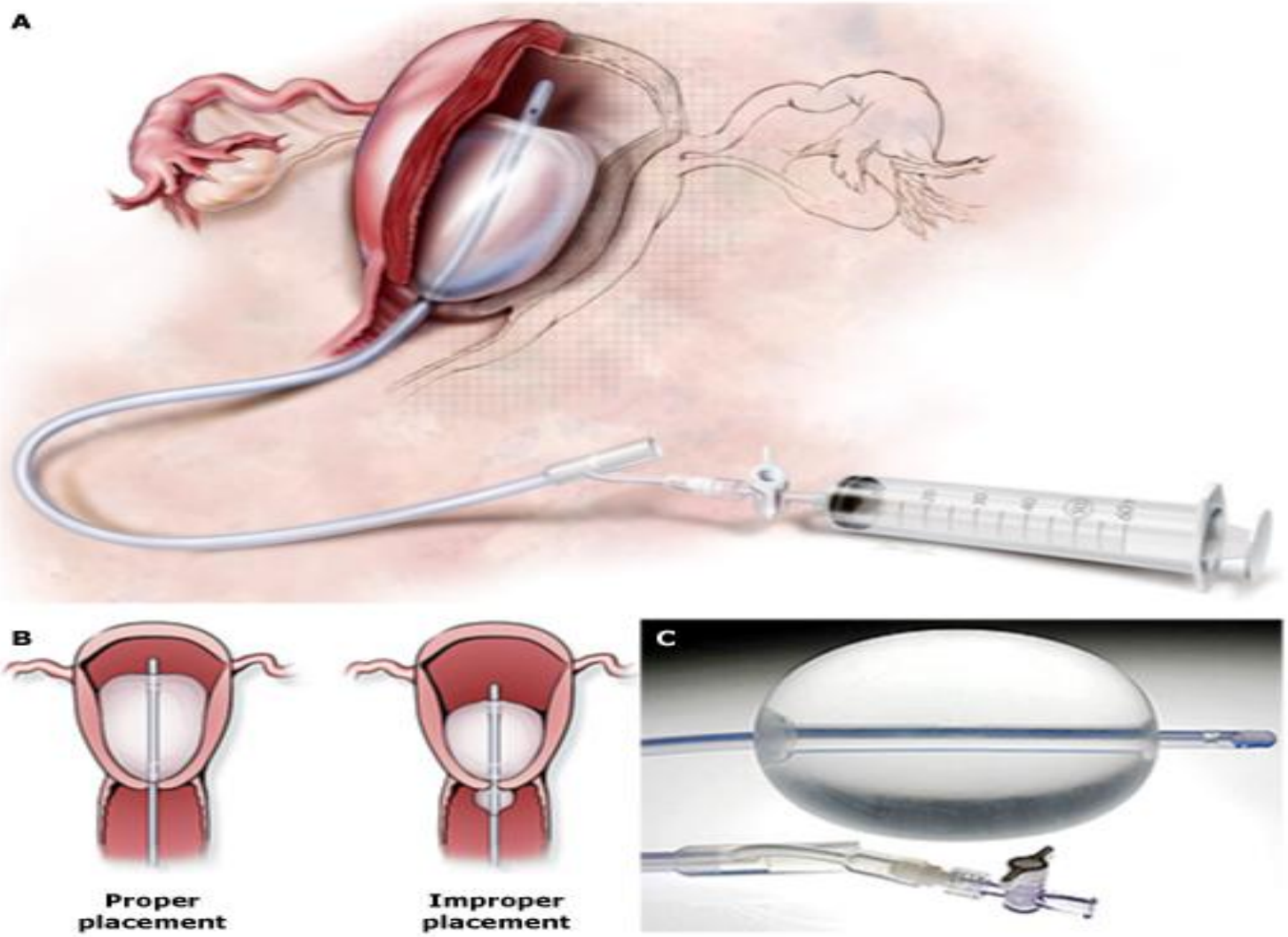


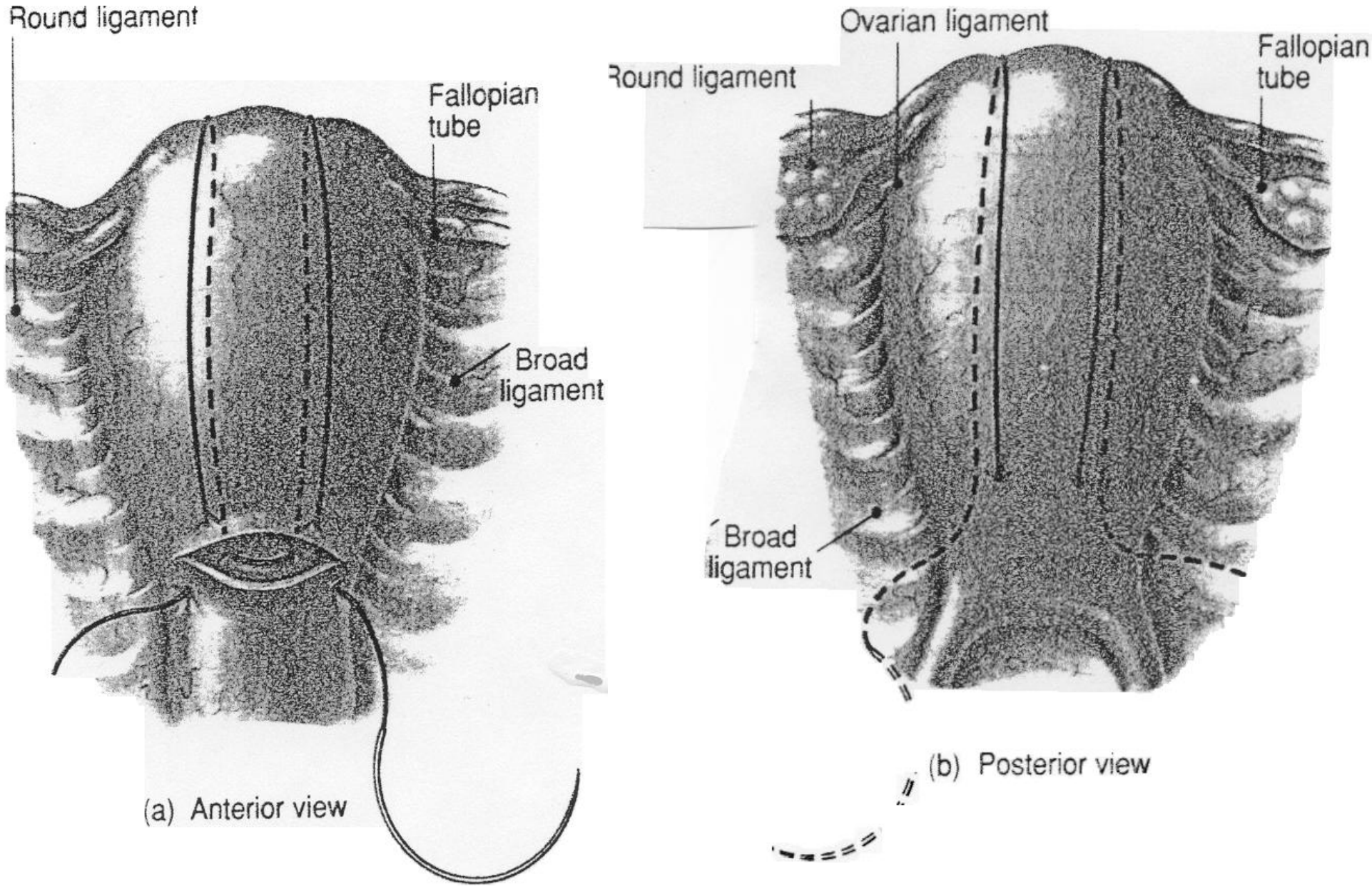
Bleeding unresponsive to oxytocics

If pharmacological measures fail, initiate surgical haemostasis sooner rather than later.

