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CASE STUDY ON PPH

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ABSTRACT:

This study examines postpartum hemorrhage (PPH), as a leading cause of maternal mortality worldwide. It explores the risk factors, etiology, prevention strategies, and management approaches for PPH, emphasizing the importance of early detection and timely intervention. The study highlights medical, surgical, and interventional techniques for controlling excessive bleeding, including the use of uterotonics, balloon tamponade, and surgical procedures. Additionally, it discusses the role of healthcare systems in reducing PPH-related deaths through improved protocols, training, and resource availability. The findings underscore the need for a multidisciplinary approach to enhance maternal outcomes and minimize complications associated with PPH.

INTRODUCTION

As a part of our practice nursing, I went to the postnatal ward in KNH.. When I was posted to the postnatal ward, I took case of client by name Mrs. Ritu Negi admitted for treatment of postpartum haemorrhage. I selected this case for my case study or in order to use this knowledge in my day-to-day clinical practice.

BIODEMOGRAPHIC DATA

Name of the patient -Mrs.Ritu Negi
Age-24years
Education: Higher Secondary
Occupation: Housewife
Date of Admission-
Obstetrical score: $G_1P_1A_0L_1$
LMP:13/5/22
EDD: 20/2/22
Gestational age: 40 weeks
Diagnosis: PPD1of NVD with RMLE along withprimarypostpartum haemorrhage
Name of the hospital: KNH SHIMLA HP.
Mode of Delivery: NVD with Episiotomy
Condition of baby at birth: Baby cried immediately after the birth
Sex of the baby: Female

Husband's Name: Mr. Nitin Negi
Age: 26 years
Occupation: Private job
Monthly income: Rs. 20,000/-

CONDITION ON ADMISSION:

General condition:
Temperature: 102°F
Pulse: 78 bpm
Respiration: 24 bpm
Blood Pressure: 100/60 mmhg
Nutritional status: Malnourished
Hydration: dehydrated
Signs of any complication: Anemia, and severe bleeding
Chief complaints on admission:Bleeding more than one liter as evidenced by soaked number of pads within 24 hours of baby birth.

HISTORY COLLECTION

Present and past medical and surgical history:
PAST MEDICAL HISTORY: Nothing Significant
PAST SURGICAL HISTORY :Nothing significant
PRESENT MEDICAL HISTORY :Nothing Significant .
PRESENT SURGICAL HISTORY Nothing Significant except Episiotomy

Family history
Total no. of family members: 5
History of consanguinity: No
Hereditary diseases: No
Socio economic status: Upper middle-class family
Monthly income: 20-30 thousand per month

Personal history

Diet: Non-vegetarian
Habits: No habits of smoking cigarettes or alcohol is present
Physical activity: mild to moderate as performing house-hold work.
Rest and sleep: 6-8hours at night and 2-3hours at daytime
Bowel and bladder: Normal bowel and bladder habits
Cultural practices after birth: No harmful cultural practice after child birth is present
Personal hygiene: maintained
Drug history: taking prescribed medications only H/o any Allergies: No such history evident
Contraceptive: No H/O any contraceptive usage

Menstural history

Menarche: at 14 years of age.
Cycle & duration: 28-32 days for 4-5 days/ Regular/ Average flow
Dysmenorrhea: Absent

Marital history

Married at the age of: 22 years
Duration of marital life: 2years
Spouse health: healthy and maintained

Evidence by physical and mental health

Present obstetrical history:

Antenatal history:

a) Immunization and supplementation: Inj. TT 2 doses received along with iron and folic acid supplements.
b) Minor ailments during pregnancy: Back ache, cramps
c) Complications during pregnancy if any: No
d) Weight gain during pregnancy: 11.5 kg
e) If any other: No

Intranatal history:

Onset of labour pain: 9:00 am on 10/2/2022
Time of full dilatation of cervix: 10:12 pm
Rupture of membrane: spontaneous / artificial
Mode of delivery: NVD with Right mediolateral episiotomy
Episiotomy: Yes
Date and time of delivery of baby: 10/2/2022 at 10:58 pm

