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Uterine Balloon Tamponade

A Workshop for Frontline Health
Workers

Learning Objectives

1. Describe indications and contraindications for uterine balloon tamponade.
2. Assemble a uterine balloon tamponade kit.
3. Describe the steps of the uterine balloon tamponade technique.
4. Perform uterine balloon tamponade procedure on an anatomic model.
5. Explain how to monitor uterine balloon tamponade clients.

Postpartum Hemorrhage (PPH)

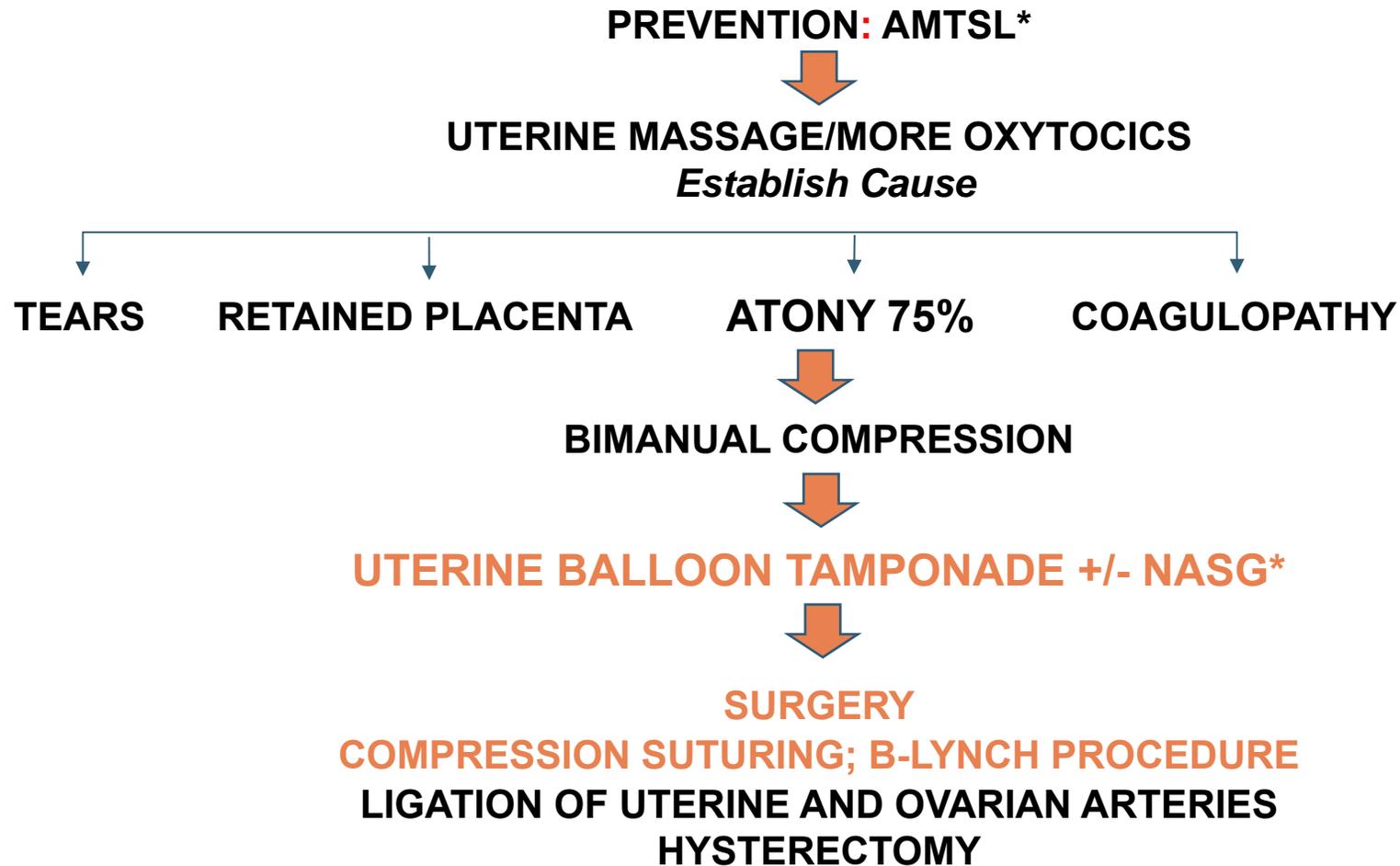
All women who give birth risk developing PPH!

