

Lebanese Society of Obstetrics & Gynecology

Protocol for the prevention and management of

POST PARTUM HEMORRHAGE

Postpartum hemorrhage was the cause of at least 65% of the 60 maternal deaths that occurred in Lebanon between 2010 and mid-2015.

Postpartum hemorrhage (PPH) occurs in about 5 percent of all deliveries, and it is life-threatening in 3-4 per thousand deliveries.

Because PPH is a leading cause of maternal morbidity and death, it is essential to develop and implement a national protocol for its prevention and management in order to optimize maternal peripartum outcomes.

The following aspects of postpartum hemorrhage need to be addressed:

- Definition
- Risk factors
- Prevention
- Resuscitation
- Treatment (nonsurgical and surgical)

Definition

Postpartum hemorrhage is present when there is a cumulative blood loss of at least 1000 mL or blood loss accompanied by signs/symptoms of hypovolemia within 24 hours of the birth process (includes intrapartum loss). It is life-threatening when the estimated blood loss exceeds 2.5 liters or when the patient needs more than 5 units of blood products or when she develops a coagulopathy.

For practical purposes, and due to the inherent unreliability of estimating blood loss, PPH may also be defined as any amount of bleeding that threatens hemodynamic stability; its very first sign would be a maternal tachycardia (pulse rate >100 per minute), which precedes the development of hypotension.

Risk factors

The majority of women who experience PPH do not have any known risk factors, but those at highest risk include women with:

- Suspected or proven placental abruption
- Known placenta previa
- Multiple pregnancy
- Preeclampsia

It is advised that women with these risk factors deliver in a hospital that has a 24-hour blood banking capability and a fully functioning intensive care unit.

Women at risk of abnormal placentation such as those with previous cesarean delivery or previous placenta previa should have antenatal assessment of placental location.

Prevention

Because 80% or more of cases of postpartum hemorrhage are caused by uterine atony, active management of the third stage of labor traditionally involves 3 interventions:

- uterotonics, mainly oxytocin
- immediate cord clamping
- and controlled cord traction

The major driver of this preventive strategy's effectiveness is the administration of oxytocin. Controlled cord traction offers a minimal contribution to overall blood loss reduction in women who receive oxytocin. Moreover, a recent large body of evidence suggests that delaying cord clamping for 1-3 minutes after birth may have beneficial neonatal outcomes such as improved long-term iron stores and hemoglobin concentration without increasing the risk of maternal hemorrhage, but this should be decided upon by the managing obstetrician on a case-by-case basis depending on the appraisal of each specific situation.

Of the 3 interventions classically described in active management of the third stage of labor (oxytocin, immediate cord clamping, controlled cord traction), oxytocin, and oxytocin alone, remains the most important intervention for the prevention of PPH.

Oxytocin is the first-line uterotonic of choice for prevention of PPH due to uterine atony and should be given as 10 units by intramuscular injection or 5-10 units by slow intravenous injection over one minute; this is done at the time of delivery of the anterior shoulder of the fetus, or may be given immediately following delivery of the placenta.

Intramuscular Methergin is not recommended for routine use and is definitely contraindicated in case of maternal hypertension.

Resuscitation

A multidisciplinary approach with strong communication with anesthesia is recommended for fluid management and indications for blood products.

If excessive blood loss is ongoing, the following general supportive measures need to be instituted:

- ample intravenous access, with insertion of a second large-bore intravenous line
- rapid crystalloid infusion (normal saline or Ringer's lactate)
- blood bank notification that blood products may be necessary
- prompt communication with the anesthesiologist
- blood collection for baseline laboratory determinations (CBC, PT, PTT, fibrinogen, creatinine, SGOT, SGPT)

Treatment

Identifying the cause of hemorrhage is important (uterine atony vs genital tract laceration vs adherent placenta).

Because the single most common cause of hemorrhage is uterine atony, the finding on bimanual pelvic examination of the characteristic soft, poorly contracted, boggy uterus

suggests atony as a causative factor. Manual compression of the uterus can expel blood and clots and allow time for other measures to be implemented.