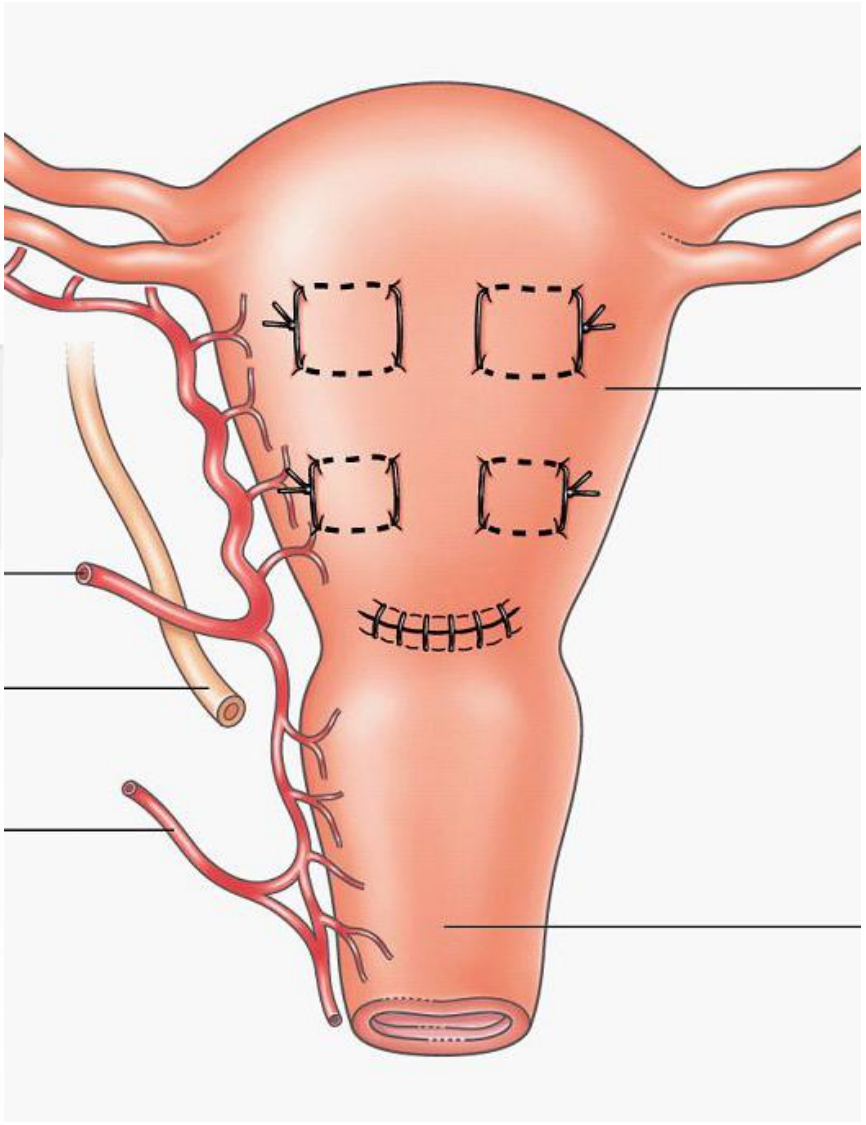
1. Intrauterine balloon tamponade is the firstline‘surgical’intervention.
2. haemostatic brace suturing (B-Lynch or modified compression sutures)
3. bilateral ligation of uterine arteries
4. bilateral ligation of internal iliac (hypogastric) arteries
5. selective arterial embolisation

Intrauterine balloon tamponade




Round ligament
Fallopian tube
Broad ligament
(a) Anterior view
Ovarian ligament
Round ligament
Fallopian tube
Broad ligament
(b) Posterior view