- Blood loss > 500 cc within 24 hours after childbirth
- #1 cause of maternal death in developing countries (Africa and Asia: 30%, WHO 2012)
- **Mostly preventable**
- **Uterine atony is the leading cause**
- **Death can occur within 2 hours if emergency treatment is not provided!**

General Management of PPH

1. Call for help!
2. Massage the uterus.
3. Secure an IV line.
4. Make sure the bladder is empty.
5. Administer a uterotonic: oxytocin, misoprostol, syntometrine, or ergometrine.
6. Identify the cause (4Ts: thrombin, tissue, tone, trauma).

Management of PPH Caused by Atony

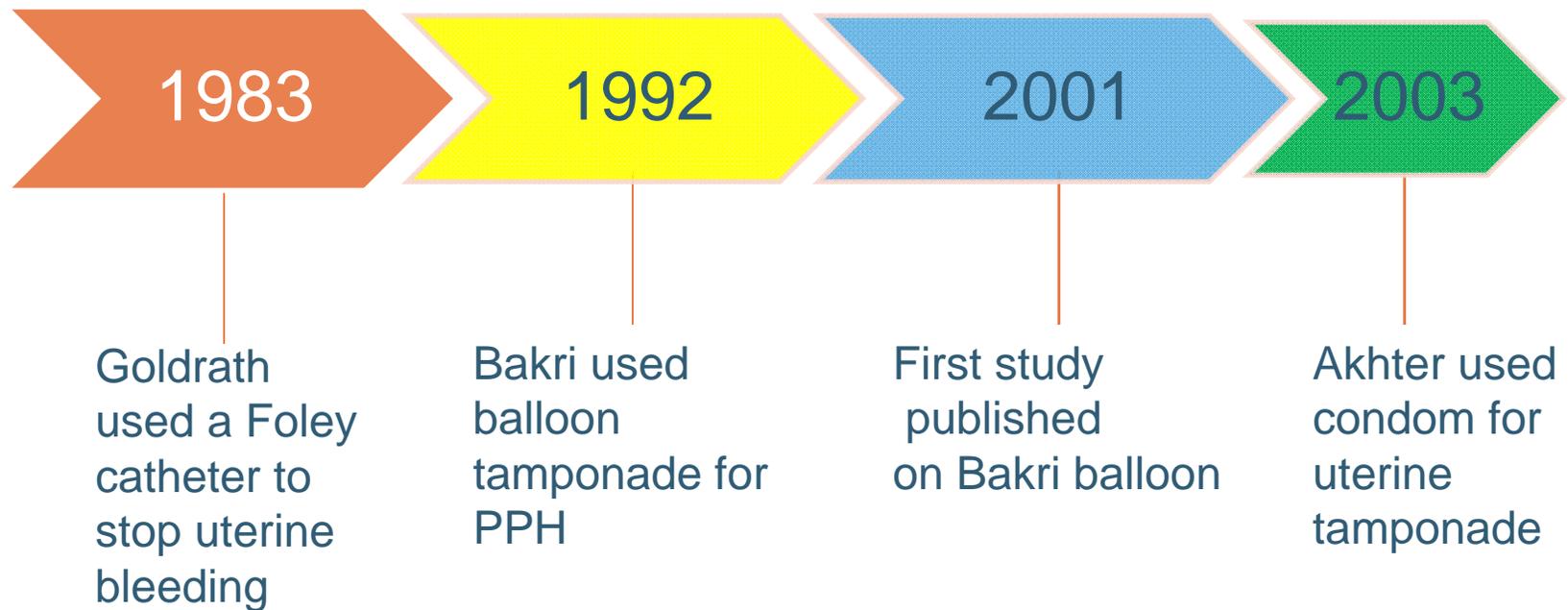


When will you use UBT in your facility?