Placenta delivered at: 11:16 pm
Completeness of placenta and membranes: Present
Gender of the baby: Male
APGAR Score: 1st min- 8/10 5th min- 9/10
Condition of baby at birth: Healthy
Birth weight: 2.6 kg

Obstetrical examination:

Inspection: Patient looking pale
Palpation of uterus: Uterus is soft and tender.
Fundal height – 15 cm, sub involuted.
(Consistency, shape and descent)
Per vaginal inspection / examination:
Vulval edema: Nil
Vagina: Bleeding present (>1 L)
Perineal area / anus: Intact
(Intact, lacerations or hemorrhoids, any pain)
Inspect REEDA for episiotomy wound: Wound is redness and edematous.
(Redness, edema, ecchymosis, discharge and apposition)
Color and amount of lochia odour: Lochia rubra present
Any complaints:Excessive bleeding and lethargic

Laboratory reports:

Blood group: B
Rh: Positive
VDRL: Negative
PPBS:Not done
Fasting: 71 mg/dl
Hb%: 11.4 gm/dl
Others: TSH :1.74mcg/dl

Urine: Sugar: Nil Albumin: Nil

USG report: Single living fetus, liquor –adequate, Placenta – posterior.

Delivery notes (from records): Normal delivery with mediolateral episiotomy done. A full-term living baby boy was born on 10/2/2022 at 10.58 pm. Inj oxytocin 10 IU given.

Total duration of labor: 13 hours

Removal of placenta:Manual

Treatment:
Cap Amoxycillin 500 mg 1 cap TDS,
Tab Trenexa,
Tab metrogyl,
Tab cefotaxime.

Received of mother at post-natal ward at 11am on 11/2/2022.

HEAD TO FOOT EXAMINATION

• Skin colour: Pale • Posture: Erect • Gait: Normal • Bleeding: Present • Discharge: Absent	**HEAD:** Scalp: Normal (No scars) -No lesions, Dandruff, Lice present.
EYES: • Eyebrows: Normal, Black	**MOUTH:** • Lips: Pinkish & moist

• Eyelids: Normal • Eyelashes: Normally distributed • Sclera: Pale • Conjunctiva: Pale • Pupil: Round and reactive to light • Vision: Normal visual acquity • Any Abnormalities: Not present	• Gums: Normal, Pinkish • Teeth: Normal, well distributed • Tongue: Pinkish • Oral Mucosa: Pinkish and hygienic • Any other observation: -No-
EARS: • Hearing: Normal hearing acquity • Discharges: Absent • Pain: Not present • Cerumen: Present • Any Abnormalities: No	**NOSE:** • Nasal Septum: Medial • Nasal Polyps: Absent • Discharges/ Epistaxis: Absent • Any Abnormalities: No
THROAT: • Inflammation: Absent • Pus: Not present • Any other observation: No	**NECK:** • Inspection: Neck is long • Palpation: Thyroid & Cervical Lymph Nodes: -No palpable lymph nodes is present. • Any other observation: No
CHEST • Shape: Normal, No Bulging • Breast: No tenderness, No lesions Inspection • Symmetry: Symmetrical • Skin: Pale • Nipple: Normal Palpation • Mass: Absent • Axillary Lymph Nodes: Absent • Discharges From Nipple: Absent	**ABDOMEN:** Inspection • Colour: Normal skin colour • Distension: Absent • Peristaltic movement: Not heard • Scar Present: No Palpation • Hernia: Not present • Organomegaly: Spleen and liver are not enlarged. • Tenderness: Absent • Any Abnormalities: -No-
BACK: Inspection • Colour: Pale • Lesions: Absent • Shape of Vertebral Column: S-shaped • Curvature & Growth: Lumbar and Cervical curvature are present. • Any other observation: No Palpation • Tenderness: Absent	**EXTREMITIES:** • Symmetry: Bilateral Symmetry present • Colour: Pinkish • Muscle strength & Tone: Normal • Any Abnormalities: Not present
SKIN: Dry	

