Overview of postpartum care

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INTRODUCTION

- The postpartum period, also known as the puerperium,
- Begins with the delivery of the baby and placenta.
- The end of the postpartum period is less well-defined, but is often considered the six to eight weeks after delivery
  - The effects of pregnancy on many systems have resolved by this time.
  - However, not all organ systems do not return to baseline within this period and the return to baseline is not necessarily linear over time.
- Medical and psychological needs of the postpartum mother
  - Sensitive cultural differences.

DELIVERY ROOM

- Routine delivery room care should be tailored to fit individual circumstances.
- In the absence of maternal or neonatal complications, early interaction between the mother and her infant should be encouraged.
- Skin-to-skin contact improves infant thermal regulation and maximizes maternal-infant attachment.
  - Early initiation of breastfeeding is possible and desirable in women undergoing cesarean delivery, as soon as the surgery has been completed.
- The benefits of skin-to-skin contact at birth
  - Infants are more likely to be breastfeeding at one and four months after delivery
  - longer overall breastfeeding duration than those receiving usual care.
  - It maintains glucose levels better than others.
  - Thermal stability was significantly improved in late preterm infants, but the improvement was not clinically significant in full term infants.

NORMAL POSTPARTUM ANATOMIC AND PHYSIOLOGIC CHANGES

Shivering

- Observed in 25 to 50 percent of women after normal deliveries .
- Shivering usually starts 1 to 30 minutes post-delivery and lasts for 2 to 60 minutes.
- The pathogenesis of postpartum chills is not clear; several mechanisms have been proposed including
  - Fetal-maternal hemorrhage,
  - Micro-amniotic emboli,
  - Bacteremia,
  - Maternal thermogenic reaction to a sudden thermal imbalance due to the separation of the placenta,
  - Drop in body temperature following labor,
  - Anesthesia-related etiology.
- No treatment is necessary other than supportive care (eg, warm blanket).

Uterine Involution

- Immediately after delivery of the placenta, the uterus begins to involute (ie, contract).
- Myometrial retraction is a unique characteristic of the uterine muscle.
- Contraction of the interlacing myometrial muscle bundles constricts the intramyometrial vessels and impedes blood flow, which is the major mechanism preventing hemorrhage.
- In addition, large vessels at the placental site thrombose, which is a secondary hemostatic mechanism for preventing blood loss at this site.

- On examination, the fundus should be
  - Nontender,
  - Firm,
  - More globular than in its pregnant state.
- A soft, boggy uterus in the presence of heavy vaginal bleeding suggests inadequate contraction of the uterus (ie, atony).
- The uterine fundus is located
  - Near the umbilicus within 24 hours after delivery,
  - Midway between the symphysis pubis and umbilicus within one week postpartum,
  - Not palpable abdominally after 12 days postpartum,
  - Normal nonpregnant size by six to eight weeks postpartum.
- This process is affected by parity and mode of delivery
  - Multiparous women
  - Post cesarean delivery,
  - Breastfeeding

Lochia

- The basal portion of the decidua remains after the placenta separates.
- This decidua divides into two layers:
  - Superficial layer is shed
  - Deep layer regenerates new endometrium, which covers the entire endometrial cavity by the 16th postpartum day
- Normal shedding of blood and decidua is referred to as *lochia rubra* (red, red brown), and lasts for the first few days following delivery.
- Vaginal discharge then becomes increasingly watery, called *lochia serosa* (pinkish brown), which lasts for two to three weeks.
- Ultimately, the discharge turns yellowish-white, the *lochia alba*.
- The total volume of postpartum lochial secretion is 200 to 500 mL over a mean duration of just over one month.

Ultrasound of the involuting uterus

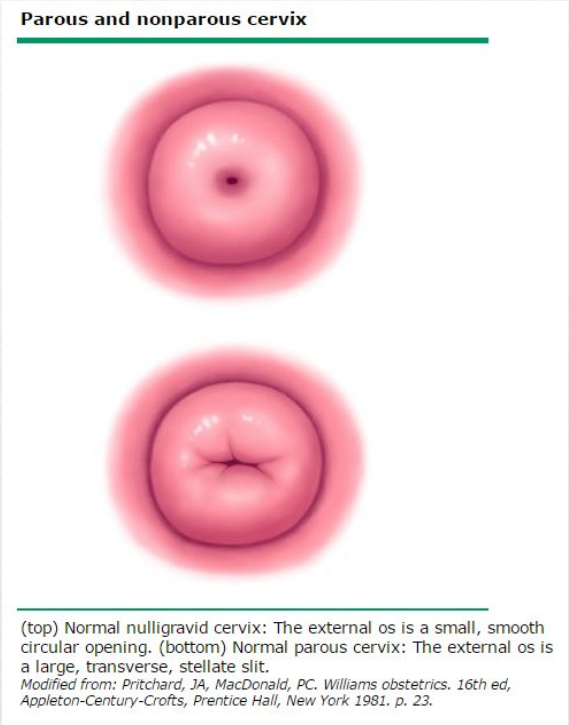
- The uterus is most often empty in the early puerperium (days 1 and 3);
- Fluid and debris are seen in the entire cavity in the middle part of the puerperium (day 14)
- The late puerperium (days 28 and 56) was characterized by an empty cavity which appeared as a thin white line.