(c) Anterior view



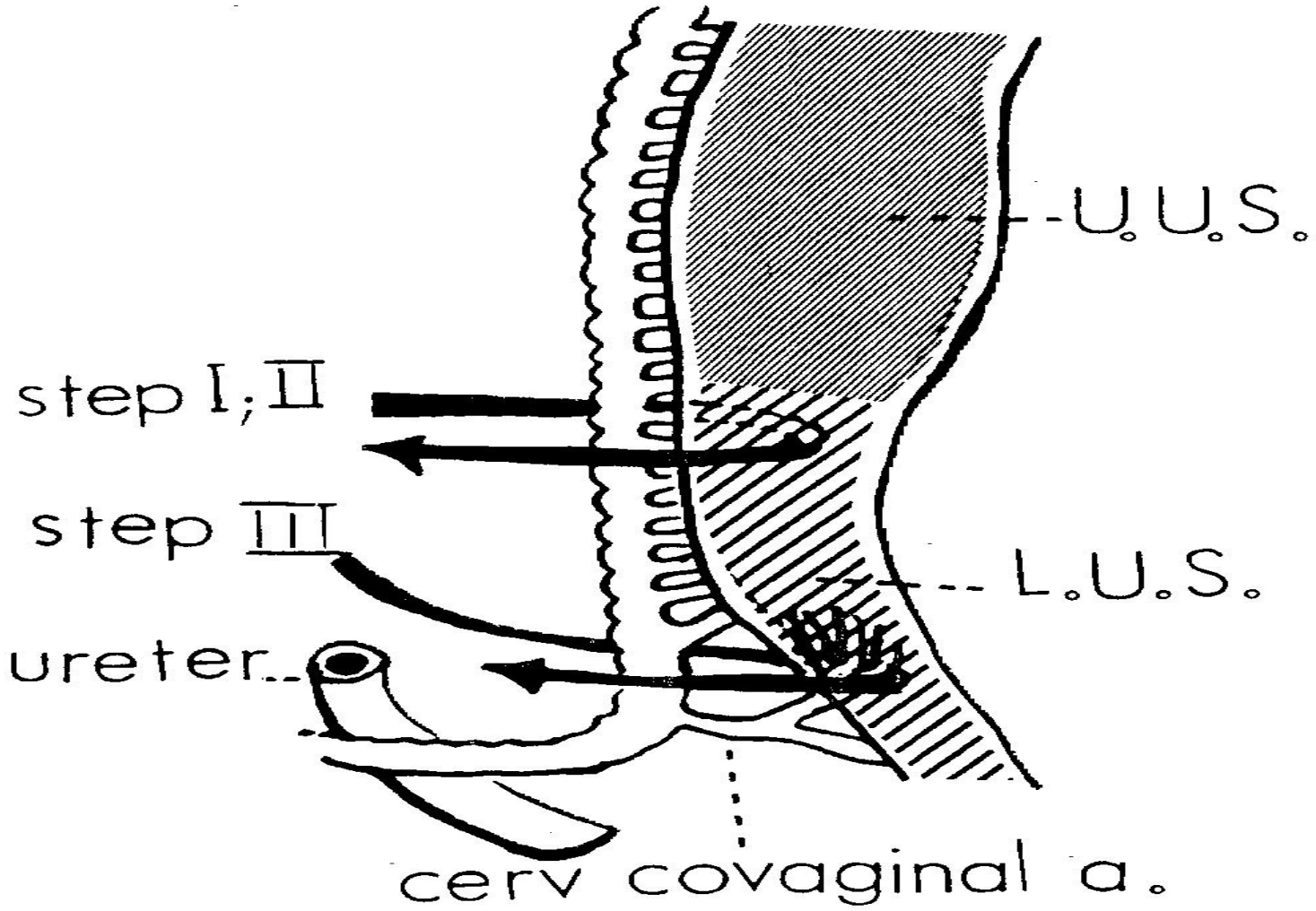