REVIEW OF PHYSIOLOGICAL SYSTEM/SYSTEMIC EXAMINATION

Subjective data	Objective data
Head: • Scalp normal. • Hair black.	✓ No any abnormality seen. ✓ Normal shape, scalp & hair distribution.
Vision:	✓ Visual acquity and visual field is normal. ✓ No pain and discharge.
Hearing:	✓ Hearing acquity is normal.
Speech & orientation	✓ Stammering and stuttering is absent. ✓ Well oriented to time, place and person.
Respiratory system:	**On inspection:** Bilateral air entry is equal. **On palpation:** No tenderness and no any abnormal mass present. **On percussion:** No fluid accumulation.

	On auscultation: Normal bronchial sound heard (Resonance).
Circulatory system:	Pulse:72 bpm Blood pressure: 100/60 mmhg **On inspection:** Skin colour is pale, no lesion and no scar. **On palpation:** - Peripheral pulse- Present, normal (72bpm) - Capillary refilling- <3 seconds, Present - Quality of peripheral pulse: Regular with equal intervals **On auscultation:** - Normal S1 and S2 sound heard.
Lymphatic system:	✓ Lymph nodes not palpable
Gastrointestinal system and nutrition/hydration:	**On inspection:** Normal skin colour & temperature. **On auscultation:** Bowel sounds not heard. **On palpation:** No fluid/air accumulated. No tenderness, no mass. **On percussion:** Normal dull sound present.
Urinary system:	- **Urine colour:** Straw colour, normal - **Amount:** 700-1000 ml/day - **Appearance of urine:** Turbid, No colour change.
Reproductive system:	✓ External genitalia normal.
Integumentary system:	✓ Skin colour, temperature and integrity normal. ✓ No rashes, itching, pustule and papule is present.
Rest and sleep:	✓ Patient is taking adequate rest and sleep (7-8 hours/day).
Psycho-social aspect:	✓ Sharing good relationship with husband, family members and society.
Musculo skeleton system:	✓ No abnormal findings. ✓ Muscle strength is normal.
Neurological system:	**Level of consciousness:** ✓ Normal Glasgow coma scale reading: 15 **($E_4V_5M_6$)** **Memory:** Intact
Motor function: **Sensory function:**	**CO-ORDINATION:** **a. Finger to nose**: Well coordinated **b. Pronation supination**: well coordinated **c. Heel-Knee Test**: Normal & cooordinated well **d. Gait**: Normal **e. Postural adjustment**: Adjusting normally. No abnormality **BALANCE:** **A. Romberg test**: Negative (Balanced, maintained coordination) **B. Tendom walking**: Normal

POST-PARTUM ASSESSMENT

ASSESSMENT OF NEW-BORN

Condition of the newborn: Good, posture-flexed, wellcried, alert

Vital signs:

Colour of skin: Pink

Texture - soft smooth. Dryness over hands and feet. Goodturgor. Vernix present.

Heart rate (Apex bit):138 beats/ min

Respiration :40 breaths/ min

Physical measurement:

Weight:2.6 kg

Length :49 cm

Head circumference :34 cm

Chest circumference :31 cm

Head to foot examination:

Examination of head:

Fontanelles/sutures/caput: Anterior fontanellediamondshaped, 2.5X3cm. No overriding of suture

No moulding.

Face: Normal

Eyes Clean and healthy. Sclera –white, iris – dark gray

Ears: Top of the pinna of ears is in a horizontal plane to the outer cantus.

Pinna is firm, cartilage felt along with edge. Instantrecoil.

Nose: Nasal passage is patent

Mouth: No precocious teeth, no Epsteinpearl, uvula in midline. No cleft lip or cleft palate.

Neck: Short. No gland is palpable.

Limbs and digits: 10 fingers of hands and toes each. Palmer creases present over 1/3rdportion.

Chests: Clear.