Uterine balloon tamponade (UBT) is one step in a comprehensive PPH management plan

Always follow national guidelines and integrate UBT into care when appropriate

Evolution of Uterine Tamponade



Mechanism of Action

1. Increased intrauterine pressure, which becomes superior to capillary blood vessels pressure
2. Compression of the bleeding site by the inflated condom
3. Contractions induced by the presence of the condom inside the uterus (due to the release of prostaglandins?)

Source: Keski-Nisula L, Heiskanen P, Heinonen S. 2011. Extra-membraneous pregnancy, prolonged ruptured membranes and circumvallate placenta. *Acta Obstetrica et Gynecologica Scandinavica*. 90:1170–1171.

Indications

- Postpartum hemorrhage due to atony, when uterine massage, uterotonics, and bimanual compression have failed to stop the bleeding
- When temporary control of PPH is needed before referring the client to a higher level of care

Contraindications

- Arterial bleeding requiring surgical exploration or angiographic embolization
- Cases requiring hysterectomy
- Untreated uterine anomaly, cervical or uterine cancer
- Uterine infections
- Disseminated intravascular coagulation
- A surgical site that would prohibit the device from effectively controlling bleeding
- Lack of trained provider

Uterine Tamponade Kits

High-cost kits

- Readily available
- Different types of balloon
- Single use

Low-cost kits

- Based on the use of a condom
- Components available in most health facilities
- Must be assembled

High-Cost Balloon Tamponade Devices



Bakri
\$250 per device



Sengstaken–Blakemore
\$220 for two devices



BT-CATH
\$200 per device



Rusch hydrostatic
\$77 per device
(quoted £50)