- Endometrial gas was occasionally visualized.
  - Gas may also be visualized in the uterine cavity after cesarean delivery or after manual evacuation of the placenta

- Echogenic material is normally seen in the uterus 48 hours after delivery.
  - *The presence of echogenic material need not change clinical management in patients who do not have heavy bleeding or signs of uterine infection.*
- However, an echogenic mass could represent retained products of conception and be associated with an increased risk of postpartum hemorrhage.

Cervix

- After delivery, the cervix is soft and floppy and there are small lacerations at the margins of the external os, which remains dilated.
- The cervix contracts slowly, remaining two to three centimeters dilated for the first few postpartum days,
- Less than 1 centimeter dilated at one week.
- The external os never resumes its pregravid shape; the small, smooth, regular circular opening of the nulligravida becomes a large, transverse, stellate slit after childbirth.
- Histologically, the cervix does not return to baseline for up to three to four months after delivery.



(top) Normal nulligravid cervix: The external os is a small, smooth circular opening. (bottom) Normal parous cervix: The external os is a large, transverse, stellate slit.
Modified from: Pritchard, JA, MacDonald, PC. Williams obstetrics. 16th ed, Appleton-Century-Crofts, Prentice Hall, New York 1981. p. 23.

Vagina and vulva

- The vagina is capacious and smooth immediately after delivery.
- It slowly contracts, but not to its nulligravid size;
- Rugae are restored in the third week as edema and vascularity subside.
- The hymen is replaced by multiple tags of tissue called the carunculae hymenales (myrtiformes).
- Fascial stretching and trauma during childbirth result in pelvic muscle relaxation, which may not return to the pregravid state.

Abdominal wall

- The abdominal wall is lax postpartum
- Regains most, if not all, of its normal muscular tone over several weeks;
- Diastasis recti may persist.
- Long-term sequelae may include
  - Low back pain,
  - Abdominal discomfort,
  - Cosmetic issues.

Reproductive Hormones

- HCG values typically return to normal nonpregnant levels two to four weeks after term delivery, but can take longer.
- The median time of elimination of the beta-subunit of human chorionic gonadotropin (hCG) was 12 days in pregnant women who underwent peripartum hysterectomy.
- The most serious concern in women with rising hCG levels postpartum is gestational trophoblastic disease.
- Gonadotropins and sex steroids are at low levels for the first two to three weeks postpartum.
- In non lactating women:
  - Return of menstruation following delivery ranges from 45 to 64 days postpartum
  - Time to ovulation ranged from 45 to 94 days,
- 70 percent of women will menstruate by the 12th postpartum week
- Women who breastfeed have a delay in resumption of ovulation postpartum.
  - This is believed to be due to prolactin-induced inhibition of pulsatile gonadotropin-releasing hormone release from the hypothalamus.

Breasts

- Human milk is recognized as the optimal feeding for all infants because of its proven health benefits to infants and their mothers
- skin-to-skin contact
- ***Positioning***
- ***Latch-on***
  - the formation of a tight seal of the infant's lips around the nipple and a sufficient portion of contiguous mammary tissue, which allows efficient removal of milk during nursing.

Skin and hair

- Striae,
  - Fade from red to silvery, but are permanent.
- The abdominal skin
  - May remain lax if there was extensive rupture of elastic fibers.
- Chloasma
  - Resolves in the postpartum period, although the exact timing is not known.
- During pregnancy, there is an increase in the percentage of "growing" or anagen hair relative to the "resting" or telogen hair.
  - This ratio is reversed in the puerperium.
  - Telogen effluvium is the hair loss commonly noted one to five months after delivery.
  - This is usually self-limited with restoration of normal hair patterns by 6 to 15 months after delivery.