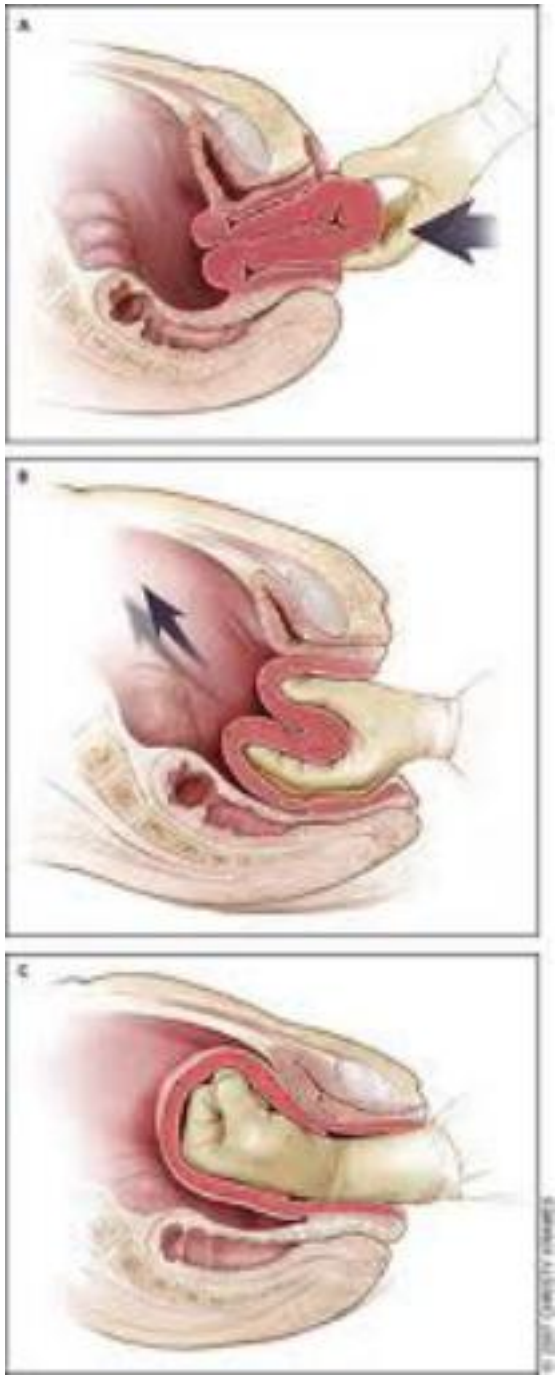