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

Low-Cost Balloon Tamponade Devices



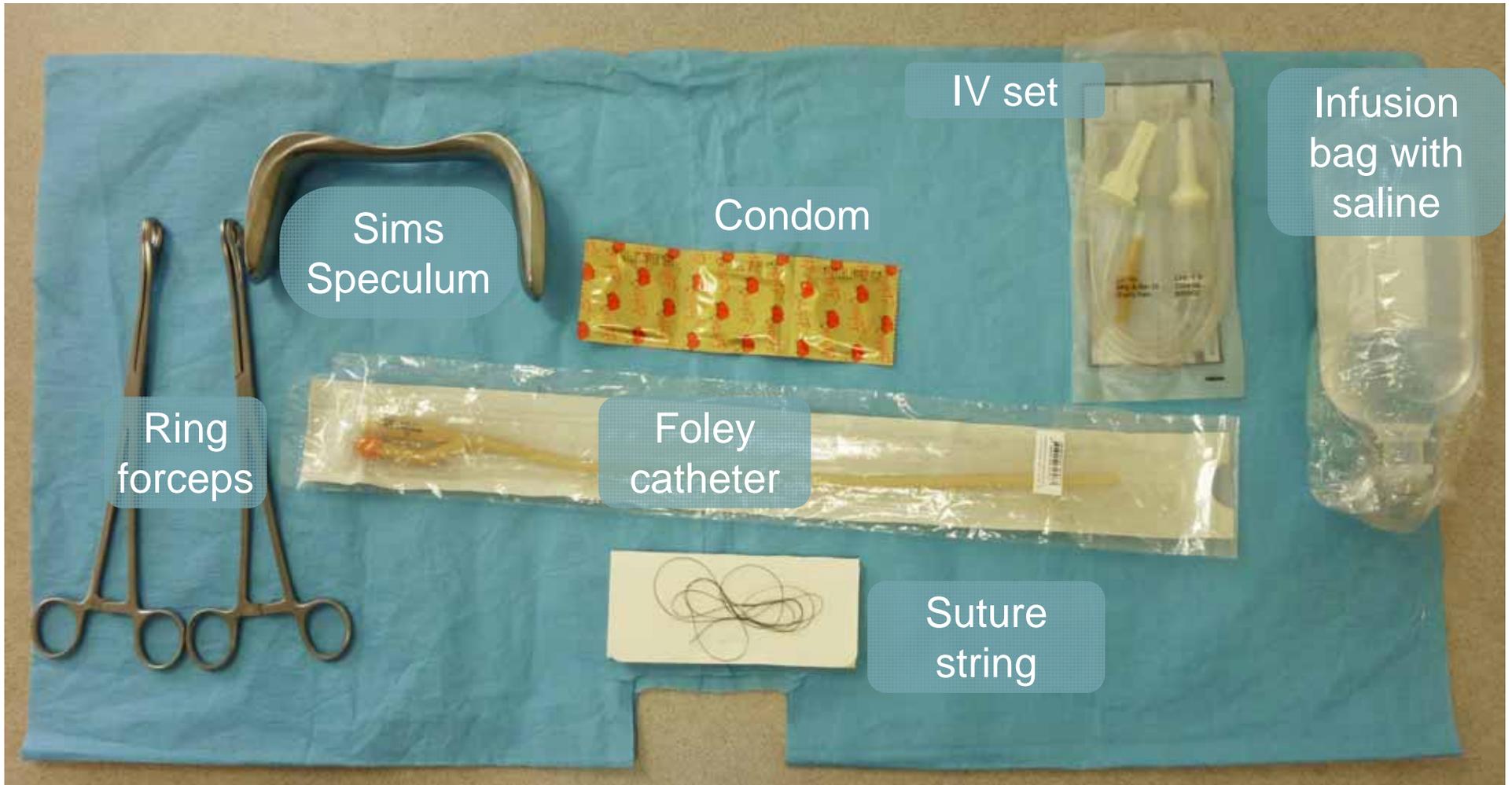
Akhter's CT unit \leq \$5



Massachusetts General Hospital (MGH) CT unit $<$ \$5

Balloon Tamponade Kit

made with supplies that are already available in most health centers



Do you have what you need to use UBT in your facility?

- Do you have all the materials required for the kit?
- Trained providers?
- Staff who know how to assist?
- System for documentation?
- What happens when supplies run out?

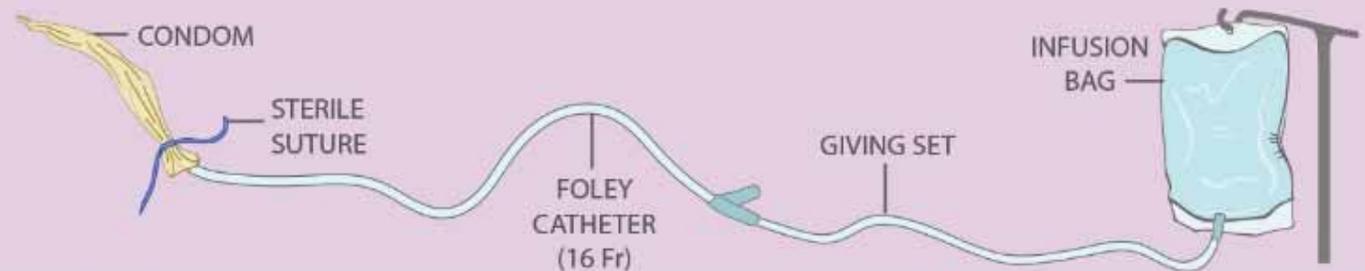
Step 1: Preparation

- Call for help!
- Obtain a UBT kit or assemble elements of the kit.
- Explain to the woman what her condition is and what you are going to do.
- Administer prophylactic antibiotics: 2 g ampicillin or 2 g cephalosporin IV.
- Make sure the bladder is empty.
- Make sure the source of bleeding is atony and ***not*** lacerations or retained placenta.

Assemble Uterine Balloon Tamponade

Preparation Kit

Use sterile suture to tie lower end of condom snugly on Foley catheter.



- Place the condom over the Foley catheter, leaving a small portion of the condom beyond the tip of the catheter.
- With sterile suture or string, tie the lower end of the condom snugly on the Foley catheter.
- Tie should be tight but should not strangulate the catheter and prevent inflow of water.

Step 2: Transvaginal Placement (after Vaginal Delivery)

- Determine that the uterus is clear of any retained placental fragments, arterial bleeding, or lacerations.
- Assemble the balloon tamponade.
- Expose the cervical opening with a Sims speculum and clamp the anterior portion of the cervix with a sponge or ring forceps.
- Insert the condom attached to the catheter under direct visual control, and with the aid of forceps, make certain that the entire condom is inserted past the cervical canal and internal os.

Step 2: Transvaginal Placement (cont.)

Insertion

Use aseptic technique.