Even if atony is present, other etiologies must be considered. Lacerations should be ruled out by careful visual assessment of the lower genital tract. Adequate anesthesia and adequate operative assistance are necessary for the identification and proper repair of lacerations. Satisfactory repair may require transfer to a well-equipped operating room.

Transfusion of blood products may be needed to replace coagulation factors and red cells, not for volume replacement. To avoid dilutional coagulopathy, concurrent replacement with coagulation factors and platelets may be necessary in cases of severe hemorrhage. Massive transfusion may be needed in some cases and should be conducted in close consultation with an anesthesiologist.

○ **Medical management of PPH**

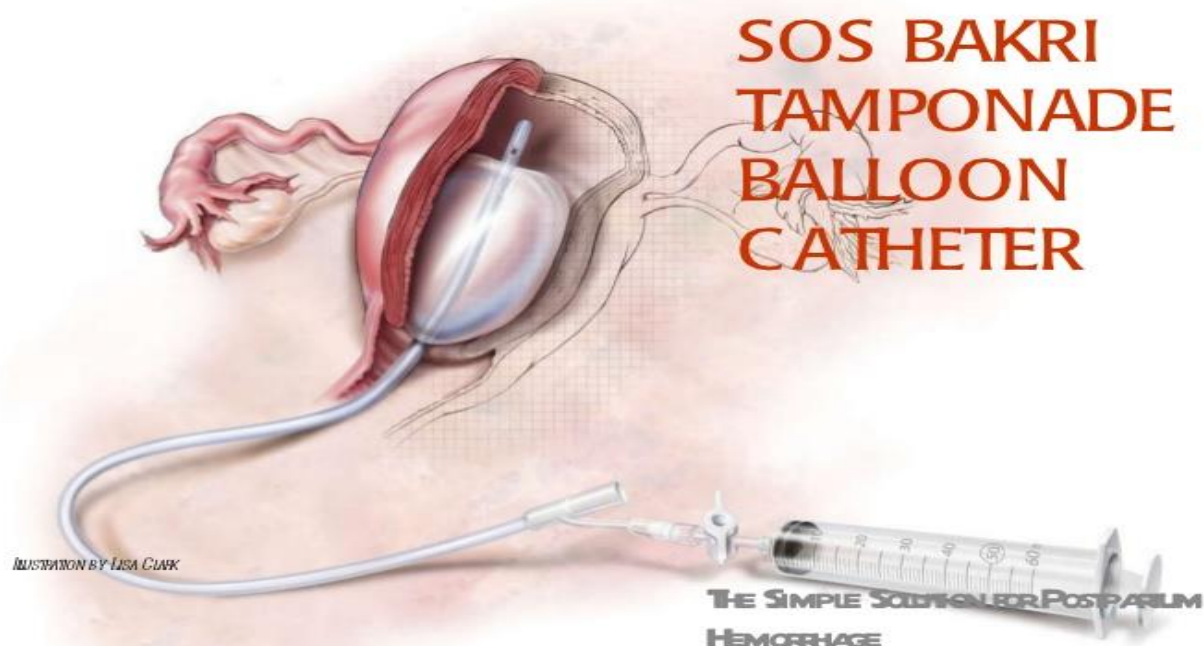
Ongoing blood loss in the setting of decreased uterine tone requires the administration of additional uterotonics as the first-line treatment for hemorrhage:

- Oxytocin 10-40 units in one liter normal saline or lactated Ringer's in a free-running intravenous drip

plus

- Carboprost (**Prostin 15M**) one ampoule IM; this may be repeated every 15-90 minutes, up to a maximum of 8 doses (to be avoided in asthmatic patients)
- **or** Misoprostol (**Cytotec**) 4 or 5 tablets rectally

When uterotonics fail to cause sustained uterine contractions and satisfactory control of hemorrhage after vaginal delivery, tamponade of the uterus with the SOS Bakri tamponade balloon can be effective in decreasing hemorrhage secondary to uterine atony.