Fig. 1. Sites of uterine artery ligation in steps 1, 2 *(upper arrow)*, and 3 *(lower arrow)*. *U.U.S.*, Upper uterine segment; *L.U.S.*, Lower uterine segment.

6. Resort to hysterectomy SOONER RATHER THAN LATER (especially in cases of placenta accreta or uterine rupture).



How to deal with uterine Inversion

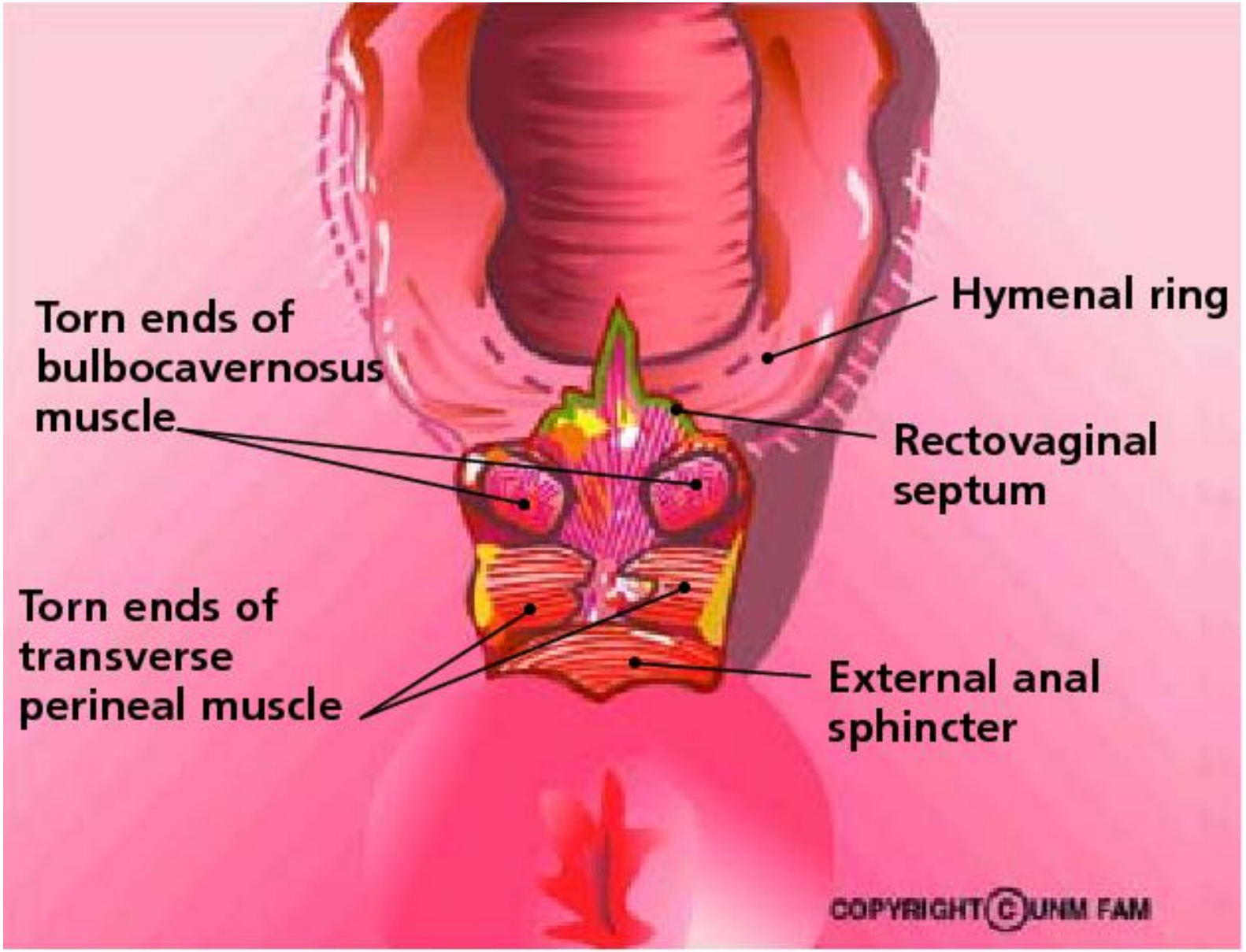
To replace the uterus, the palm is placed on the center of the inverted fundus, while fingers identify the cervical margins. Upward pressure by the palm restores the uterus and elevates it past the level of the cervix.

Repair of lacerations

- The vagina and cervix should be carefully inspected.
- The episiotomy is quickly repaired after massage has produced a firm, tightly contracted uterus.
- Begin the repair above the highest extent of the laceration.
- If the laceration extended into the broad ligament, it should be repaired by laparotomy or hysterectomy is required.

