437 Team: Obstetrics and Gynecology

Postpartum Hemorrhage

Objectives:

- List the risk factors for postpartum hemorrhage.
- Constructa differential diagnosis for immediate and delayed postpartum hemorrhage.
- Develop an evaluation and management plan for the patient with postpartum hemorrhage including consideration of various resource settings.

References:

- Kaplan USMLE step 2 CK - Obstetrics and Gynecology
- Online Meded videos
- Team 435

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Color index: Important | Notes | Meded | Video-Case

Editing file link

Definition

It is blood loss >500 cc after vaginal delivery or >1000 cc after cesarean section.
In case if multiple gestations it will be >750cc after vaginal delivery and cesarean section usually will be the same

Classification

Primary PPH : **(99% of cases)**

it occurs **within the first 24 h** after delivery and it caused by:

1. Uterine atony **(80%)**
2. Laceration **(15%)**
3. Retained placenta (5%), especially placenta accreta
4. Uterine inversion
5. Defect in coagulation (DIC)

Secondary PPH: **(delayed)**

it occurs **between 24 h and 6-12 weeks** postpartum and it caused by:

- Infection (Endometriosis)
- Retained products of conception
- Inherited coagulation defect
- Abnormal placentation: (Subinovulation, accreta, retained)

1- Uterine Atony

Important

Definition:

- Uterine atony is Failure of the uterus to contract after placenta separation.
- It is the **most common** cause of excessive postpartum bleeding.

Clinical Findings:

- A soft uterus (feels like dough) palpable above the umbilicus.

after delivery, the uterine fundus must be just below the level of the umbilicus.

Risk factors :

1. Hx of PPH
2. Prolong or rapid labor **(most common)**
3. Grand multiparity (a parity of 5 or more)
4. Augmented (**induces**) labor with oxytocin
5. **Fast labor**
6. Overdistended uterus (As in multiple gestations, polyhydramnios, macrosomia baby)
7. Chorioamnionitis (if the patient developed chorioamnionitis the muscle will not work)
8. Uterine leiomyomata
9. Asian /hispanic ethnicity
10. Medications (MgSO4, β-adrenergic agonists,halothane)
11. Full Bladder (**Extended**)

Prevention:

Active management of the third stage of labor can reduce the incidence of PPH, It includes:

1. Fundal massage
2. Gentle cord traction
3. IV/ IM oxytocin

Management:

1. **Drain the bladder** because it is difficult to the uterus to contract if there is full bladder
2. **Uterine massage**
3. **Medical management (Uterotonic agents):**
   a. Methylergonovine: It works by increasing the rate and strength of contractions and the stiffness of the uterus muscles it's given IM and **contraindication in hypertension and arterial disease**
   b. Oxytocin: given IV to increase uterine tone
   c. Carboprost(Hemabate) 15-methyl prostaglandin F2α: it's stimulate the myometrium, it' given IM to contract and contraindication in asthma
   d. Prostaglandins such as misoprostol: given orally or rectally

4. **Uterine tamponade:** it used when medical management fails
   a. Bakri balloon inserted through a catheter
   b. Uterine packing with gauze

   Both of these methods work by applying pressure internally to stoan the flow a blood.

5. **Surgical:**
   a. B lynch suture (it compresses the uterus).
   b. Uterine artery ligation
   c. Uterine artery embolization

6. If all these steps failed **Hysterectomy** should be performed.

2-Lacerations

Risk factors :

1. Uncontrolled vaginal delivery **(most common)**
2. Difficult delivery
3. Operative vaginal delivery

Clinical Findings:

Identifiable lacerations (cervix, vagina, perineum) in the presence of contracted uterus.

Management:

Surgical repair

3-Retained Placenta

Risk factors :

1. Accessory placental lobe **(most common)**
2. Abnormal trophoblastic uterine invasion (e.g. cervix, vagina, perineum)

Clinical Findings:

Missing placental cotyledons in the presence of a contracted uterus

Management:

Manual removal or uterine curettage under ultrasound guidance.