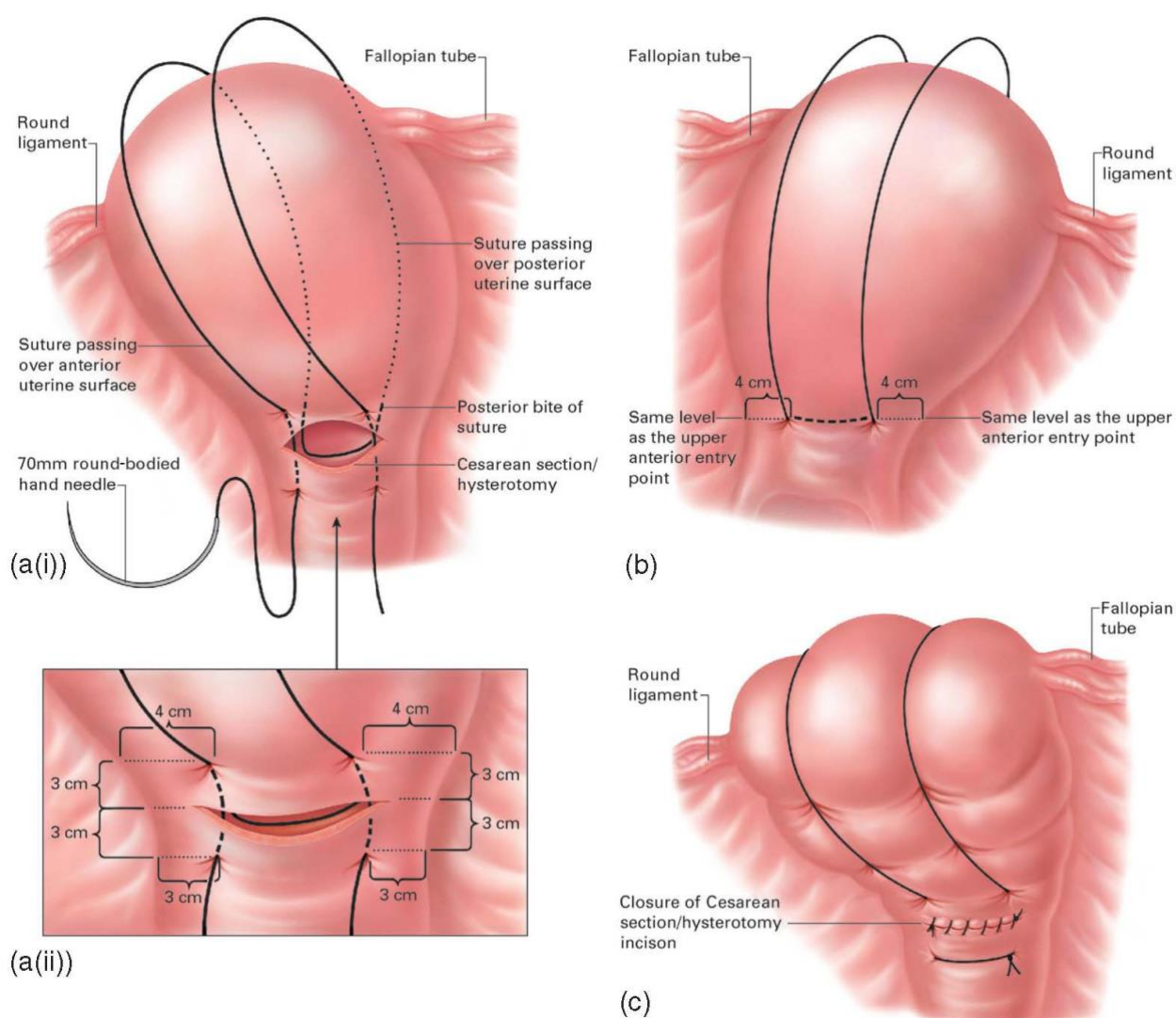
Intravenous tranexamic acid (**Exacyl**) may be considered when initial medical therapy fails, and early use is likely to be superior to delayed treatment. A dose of one gram is given slowly I.V. over 10 minutes, and may be repeated after 8 hours if needed.