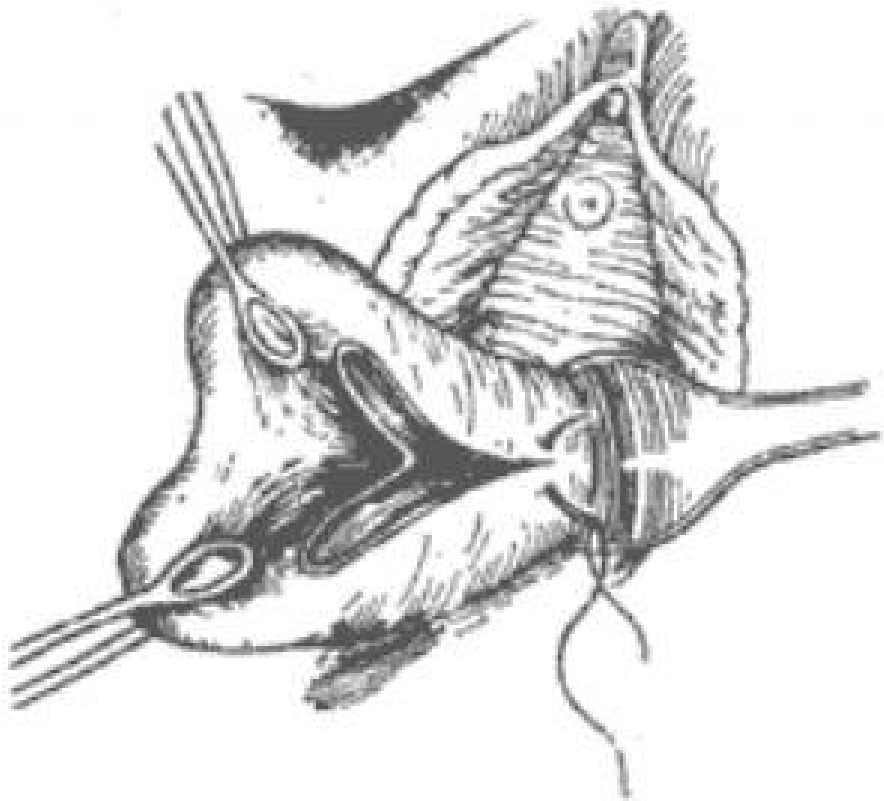
Perineal lacerations

1st degree	Laceration of vaginal epithelium or perineal skin only	
2nd degree	Involvement of the perineal muscles but not the anal sphincter	
3rd degree	Disruption of the anal sphincter muscles	3a: <50% thickness of external sphincter torn 3b: >50% thickness of external sphincter torn 3c: internal sphincter torn
4th degree	Third degree tear with disruption of the anal epithelium as well	


Torn ends of bulbocavernosus muscle
Hymenal ring
Rectovaginal septum
Torn ends of transverse perineal muscle
External anal sphincter
COPYRIGHT © UNM FAM

Inspection of cervix

- The patient should have adequate anesthesia.
- The wall of the vagina should be retracted to explore the cervix.
- Clamp the anterior lip of the cervix with one pair of ring forceps, and examine the whole circle of the cervix.



Vaginal Hematoma

- The blood vessel was injured without disrupting the epithelium above it.
- It can be managed expectantly unless it is tense or expanding.
- If it is surgically removed, the bleeding vessel should be ligated.

Rupture of the uterus

- Laparotomy and repair of the ruptured uterus
- Hysterectomy

Management of retained tissue

- Careful inspection of the placenta (placenta succenturiata)
- If the suspicion is high:
  - explore the uterus manually
  - examine the uterus by ultrasound
- D & C for both diagnostic and therapeutic methods

Management of retained tissue

- Placenta accreta should be suspected if tissue can not be removed.
- Conservative treatment
- Hysterectomy

The summary of Primary PPH

- The definition and the four causes of postpartum hemorrhage;
- The clinical manifestations of postpartum hemorrhage with different causes;
- To explain the treatment measures, principles in emergency treatment in detail for postpartum hemorrhage

Part. II Secondary PPH

- Excessive bleeding occurred 24hrs or more after delivery while within 6 weeks.
- Clinically worrisome uterine hemorrhage develops within 1 to 2 weeks in perhaps 1 percent of women.

Secondary PPH : causes

- Abnormal involution of the placental site
- Infection
- Retained products of conception
- Uterine artery pseudoaneurysm
- Other genital tract pathology (Rare):
  Cervical cancer, trophoblastic disease

Diagnosis & Treatment

- Evaluate overall clinical condition
  - amount of blood loss
  - speculum exam: cervix
  - bimanual exam: uterus
  - US: retained tissue
  - CBC & CRP: infection
- Antibiotic cover
- Possible uterine evacuation

Thank You !