Breast: Breast tissue is more than 10 mm. Areola raised.

Abdomen: Soft. No palpable mass.

Umbilical cord: Umbilical cord is clean and no bleeding .2 arteries and 1 vein present.

Genitalia: Labia majora well developed and completely cover the labia minora. No discharge

: Urethral meatus is located above the vaginal orifice.

Anus: Patent.

Spine/back: Normal.

Hips (Ortolani's test): No hip dislocation.

Legs: 10 fingers of toes and sole creases present over a 1/3rdportion.

Reflexes:

Grasp: Present.

Moro: Present.

Glabellar: Present.

Rooting: Present.

Sucking: Present.

Planter and Babinski:Present.

Muscle activity: Normal.

Urine: Passed.

Meconium: Passed.

General impression: Baby is normal.

NEWBORN RELEXES

S.NO.	REFLEXES	BABY'S RESPONSE
1.	Head:	
	➢ Glabellarreflex	Blinked his both eyes
	➢ Head lag reflex	Head lags behind

2.	Eyes:	
	➢ Blinking	Blinked his both eyes
	➢ Corneal reflex	Blinked his both eyes
	➢ Papillary reflex	Constricted pupil on light stimulus
	➢ Doll's eyereflex	Eyes remained stationary when head moves to one side
3.	Nose:	
	➢ Sneezing reflex	Sneeze when irritated
4.	Mouth:	
	➢ Rooting	Open wide mouth towards tapping side
	➢ Sucking	Sucks breast milk
	➢ Swallowing	Swallow milk and coordinated with sucking
	➢ Extrusion &gag reflex	Protrude tongue out
	➢ Dolls reflux	Not assessed
5.	Neck:	
	➢ Tonic neckreflex	Left arm and leg extends when head turn towards right side
6.	Extremities:	
	➢ Palmer	Grasp my finger tightly
	➢ Planter	Fanning
	➢ Babinski	Fanning of finger
	➢ Stepping	Moves feet as if to work dance

MECONIUM- Passed

UMBLICAL CORD- No oozing of blood, clean and dry. **IMMUNIZATION STATUS-** BCG, hepatitis B and OPV given at birth.
BATH/SPONGING- Not given.

INVESTIGATIONS

S.No.	Investigation	Patient value	Reference value
1	Hemoglobin	9.8 g/dl	12-15 g/dl
2	RBC	4.39* 10^6 u/l	4- 5.4* 10^6 u/l
3	WBC	14.11* 10^3 u/l	5- 10* 10^3 u/l
4	Neutrophils	84.2%	40- 70%
5	Lymphocytes	10.1 %	5-10%
6	Monocytes	5.3%	2-10%
7	Eosinophils	0.3%	0- 0.6%
8	Basophils	0.1%	0.1-0.3%
9	Platelets	1.7 lakhs cells/mm^3	1.5 – 4 lakhs cells/mm^3

10	HCT	43.9%	35- 37%
11	MCV	100.1 fl	80-100 fl
12	MCH	33.8 pg	27- 33 pg
13	MCHC	33.8 pg	32- 37 pg
14	Prothrombin time	9.4 seconds	10-13 seconds
15	aPTT	28 seconds	25- 36 seconds
16	Total bilirubin	0.59 mg/dl	0.3- 1.2 mg/dl
17	Direct bilirubin	0.07 mg/dl	0-0.2 mg/dl
18	SGPT	18.0 u/l	0-35 u/l
19	SGOT	41.0 u/l	4-40 u/l
20	ALP	233 u/l	30-120 u/l
21	GGT	5 u/l	0-38 u/l
22	Serum total protein	6.9 g/dl	6.6-8.3 g/dl
23	Albumin	3.69 g/dl	3.5- 5.2 g/dl
24	Globuli	3.21 g/dl	2.5- 3.2 g/dl
25	A/G ratio	1.15	1.1-2.1
26	Plasma glucose (fasting)	76 mg/dl	70-106 mg/dl
27	TSH	1.74 u/l	0.35- 5.5 u/l
28	HIV	NR	NR
29	HbsAg	NR	NR