In case of continuing bleeding, arterial embolization of the uterine arteries may be indicated if the vital signs are stable and the rate of blood loss not excessive, *and* if rapid access to interventional radiology is available.

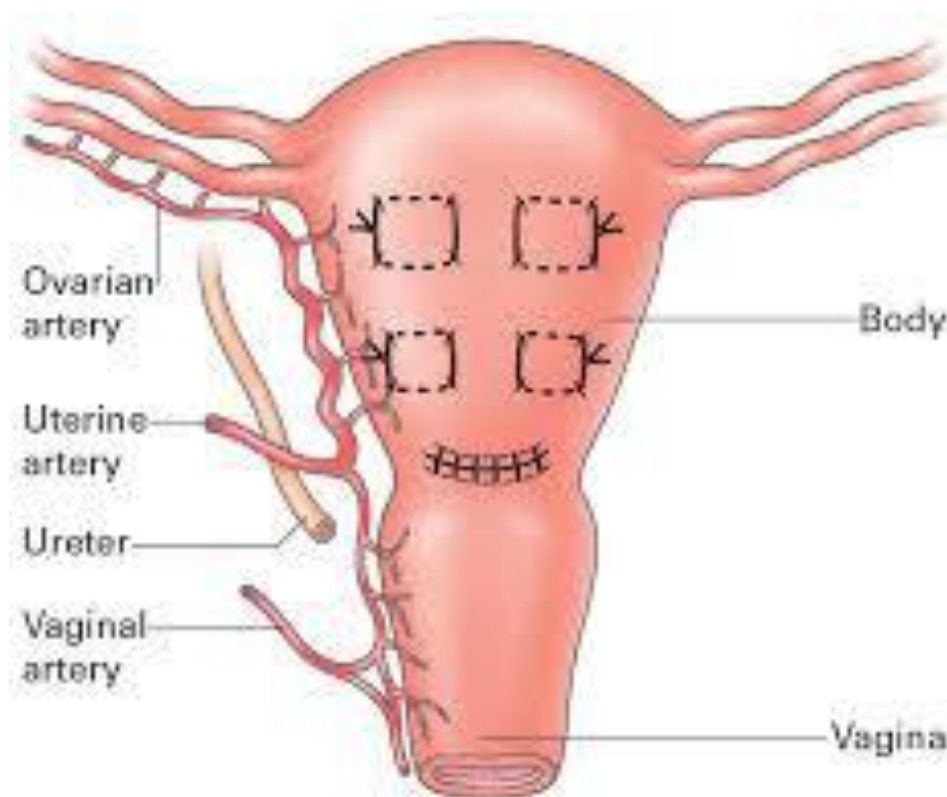
○ **Surgical management of PPH**

When all the above measures fail to control bleeding in a patient who has delivered vaginally, laparotomy with a vertical midline abdominal incision is indicated for bilateral ligation of the uterine arteries. Hypogastric artery ligation has been found to be considerably less successful than originally thought, and is potentially very dangerous because of the excessive vascularity of the surrounding space in late pregnancy; it should not even be attempted by general obstetricians.

If hemorrhage due to uterine atony persists after either vaginal or cesarean delivery in spite of all the above measures, a **brace suture (B-Lynch compression suture)** of the uterus may be helpful in controlling the bleeding.



Another alternative is to perform hemostatic multiple square suturing of the uterus; this procedure eliminates space in the uterine cavity by suturing both anterior and posterior uterine walls, and may even be helpful in some cases of placenta previa or accreta.



Hysterectomy may have to be performed as a life saver when all else fails.

Clinical considerations for suspected placenta accreta

Women at high risk or abnormal placentation need special emphasis. Although most PPH cannot be predicted, abnormal placentation is one clinical entity in which the risk can be anticipated. Appropriate planning of delivery from timing to location, with transfer to a tertiary hospital as needed, is paramount.