4-Uterine Inversion "turning inside-out"

Risk factors :

1. Myometrial weakness **(most common)**
2. Previous uterine inversion

Clinical Findings:

Beefy-appearing bleeding mass in the vagina and failure to palpate the uterus abdominally.

Management:

Uterine replacement by elevating the vaginal fornices and lifting the uterus back into its normal position, followed by IV oxytocin

5- DIC

Risk factors :

1. Abruptio placenta **(most common)**
2. Severe preeclampsia
3. Amniotic fluid embolism
4. Prolonged retention of a dead fetus

Clinical Findings:

1. Generalized oozing or bleeding from IV sites
2. Lacerations in the presence of a contracted uterus.

Management:

1. Removal of pregnancy tissue from the uterus.
2. Intensive Care Unit (ICU) support.
3. Selective blood-product replacement.

Unexplained Postpartum Hemorrhage

★ If despite careful searching no correctable cause of continuing hemorrhage is found, it may be necessary to perform a laparotomy and bilateral surgically ligate the uterine or internal iliac arteries.

★ Hysterectomy would be the last resort.

Clinical	Diagnosis	Management
Uterus not palpable	**Inversion (rare)**	Elective vaginal fornices, IV oxytocin
Uterus like dough	**Atony (80%)**	Uterine massage, oxytocin, ergot, PG E2α
Tears vagina, cervix	**Lacerations (15%)**	Suture & repair
Placenta incomplete	**Retained placenta (5%)**	Manual removal or uterine curettage
Diffuse oozing	**DIC (rare)**	Remove POC, ICU care, blood products prn
Persistent bleeding	**Unexplained (rare)**	Ligate vessels or hysterectomy

Management and evaluation

1. General measures:
    a. Assess overall status including vital signs
    b. Nursing and physician support
    c. IV access blood availability
2. Evaluation :
    a. Bimanual exam. If you found a bulgy, soft uterus (feels like dough) above the umbilicus, this indicates uterine atony. You can also asses for retained placental fragments and ruptured uterine wall.
    b. Inspection for perineum, vulva, vagina and cervix
3. Target intervention: depending on the etiology

Blood replacement therapy

- When a patient experiencing PPH the idea now to interfein earlier to prevent coagulopathies such as DIC from developing.

- **Packed Red Blood Cell is the mainstay of Blood replacement therapy**

- When there is severe ongoing hemorrhage of 4 units PRBCs/1h OR ≥10 units PRBCs/12-24h It is recommended to transfuse with 1:1:1 ration

- It is recommended to transfuse with 1:1:1 ration (1 unit of packed blood cell: 1 unit of fresh frozen plasma: 1 unit of platelets)

MedEd notes :

Postpartum hemorrhage
>500 mL loss (vaginally)
>1000 mL loss (C/S)

	Uterine inversion	Uterine atony	Retained placenta	Vaginal laceration
Pathology	"Uterus births itself" -Excess oxytocin -Traction of the placenta	**Most common cause of PPH** -Prolonged labor -Oxytocin (causes exhaustion of the myometrium) -Tocolytics	-Placenta burrows deeply -Accessory lobe -Placental tear	-Tear in cervix and vagina -Precipitous delivery -Macrosomic baby -Episiotomy
Presentation	PPH+Absent uterus	PPH+Boggy uterus	PPH+Firm uterus	PPH+Normal uterus
Diagnosis	Clinical (speculum shows uterus inverted to the vagina)	Clinical	Placental blood vessels go to the edge (normally BV never reach the edge)	clinical (speculum shows laceration in the cervix & vagina)
Treatment	-1st Manually - **Tocolytic** (to put uterus back in place) then use **uterine tonic** (to contract back to where it supposed to be) -Surgery	-Uterine massage -Medications: 1-Oxytocin 2-Methergine 3-Hemabate (PGF2-α) -Surgery	-D&C -if doesn't work do hysterectomy F/U: β-hCG	-Pressure (if small bleeding) -Suture (if severe bleeding)