Weight loss

- The mean weight loss from delivery of the fetus, placenta, and amniotic fluid is around 6 kgs.
- Further loss of 2-7 kgs is due to:
  - Involution of the uterus
  - Loss of lochial fluid and
  - Loss of intra- and extra-cellular fluid leads to

Maternal monitoring

- Temperature,
- Blood pressure,
- Heart rate,
- Respiratory rate
- Examined for evidence of uterine atony,
- Excessive vaginal bleeding
- Signs of internal hemorrhage.
  - After a vaginal birth
    - Lacerated vessel with bleeding into a pelvic hematoma, or a
    - Ruptured uterus.
  - After a cesarean delivery,
    - Bleeding from lacerations
    - Surgical incisions.
- Signs of an over-distended bladder (a distended bladder is palpable abdominally)
- Dyspnea/pleuritic pain, which could be related to a pulmonary embolus.
- The perineum should be observed for signs of edema, pain, purulent discharge, or dehiscence.

Perineal care

- Stool softeners and laxatives, as needed, are probably useful until perineal healing is nearly complete, especially in women with a disrupted anal sphincter.
- Good perineal hygiene
- Pelvic muscle exercises may be helpful in strengthening the pelvic floor muscles.

Laboratory testing

- **Hemoglubin:**
- The routine evaluation of hemoglobin is probably unwarranted in the uncomplicated, stable patient.
- Determination of hemoglobin after delivery is indicated in
  - Predelivery anemia
  - Hemorrhage.
- **White cell count:**
- Determination of the white blood cell count is not predictive of impending infection since leukocytosis is common
- Laboratory assessment should be reserved for patients in whom there is a clinical suspicion of infection

Prevention of venous thrombosis

- Thromboembolic events are the leading cause of direct maternal mortality in many developed countries.
- VTE is 21 to 84 times more common in postpartum women than in non-pregnant women
- It is more common in each postpartum day compared with each antepartum day,
- More common after cesarean than after vaginal delivery

- The highest risk is in the first two weeks postpartum,
- Gradually declines to near baseline levels in most women over the next four weeks
- Prophylaxis is recommended for women at high risk of having a thromboembolic event, such as those with any type of thrombophilia.

Immunization

- **Routine**
  - Indications and procedures for vaccination of postpartum women are similar to those described for the general population.
  - Both inactivated and live vaccines may be administered to nursing mothers.
  - Postpartum women should receive all recommended vaccines that could not be or were not administered during pregnancy (eg, measles/mumps/rubella [MMR]; varicella, Tetanus toxoids diphtheria acellular pertussis vaccine [Tdap]).
- Other household members in the newborn's home should also have up to date immunizations to create a protective 'cocoon' around the infant and thus minimize newborn exposure to infection.
- **Anti-D immune globulin**
  - Rh(D)-negative mothers of Rh(D)-positive infants should be given anti-D immune globulin.

ELECTIVE PROCEDURES

- **Tubal ligation**
  - Sterilization can be performed postpartum or as an interval procedure.
- **IUCD:**
  - Placement of intrauterine contraception within 10 minutes of placental delivery is an effective, long-term, but reversible alternative to sterilization.
- **Circumcision of male infants**

MATERNAL ISSUES (EARLY)

Pain

- **Afterpains**
  - Pain and fatigue are the two most common complaints after vaginal or cesarean delivery
  - Afterpains may occur after uncomplicated vaginal delivery due to hypertonic uterine contractions.
  - More problematic in multiparous women
  - Commonly occurs during nursing
  - Short acting nonsteroidal antiinflammatory drugs (NSAIDs) (eg, ibuprofen 600 mg orally every six hours as needed) are as or more effective than opioids for relief of pain due to uterine involution
  - The pain usually spontaneously resolves by the end of the first postpartum week.
- **Perineal pain**
  - Oral nonnarcotic analgesics (NSAIDs or acetaminophen /paracetamol 500 to 1000 mg, not to exceed 4000 mg/day) are effective for treatment of perineal pain.
  - Local cooling treatments are commonly used, but there is limited evidence to support efficacy.
- **Cesarean delivery**
  - Cesarean delivery results in more acute and chronic postpartum pain than vaginal delivery
  - Unrelieved pain causes maternal suffering and prevents optimal interaction with the newborn.
  - The pathophysiological consequences of unrelieved pain may result in medical complications,
  - psychological sequelae may also occur, three-fold increased likelihood of developing postpartum depression
- Options for postoperative analgesia include:
  - Parenteral opioids
  - Neuraxial opioids
  - Patient controlled epidural analgesia
  - Oral analgesics

Breast engorgement

- Swelling of the breast
- Occur early or late in the postpartum period.
- The breast becomes firm, enlarged, tender, and may be warm to the touch.
- Early engorgement
  - 24 and 72 hours postpartum
  - Secondary to edema, tissue swelling, and accumulated milk,
  - One to seven days
- Late engorgement is due solely to accumulated milk.