DISEASE CONDITION

DEFINITION:

Quantitative definition is arbitrary and is related to the amount of blood loss in excess of 500 mL following birth of the baby **(WHO).** It may be useful for statistical purposes. As the effect of the blood loss is important rather than the amount of blood lost, the clinical definition, which is more practical states, "any amount of bleeding from or into the genital tract following birth of the baby up to the end of the puerperium, which adversely affects the general condition of the patient evidenced by rise in pulse rate and falling blood pressure is called postpartum hemorrhage".
The average blood loss following vaginal delivery, cesarean delivery and cesarean hysterectomy is 500 mL, 1000 mL and 1500 mL respectively.
Depending upon the amount of blood loss, PPH can be ♦ Minor (< 1L), ♦ Major (> 1L) or ♦ Severe (> 2L).
INCIDENCE: The incidence widely varies mainly because of lack of uniformity in the criteria used in definition. The incidence is about 4–6% of all deliveries.

TYPES:

- ✓ Primary
- ✓ Secondary
- ✓ Primary: Hemorrhage occurs within 24 hours following the birth of the baby. In the majority, hemorrhage occurs within two hours following delivery. These are of two types: Third stage hemorrhage—Bleeding occurs before expulsion of placenta. True postpartum hemorrhage—Bleeding occurs subsequent to expulsion of placenta (majority). Secondary: Hemorrhage occurs beyond 24 hours and within puerperium, also called delayed or late puerperal hemorrhage.

PRIMARY POSTPARTUM HEMORRHAGE (PPH)

CAUSES OF PRIMARY PPH:-Four basic pathologies are expressed as the **four Ts'** (RCOG): **Tone** (atonicity), **Tissue** (retained bits, blood clots), **Trauma** (genital tract injury) and **Thrombin** (coagulopathy).

♦ Atonic

♦ Traumatic

♦ Retained tissues

♦ Blood coagulopathy (Thrombin)

Atonic uterus (80%): Atonicity of the uterus is the commonest cause of postpartum hemorrhage. With the separation of the placenta, the uterine sinuses, which are torn, cannot be compressed effectively due to imperfect contraction and retraction of the uterine musculature and bleeding continues.

The following are the conditions, which often interfere with the retraction of the uterus as a whole and of the placental site in particular. — Grand multipara—Inadequate retraction and frequent adherent placenta contribute to it. Associated anemia may also probably play a role. — Overdistension of the uterus as in multiple pregnancy, hydramnios and big baby (>4 kg). Imperfect retraction and a large placental site are responsible for excessive bleeding. — Malnutrition and anemia (12 hours): Poor retraction, infection (amnionitis), dehydration are important factors (Tone). — Anesthesia: Depth of anesthesia and the anesthetic agents (ether, halothane) may cause atonicity. — Initiation or augmentation of delivery by oxytocin: Postdelivery uterine atonicity is likely unless the oxytocin is continued for at least one hour following delivery. —
— Malformation of the uterus: Implantation of the placenta in the uterine septum of a septate uterus or in the cornual region of a bicornuate uterus may cause excessive bleeding. — Uterine fibroid causes imperfect retraction mechanically. — Mismanaged third stage of labor: This includes—(a) Too rapid delivery of the baby preventing the uterine wall to adapt to the diminishing contents, (b) Premature attempt to deliver the placenta before it is separated, (c) Kneading and fiddling the uterus, (d) Pulling the cord. All these produce irregular uterine contractions leading to partial separation of placenta and hemorrhage, (e) Manual separation of the placenta increases blood loss during cesarean delivery. — Placenta: Morbidly adherent (accreta, percreta), partially or completely separated and/or retained cause PPH.