DIC: "is a fibrin clot that's clot everywhere it's not supposed to, so there's nothing left to clot where it's need to"
fibrin clot created by consumption of platelet to form the fibrinogen mesh on the platelet plug

↓ plt → give plt
↓ Hgb → give PRBC
↓ fibrinogen → give cryoprecipitate
↑ INT → give FFP
Schistocyte

Teaching case (video case)

Tracy is a 33 year-old G1 woman who underwent **induction of labor** for a post-dates pregnancy at 41 weeks and 3 days gestation. Prostaglandins were used to accomplish cervical ripening and an **oxytocin** infusion was used to induce labor.The patient had a **lengthy first and second stage**. Ultimately, the fetus was delivered with **vacuum assistance**. The baby **weighed 9** pounds 3 oz at birth. The third stage of labor was uncomplicated. Thirty minutes later you are called to the recovery room because Tracy has experienced brisk vaginal bleeding that did not respond to uterine massage by her Nurse.

Questions :

1- What is the definition of postpartum hemorrhage?

blood loss >500 cc after vaginal delivery or >1000 cc after cesarean section

Why the blood loss in CS more than vaginal delivery ?

In CS you are cutting tissues other than the uterus.

In vaginal delivery the bleeding come from the utrs itself

2- What elements of this case present risk factors for a postpartum hemorrhage?

- Induced labor
- Prolonged labor it cause exhaustion to the uterine muscle
- Operative vaginal delivery it can cause laceration and injury
- Fetal macrosomia

3- What are other risk factors for postpartum hemorrhage?

- Grand Multiparity
- Over-distended uterus (multiples, hydramnios, fetal macrosomia)
- Augmented labor
- Prolonged labor
- Operative delivery
- Previous history of postpartum hemorrhage
- Chorioamnionitis

4- What are the causes of postpartum hemorrhage?

1. Uterine atony (most common)
2. Retained placental tissue
3. Maternal trauma/obstetric lacerations Uterine inversions
4. Maternal coagulopathy (pre-existing or acquired)

It easy to remember the causes of PPH by 4 Ts:

1. Tone (uterine atony)
2. Tissue (Retained placental tissue)
3. Truma (laceration)
4. Thrombosis (coagulopathies)

5- What is the management for postpartum hemorrhage?

1. **Prevention** (for those risk factors):
    a. Active Management of the third stage of labor
    b. Oxytocin (IV or IM) with delivery of anterior shoulder or delivery of the fetus
    c. Gentle cord traction following delivery of fetus
    d. Suprapubic support of the uterus to prevent inversion while providing cord traction.
2. **Diagnosis of PPH and Management :**
   ABC, Assess tone of uterus and management will be based on etiology :
3. **Bimanual massage**
    a. **if atony most likely** : Employ uterotonics (oxytocin, ergonovine/methylergonovine, 15-methyl prostaglandin F2α, misoprostol)
    b. **Lacerations** : suturing
    c. **retained placenta** : Manual removal or uterine curettage
4. Empty bladder, insert foley catheter for fluid monitoring
5. If uterus does not respond to these methods consider alternatives measures (intrauterine compression, surgery with compression sutures, arterial ligation, hysterectomy)
6. And blood should be transfused for any patient with PPH with1:1:1 ratio (PRBC : FFP : Platelets) .

In Management of PPH always start with **ABC** then check the **4 Ts**:

1. Tone (uterine atony_ uterotonic medication)
2. Tissue (Retained placental tissue- check the placenta then remove the placental tissue)
3. Truma (laceration- suturing)
4. Thrombosis (coagulopathies- check blood work if she has DIC then you should transfuse blood with1:1:1 ratio)