- **Lactation suppression**.
  - Drug therapy is not recommended for suppression of lactation because the risks associated with all of the currently available drugs outweigh any benefit.
  - E.g. bromocriptine , has been associated with various complications such as stroke, myocardial infarction, seizures and psychiatric problems.
  - The use of a tight brassiere and avoidance of stimulation suppresses lactation in 60 to 70 percent of women and is the recommended treatment;
  - Cool compresses or ice packs and mild analgesics, may provide effective pain management.

Voiding difficulty and urinary retention

- Postpartum urinary retention is a relatively common complication in the early puerperium.
- Absence of spontaneous micturition within six hours of vaginal delivery or within six hours of removal of an indwelling catheter after cesarean delivery
- Prevalence 4%
- Due to injury to the pudendal nerve during the birth process.
- Prolonged pudendal nerve terminal motor latency has been demonstrated after delivery and can last for two to three months postpartum
- Some women may have long-term dysfunction.
- Factors associated with an increased risk of overt postpartum urinary retention:
  - Epidural anesthesia,
  - Primiparity,
  - Instrument assisted delivery,
  - Episiotomy.
- The initial treatment of urinary retention can be noninvasive,
  - Oral rather than parenteral analgesics,
  - Use of bathroom instead of using a bedpan,
  - Providing privacy,
  - Taking a warm bath,
  - Immersion of the woman's hands in cold running water
- Pharmacological therapies are not effective for postpartum urinary retention;
- Catheterization
- Urinary retention is a self-limited disorder that can be expected to resolve within one week in most patients.
- Long-term sequelae have not been described.

Hemorrhoids

- 7.8 % of women have thrombosed external hemorrhoids during late pregnancy.
- 35 % experienced anal lesions in the postpartum period,
  - 20 percent having thrombosed external hemorrhoids
  - 15 percent having anal fissures.
  - 91 percent were noted on the first day after delivery.
- Risk factors
  - Large infants
  - Traumatic delivery.

POSTPARTUM COMPLICATIONS

- Severe obstetric morbidity rates per 1000 deliveries:
  - Blood transfusion (4.58)
  - Ventilation (0.57),
  - Adult respiratory distress syndrome (0.45),
  - Renal failure (0.28),
  - Shock (0.19),
  - Pulmonary embolism (0.18),
  - Complications of anesthesia (0.11).

Excessive or prolonged postpartum bleeding

- Excessive postpartum bleeding usually occurs in the first 24 hours after delivery, but may occur later in the postpartum period (from 24 hours to 12 weeks after the delivery).
- Vaginal bleeding that persists for more than eight weeks after delivery is unusual and may be due to
  - Infection,
  - Retained products of conception,
  - Bleeding diathesis,
  - Choriocarcinoma
  - Uterine vascular anomaly,
- A temporary increase in bleeding at this time may represent menses; in such cases, bleeding should stop within a few days.
- New bleeding several weeks after delivery could also be related to a new pregnancy.

- **Uterine inversion**
  - Uterine inversion is a rare complication of the involuting uterus, and an obstetrical emergency.
  - If not promptly recognized and treated, uterine inversion can lead to severe hemorrhage and shock.
- **Postpartum preeclampsia/eclampsia**
  - Preeclampsia/eclampsia can first manifest clinically in the postpartum period.
  - Most, but not all, of these cases occur within 48 hours of the delivery
- **Postpartum fever and infection**
  - Defined as postpartum febrile morbidity as an oral temperature of 38.0 degrees Celsius or more on any two of the first 10 days postpartum, exclusive of the first 24 hours.
  - The first 24 hours are excluded because low grade fever during this period is common and often resolves spontaneously, especially after vaginal birth.
- If fever is present, a physical examination should be performed to identify the source of infection and direct optimal therapy.
- Surgical site infections may occur at sites of
  - Episiotomy,
  - Lacerations,
  - Cesarean delivery.
- Differential diagnosis of postpartum fever:
  - Urinary tract infection
  - Wound infection (episiotomy or other surgical site infection)
  - Mastitis or breast abscess
  - Endometritis or deep surgical infection
  - Septic pelvic thrombophlebitis
  - Drug reaction
  - Clostridium difficile-associated diarrhea
  - Complications related to anesthesia

- **Episiotomy breakdown**
  - Episiotomy infections are usually localized to the skin and subcutaneous tissue.
  - On examination, the area appears swollen and erythematous with a purulent exudate.
  - Treatment consists of opening the wound, drainage, irrigation, and debridement of foreign material and necrotic tissue.
  - Antibiotics are not necessary unless there is accompanying cellulitis.
  - The area will heal by granulation, but large defects may be resutured when the wound surface is free from exudate and covered by pink granulation tissue.
  - Breakdown of perineal laceration repair has been associated with
    - Longer second stage of labor,
    - Operative vaginal delivery,
    - Mediolateral episiotomy,
    - Third and fourth degree lacerations
    - The presence of meconium stained amniotic fluid.