Ensure bladder is empty, use catheter if needed.

Hold cervix with ring forceps.

Place a Sims speculum in posterior vaginal wall.

Insert catheter with condom tied onto the end, into vagina.

Holding cervix with forceps, push condom further into uterus.

Confirm condom position inside uterus.

Step 3: Inflation

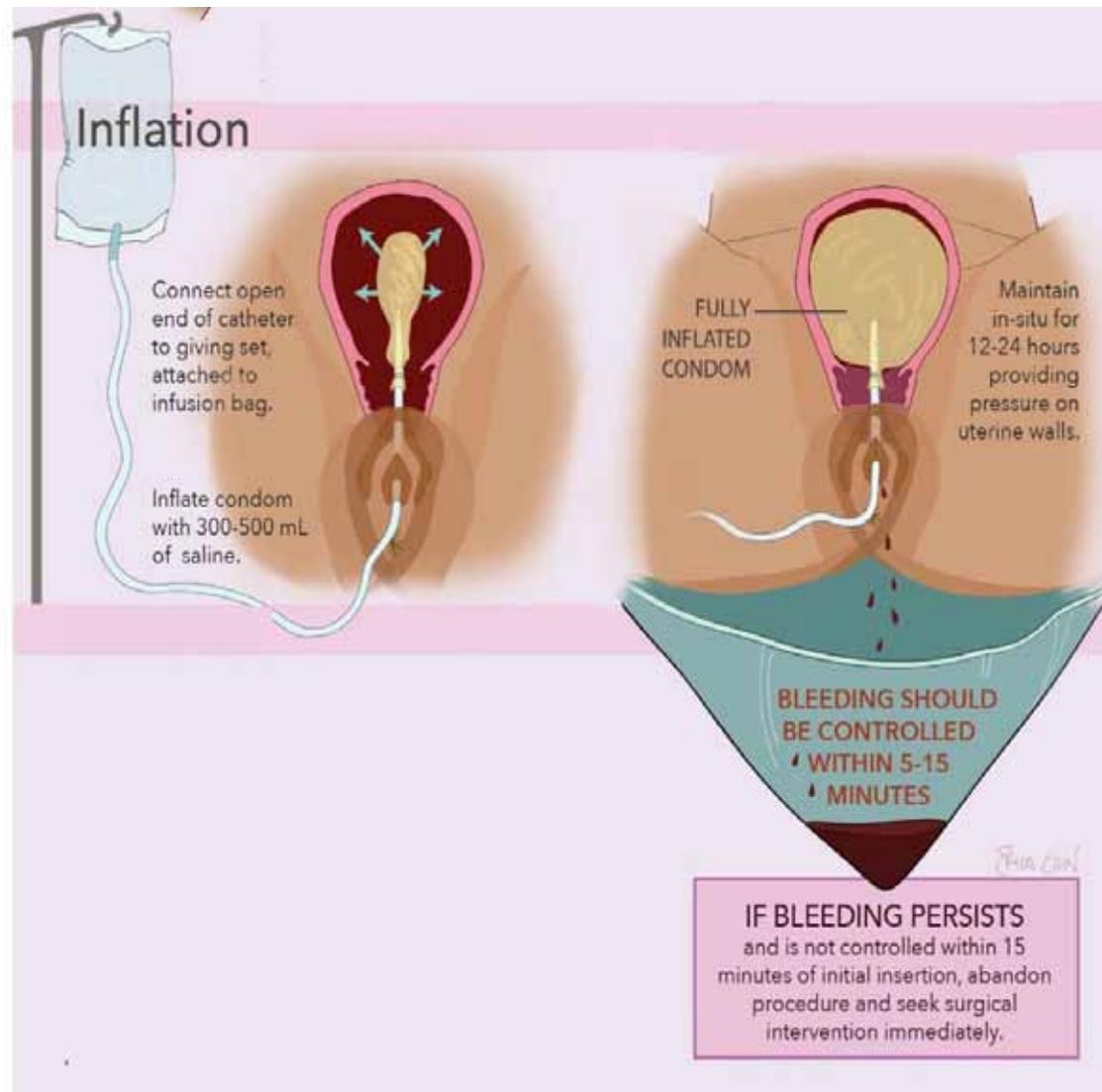
- Inflate UBT by connecting open/outlet end of catheter to giving set connected to infusion bag.
- Inflate condom with water or saline to about 300–500 mL.
- Clamp catheter when desired volume is achieved and bleeding is controlled.
- If bleeding is not controlled within 15 minutes of initial inflation of UBT, abandon procedure and seek surgical intervention immediately.