The major risk factor for placenta accreta is placenta previa with or without previous uterine surgery.

In a multicenter study of more than 30,000 patients who had cesarean delivery without labor, the risk of placenta accreta increased from 0.3% in those with one previous cesarean to 7.7% in those with 5 previous cesareans. In patients with placenta previa in the current pregnancy, the risk of accreta was 3%, 11%, 40%, 61%, and 67% for those undergoing their first through fifth or greater cesarean deliveries, respectively.

In the presence of previa or a history of cesarean delivery, the obstetrician must have a high index of suspicion for placenta accreta. Ultrasonography (with or without MRI) may be helpful in establishing the diagnosis in the antepartum period, but despite advances in imaging modalities, no diagnostic technique affords the clinician complete assurance of the presence or absence of placenta accreta.

If the diagnosis or a strong suspicion is attained before delivery, a number of measures should be taken:

- The patient should be counseled about the likelihood of hysterectomy.
- Blood products and clotting factors should be available
- The appropriate location and timing for delivery should be considered to allow access to adequate surgical personnel and equipment.

Uterine rupture

Abnormal labor, operative delivery, and placenta accreta can lead to rupture of the uterus and intra-abdominal hemorrhage. Surgical repair is often possible when the rupture is confined to the scar of a previous cesarean delivery, but hysterectomy may be required in a life-threatening situation regardless of the patient's wishes for preservation of future fertility.

Uterine inversion

Uterine inversion is associated with marked hemorrhage. If the inversion occurs *before* placental separation, detachment of the placenta should *not* be undertaken as it will lead to additional hemorrhage.

Manual replacement with the fingertips exerting upward pressure circumferentially, with or without uterine relaxation, is usually successful.

CONCLUSIONS

- ❖ Uterotonic agents should be the first-line treatment for postpartum hemorrhage due to uterine atony.
- ❖ Management may vary greatly among patients, depending on etiology and available treatment options, and often a multidisciplinary approach is required.
- ❖ When uterotonics fail following vaginal delivery, exploratory laparotomy is the next step.
- ❖ In the presence of conditions known to be associated with placenta accreta, the obstetrician must have a high clinical suspicion and take appropriate precautions.

REFERENCES

1. World Health Organization. WHO recommendations for the prevention and treatment of postpartum hemorrhage. Geneva: World Health Organization. 2012. Available at http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/9789241548502/en/
2. Gülmezoglu AM, Villar J, Ngoc NT, et al. WHO multicentre randomised trial of misoprostol in the management of the third stage of labour. *Lancet* 2001;358:689-95.

3. American College of Obstetricians and Gynecologists. Clinical management guidelines for obstetrician-gynecologists: Postpartum Hemorrhage. ACOG Practice bulletin no. 183. *Obstet Gynecol* 2017;130:e168-e186.
4. Royal College of Obstetricians and Gynaecologists. Prevention and management of postpartum haemorrhage. Green-top Guideline No. 52, December 2016. Available at <https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg52/>
5. Collège National des Gynécologues et Obstétriciens Français. Recommandations pour la pratique Clinique. Les hémorragies du post-partum. 2014. Available at http://www.cngof.asso.fr/data/RCP/CNGOF_2014_HPP.pdf
6. Dahlke JD, Mendez-Figueroa H, Maggio L, et al. Prevention and management of postpartum hemorrhage: a comparison of 4 national guidelines. *Am J Obstet Gynecol* 2015;213:76.e1-10.
7. Silver RM, Landon MB, Rouse DT, et al. Maternal morbidity associated with multiple repeat cesarean delivery. *Obstet Gynecol* 2006;107:1226-32.
8. D'Alton ME, Main EK, Menard MK, Levy BS. The National Partnership for Maternal Safety. *Obstet Gynecol* 2014;123:973-7.
9. Wright CE, Chauhan SP, Abuhamad AZ. Bakri balloon in the management of postpartum hemorrhage: a review. *Am J Perinatol* 2014;31: 957-64.