— Precipitate labor: In rapid delivery, separation of the placenta occurs following the birth of the baby. Bleeding continues before the onset of uterine retraction. Bleeding may be due to genital tract trauma also

Traumatic (20%): Trauma to the genital tract usually occurs following operative delivery; even after spontaneous delivery. Blood loss from the episiotomy wound is often underestimated. Similarly, blood loss in cesarean section amounting to 800–1000 mL is most often ignored. Trauma involves usually the cervix, vagina, perineum (episiotomy wound and lacerations), paraurethral region and rarely, rupture of the uterus occurs. The bleeding is usually revealed but can rarely be concealed (vulvovaginal or broad ligament hematoma).

Retained tissues: Bits of placenta, blood clots cause PPH due to imperfect uterine retraction.

Combination of atonic and traumatic causes.

Thrombin: Blood coagulation disorders, acquired or congenital, are less common causes of postpartum hemorrhage. The blood coagulopathy may be due to diminished procoagulants (washout phenomenon) or increased fibrinolytic activity. The firmly retracted uterus can usually prevent bleeding. The conditions where such disorders may occur are abruptio placentae, jaundice in pregnancy, thrombocytopenic purpura, severe preeclampsia, HELLP syndrome or in IUD

DIAGNOSIS AND CLINICAL EFFECTS: In the majority, the vaginal bleeding is visible outside, as a slow trickle. Rarely, the bleeding is totally concealed as either vulvovaginal or broad ligament hematoma. The effect of blood loss depends on—
(a) Predelivery hemoglobin level,
(b) degree of pregnancy induced hypervolemia and
(c) speed at which blood loss occurs.

PROGNOSIS: Postpartum hemorrhage is one of the life-threatening emergencies. It is one of the major causes of maternal deaths both in the developing and developed countries. Prevalence of malnutrition and anemia, inadequate antenatal and intranatal care and lack of blood transfusion facilities, substandard care are some of the important contributing factors. There is also increased morbidity.These include shock, transfusion reaction, puerperal sepsis, failing lactation, pulmonary embolism, thrombosis and thrombophlebitis. Late sequelae include Sheehan's syndrome (selective hypopituitarism) or rarely diabetes insipidus.

PREVENTION

Postpartum hemorrhage cannot always be prevented. However, the incidence and especially its magnitude can be reduced substantially by assessing the risk factors and following the guidelines as mentioned below: However, most cases of PPH have no identifiable risk factors.

Antenatal

- ✓ Improvement of the health status of the woman and to keep the hemoglobin level normal (⎛Antenatal > ⎞ All women with prior cesarean delivery must have their placental site determined by ultrasound/MRI to determine morbid adherent placenta.
- ✓ Blood grouping should be done for all women so that no time is wasted during emergency.
- ✓ High-risk patients who are likely to develop postpartum hemorrhage (such as twins, hydramnios, grand multipara, APH, history of previous PPH, severe anemia) are to be screened and delivered in a well-equipped hospital.
- ✓ 10 g/dL) so that the patient can withstand some amount of the blood loss.
- ✓ Women with morbid adherent placenta are at high risk of PPH. Such a case should be delivered by a senior obstetrician. Availability of

blood and or blood products must be ensured beforehand. Multidisciplinary team approach should be made in such a case.

ν Intranatal

- ✓ Active management of the third stage, for all women in labor should be a routine as it reduces PPH by 60%.
- ✓ Exploration of the uterovaginal canal for evidence of trauma following difficult labor or instrumental delivery.
- ✓ Observation for about two hours after delivery to make sure that the uterus is hard and well contracted before sending her to ward.
- ✓ Expert obstetric anesthetist is needed when the delivery is conducted under general anesthesia. Local or epidural anesthesia is preferable to general anesthesia, in forceps, ventouse or breech delivery.
- ✓ During cesarean section spontaneous separation and delivery of the placenta reduces blood loss (30%).
- ✓ Examination of the placenta and membranes should be a routine to detect at the earliest any missing part.

All said and done, it is the intelligent anticipation, skilled supervision, prompt detection and effective institution of therapy that can prevent a normal case from undergoing disastrous consequences.