Step 3: Inflation (cont.)

- Maintain in situ for 12–24 hours if bleeding is controlled and client is stable.
- Continue to monitor client closely; resuscitate and/or treat shock necessary.
- Place a pen mark on the abdomen at the level of the uterine fundus. Monitor for rise in fundus (sign of concealed bleeding).
- Continue uterotonic infusion for 6–8 hours.



Step 3: Inflation (cont.)



Placement during Cesarean Delivery: Transabdominal Placement

- Determine that the uterus is clear of any retained placental fragments, arterial bleeding, or lacerations.
- Determine uterine volume by intraoperative direct examination.
- From above (via access of the cesarean incision), put the condom partly in the uterine cavity.

Placement during Cesarean Delivery: Transabdominal Placement (cont.)

- Have an assistant pull the Foley catheter through the cervix and the vaginal canal and make sure the condom is entirely in the uterine cavity.
- Close the incision per normal procedure, taking care to avoid puncturing the condom while suturing.
- Inflate the condom by connecting open/outlet end of catheter to giving set connected to infusion bag with saline.

Step 4: Deflation

- When client is stable (after 12–24 hours), slowly deflate condom by letting out 200 mL of saline every hour.
- Re-inflate to previous level if bleeding reoccurs while deflating. (Persistent or recurrent bleeding is an indication to proceed with another treatment option.)
Re-inflate as a temporary measure and reconsider surgical intervention.
- UBT may be kept in place for up to 24 hours.

Step 4: Deflation (cont.)

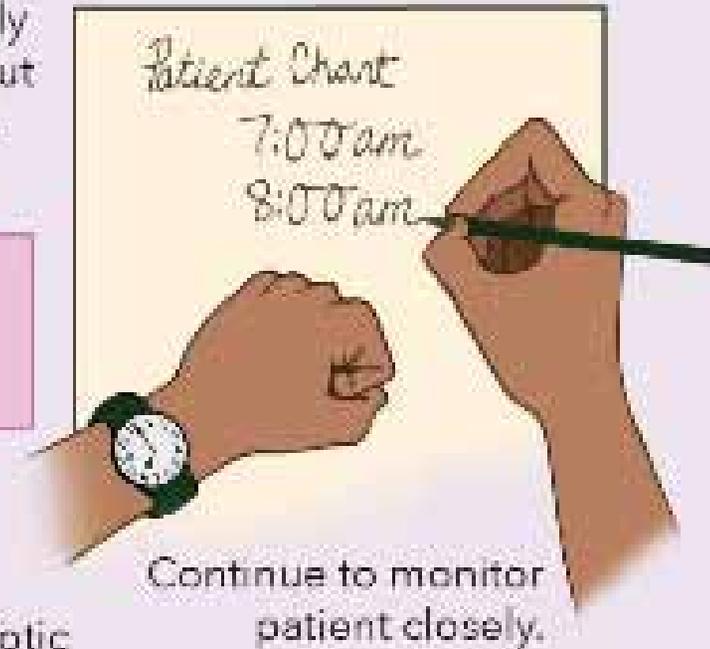
Deflation

When patient is stable, slowly deflate condom by letting out 200 mL of saline every hour, recording each time.

Re-inflate condom if bleeding reoccurs while deflating.



Give broad spectrum antibiotic to prevent intrauterine infection.



Continue to monitor patient closely.

Client Monitoring

- Monitor closely for the next 6 hours.
- The following information should be recorded every 15 minutes for the first 2 hours, then every 30 minutes for the next 2 hours, and then every hour for the next 2 hours:
 - Blood pressure
 - Pulse
 - Urine output
 - Pallor and active bleeding
 - Uterine tone
- The device should not be left indwelling for more than 24 hours.

Document

Each time a uterine balloon tamponade is placed, document the following in the client's record:

- Outcome of placement
- Blood loss before and after UBT placement
- Volume of liquid used to fill the condom
- Time from insertion to cessation of bleeding
- Deflation start time and time of complete removal
- Type of provider placing it—nurse, midwife, or doctor

Practice This Skill and Prepare for Emergencies

- On-the-job practice:
 - Assembly of UBT and insertion using anatomic models
 - Review of staff roles during emergencies
- Prepare facility:
 - Assemble kits and store them for easy access during emergencies
 - Have a plan to identify when supplies are low and ensure that new supplies are acquired

Effectiveness of Uterine Balloon Tamponade

- Success rate can reach 97%.
- UBT when successful leads to a significant reduction in need for surgery.
- Based on the success rate, the World Health Organization is recommending UBT as a second line of treatment in cases where uterotonics and bimanual compression fail.

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Systematic review

Uterine balloon tamponade for the treatment of postpartum haemorrhage in resource-poor settings: a systematic review

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Background Effective interventions addressing postpartum haemorrhage (PPH) are critically needed to reduce maternal mortality worldwide. Uterine balloon tamponade (UBT) has been shown to be an effective technique to treat PPH in developed countries, but has not been examined in resource-poor settings.

Objectives This literature review examines the effectiveness of UBT for the treatment and management of PPH in resource-poor settings.

Search strategy Publications were sought through searches of five electronic databases: Medline, Cochrane Reference Libraries, CINAHL (Cumulative Index to Nursing and Allied Health Literature), Embase and Popline.

Selection criteria Titles and abstracts were screened for eligibility by two independent reviewers. Each reviewer evaluated the full text of potentially eligible articles by defined inclusion criteria, including the presentation of empirical data and use of UBT in resource-poor settings to treat PPH.

Data collection and analysis Full text of all eligible publications was collected and systematically coded.

Main results The search identified 13 studies that met the inclusion criteria: six case reports or case series, five prospective studies and two retrospective studies for a total of 241 women. No randomised controlled trials were identified. The studies used various types of UBT, including condom catheter ($n = 193$), Foley catheter ($n = 5$) and Sengstaken-Blakemore oesophageal tube ($n = 1$). In these studies, primarily conducted in tertiary-care settings rather than lower-level health facilities, UBT successfully treated PPH in 234 out of 241 women.

Conclusions UBT is an effective treatment for PPH in resource-poor settings. Further study of UBT interventions is necessary to better understand the barriers to successful implementation and use in these settings.

Keywords Maternal mortality, postpartum haemorrhage, resource-poor settings, treatment, uterine balloon tamponade.

Comprehensive PPH Reduction Approach

PROMOTION OF COMPREHENSIVE PACKAGE OF INTERVENTIONS TO PREVENT AND MANAGE PPH

Education: Birth Planning/Complication Readiness; Promotion of ANC; Encouragement of Facility Birth with Skilled Birth Attendant

Facility Birth:

- Correct management of labor and birth, including partograph
- Routine administration of **uterotonic** immediately after birth (oxytocin preferred; if not, misoprostol)
- Uterotonic availability and quality
- Postpartum vigilance for PPH
- Proper management of PPH

Transport:

- Initial dose of uterotonic
- Use of UBT
- Use of non-pneumatic anti-shock garment

Home Birth:

- Education about PPH detection
- Education about use of misoprostol
- Advance distribution of misoprostol for self-administration after birth
- Education about what to do for continued bleeding

In Summary

- UBT treats PPH due to uterine atony when uterotonics and bimanual compression fail to stop bleeding.
- It reduces the need for surgical intervention and blood transfusion and can be used during transfer.
- UBT should be part of the PPH emergency kit: sterile gloves, IV infusion bag with saline, IV giving set, 2 ring forceps, scissors, condom, Sims speculum, Foley catheter, and suture.

In Summary (cont.)

- Before insertion of UBT, make sure the uterus is clear of any retained placenta or fragments and no lacerations are present.
- If bleeding is not controlled within 15 minutes of UBT insertion, seek surgical care immediately.
- Do not use UBT when there is arterial bleeding, cervical or uterine cancer, danger of uterine rupture, infections, uterine anomalies, or disseminated intravascular coagulation.

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