MANAGEMENT OF TRUE POSTPARTUM HEMORRHAGE

PRINCIPLES: Simultaneous approach

- o Communication
- o Resuscitation
- o Monitoring
- o Arrest of bleeding It is essential in all cases of major PPH (blood loss > 1000 mL or clinical shock). (RCOG - 2009).

MANAGEMENT

- ❖ Immediate measures are to be taken by the attending house officer (doctor/midwife).
  - o Call for extra help—involve the obstetric registrar (senior staff) on call.
  - o Put in two large bore (14-gauge) intravenous cannulas.
  - o Keep patient flat and warm.
  - o Send blood for full blood count, group, cross matching, diagnostic tests (RFT, LFT), coagulation screen including fibrinogen and ask for 2 units (at least) of blood.
  - o Infuse rapidly 2 liters of normal saline (crystalloids) or plasma substitutes like Haemaccel (colloids), an urea-linked gelatin, to reexpand the vascular bed. It does not interfere with cross matching.
  - o Give oxygen by mask 10–15 L/min.
  - o Start 20 units of oxytocin in 1 L of normal saline IV at the rate of 60 drops per minute. Transfuse blood as soon as possible.
  - o One midwife/rotating houseman should be assigned to monitor the following—(i) Pulse (ii) Blood pressure (iii) Temperature (iv) Respiratory rate and oximeter (v) Type and amount of fluids (blood, blood products) the patient has received (vi) Urine output (continuous catheterization) (vii) Drugs-type, dose and time (viii) Central venous pressure (when sited).

ACTUAL MANAGEMENT:

The first step is to control the fundus and to note the feel of the uterus. If the uterus is flabby, the bleeding is likely to be from the atonic uterus. If the uterus is firm and contracted, the bleeding is likely of traumatic origin.

Atonic uterus:

Step—I:

(a) Massage the uterus to make it hard and express the blood clot,

(b) Methergine 0.2 mg is given intravenously,

(c) Injection oxytocin drip is started (10 units in 500 mL of normal saline) at the rate of 40–60 drops per minute,

(d) Foley catheter to keep bladder empty and to monitor urine output,

(e) To examine the expelled placenta and membranes, for evidence of missing cotyledon or piece of membranes. If the uterus fails to contract, proceed to the next step.

Step—II: The uterus is to be explored under general anesthesia. Simultaneous inspection of the cervix, vagina especially the paraurethral region is to be done to exclude coexistent bleeding sites from the injured area.

Step—III: Uterine massage and bimanual compression.

Procedures:

(a) The whole hand is introduced into the vagina in cone shaped fashion after separating the labia with the fingers of the other hand,

(b) The vaginal hand is clenched into a fist with the back of the hand directed posteriorly and the knuckles in the anterior fornix,

(c) The other hand is placed over the abdomen behind the uterus to make it anteverted,

(d) The uterus is firmly squeezed between the two hands. It may be necessary to continue the compression for a prolonged period until the tone of the uterus is regained. This is evidenced by absence of bleeding if the compression is released.

During the period, the resuscitative measures are to be continued. If, in spite of therapy, the uterus remains refractory and the bleeding continues, the possibility of blood coagulation disorders should be kept in mind and massive fresh whole blood transfusion should be given until specific measures can be employed.

Step—IV: Uterine tamponade— (a) Tight intrauterine packing is done uniformal under general anesthesia.

Procedure: A 5 meters long strip of gauze, 8 cm wide folded twice is required. The gauze should be soaked in antiseptic cream before introduction. The gauze is placed high up and packed into the fundal area first while the uterus is steadied by the external hand.

Gradually, the rest of the cavity is packed so that no empty space is left behind. A separate pack is used to fill the vagina. An abdominal binder is placed. Intrauterine plugging acts not only by stimulating uterine contraction but exerts direct hemostatic pressure (tamponade effect) to the open uterine sinuses. Antibiotic should be given and the plug should be removed after 24 hours. Intrauterine packing is useful in a case of uncontrolled postpartum hemorrhage where other methods have failed and the patient is being prepared for transport to a tertiary care center. (b) Balloon tamponade: Tamponade using various types of hydrostatic balloon catheter has mostly replaced uterine packing. Mechanism of action is similar to uterine packing. Foley catheter, Bakri balloon, Condom catheter or Sengstaken-Blakemore tube is inserted into the uterine cavity and the balloon is inflated with normal saline (200–500 mL). It is kept for 4–6 hours. It is successful in atonic PPH. This can avoid hysterectomy in 78% cases. It is considered the first line surgical intervention for most women with atonic PPH.

Other Measures:

A non-pneumatic antishock garment may be used when patient is being transferred to a referral center.

Compression of the abdominal aorta may be a temporary but effective measure. This allows time for resuscitation and volume replacement before any surgical intervention is done.

Step V: Surgical methods to control PPH are many. An outline of stepwise uterine devascularization procedures are given below:

(a) B-Lynch compression suture (1997) and multiple square sutures: Both these surgical methods work by tamponade (like bimanual compression) of the uterus.

Success rate is about 80% and it can avoid hysterectomy. (b) Ligation of uterine arteries—the ascending branch of the uterine artery is ligated at the lateral border between upper and lower uterine segment. The suture (No. 1 chromic) is passed into the myometrium 2 cm medial to the artery. In atonic hemorrhage, bilateral ligation is effective in about 75% of cases.

(c) Ligation of the ovarian and uterine artery anastomosis, if bleeding continues, is done just below the ovarian ligament. Rarely temporary occlusion of the ovarian vessels at the infundibulopelvic ligament may be done by rubber-sleeved clamps.

(d) Ligation of anterior division of internal iliac artery (unilateral or bilateral)—reduces the distal blood flow. It helps stable clot formation by reducing the pulse pressure up to 85%. Due to extensive collateral circulation, there is no pelvic tissue necrosis. Bilateral ligation (not division) can avoid hysterectomy in about 50% of the cases.

(e) Angiographic selective arterial embolization (bleeding vessel) under fluoroscopy (interventional radiology) can be done using gel foam. Success rate is more than 90% and it avoids hysterectomy.

Step VI: Hysterectomy—rarely uterus fails to contract and bleeding continues in spite of the above measures. Hysterectomy has to be considered involving a second consultant. Decision of hysterectomy should be taken earlier in a parous woman.

Depending on the case, it may be subtotal or total.

Traumatic PPH: The trauma to the perineum, vagina and the cervix is to be searched under good light by speculum examination and hemostasis is achieved by appropriate catgut sutures. The repair is done under general anesthesia, if necessary. Skill drill for management of PPH management for all birth attendants is essential to improve outcome. Documentation of all measures adopted in respect of time should be done.

TREAMENT :

S.No.	Drug	Dose/ Route	Action	indication	Side-effects	Contra indication	Nurse's responsibility
1.	cefotaxime	1 gm IV BD	Bacterial agent that acts by inhibition of bacterial cell wall synthesis . It has activity in the presence of	Respiratory tract infection Bacteremia Septicemia Other infection	Rashes Itching Nausea Vomiting Fever	Hypersensitivity . Renal disease. coagulopathy	Timely administration of drugs. Observe for side-effects.

			beta lactamase.				Check for any infection or IV infiltration.
2.	Tranexa	1 gm IV BD	Slow down the breakdown of blood clots which helps to prevent prolonged bleeding.	Bleeding Surgery Total knee replacement Renal impairment.	Color vision Sudden numbness or weakness Sudden chest pain.	Color vision Sudden numbness hypersensitivity	Monitor the drug dosage and frequency.
3.	Vitamin K	1 mg IM At birth	It is needed for blood clotting. It activate the blood clotting factors 2, 7, 9 and 10.	Hemorrhage disease Bleeding disease Vitamin K dependency clotting.	Anaphylax is Flushing Dizziness	hypersensitivity	Document the giving medication. Observe for bleeding. Observe for jaundice.