Project: Ghana Emergency Medicine Collaborative

Document Title: Postpartum Emergencies

Author(s): Joseph Hartmann, D.O., F.A.E.C.P.

Attribution Key

for more information see: http://open.umich.edu/wiki/AttributionPolicy

Use + Share + Adapt

{ Content the copyright holder, author, or law permits you to use, share and adapt. }

Public Domain – Government: Works that are produced by the U.S. Government. (17 USC § 105)

Public Domain – Expired: Works that are no longer protected due to an expired copyright term.

Public Domain – Self Dedicated: Works that a copyright holder has dedicated to the public domain.

Creative Commons – Zero Waiver

Creative Commons – Attribution License

Creative Commons – Attribution Share Alike License

Creative Commons – Attribution Noncommercial License

Creative Commons – Attribution Noncommercial Share Alike License

GNU – Free Documentation License

Make Your Own Assessment

{ Content Open.Michigan believes can be used, shared, and adapted because it is ineligible for copyright. }

Public Domain – Ineligible: Works that are ineligible for copyright protection in the U.S. (17 USC § 102(b)) *laws in your jurisdiction may differ

{ Content Open.Michigan has used under a Fair Use determination. }

Fair Use: Use of works that is determined to be Fair consistent with the U.S. Copyright Act. (17 USC § 107) *laws in your jurisdiction may differ

Our determination **DOES NOT** mean that all uses of this 3rd-party content are Fair Uses and we **DO NOT** guarantee that your use of the content is Fair.

To use this content you should **do your own independent analysis** to determine whether or not your use will be Fair.

Postpartum Emergencies

Joseph H. Hartmann, D.O., FACEP
Department of Emergency Medicine
University of Michigan Health System

Introduction

- Why this topic? Relevance?
  - Dependent on communities serviced
    - Urban / suburban / rural
    - Availability of obstetrical / midwifery care
    - Prevalence of clinic or ED uterine evacuation procedures
      - Elective abortion
      - Nonviable intrauterine pregnancy
- ? Prior exposure
  - Training
  - Clinical practice

Introduction

- Johann Wolfgang von Goethe (1749 – 1832)
- “Was man nicht versteht, besitzt man nicht.”
- What one does not understand, one does not possess.
- We see, what we know.

PD-EXP G. Meiners, Wikimedia Commons

Definitions

- Postpartum – period of time following parturition (childbirth) = 2 – 4 weeks
- Termination of pregnancy
  - Spontaneous abortion (miscarriage)
  - Incomplete abortion
  - Elective abortion
- Dilation & curettage (D&C)
- Vacuum aspiration

Epidemiology

- Uncommon but not rare
- Generally increasingly less likely as time passes from point of parturition or loss of pregnancy
- Difficult to provide frequency of occurrence
  - Vaginal vrs. cesarean delivery
  - Hospital vrs. home delivery
  - Spontaneous vrs. elective abortion
  - Vacuum aspiration vrs. D&C

Case Presentation

A 32 y/o mother has been home for 4 days after a 2 day hospital stay after delivering a 8lb 10 oz baby. She has been pretty active at home and has noted increasing vaginal bleeding after the first day home. This has persistently worsened the past 3 days. When she got up in the middle of the night to tend to the baby her husband heard a crash, found his wife had fainted, called 911.

Pale, 86/50, 135, 24, 99% cool, clammy, mentating normally

Hemorrhage
Introduction

- Major cause of morbidity / mortality
- Excessive bleeding
  - Lightheadedness, dizziness, syncope (fainting)
  - Hypotension, tachycardia
- Sequelae
  - shock, renal failure, acute respiratory distress syndrome (ARDS), coagulopathy (DIC), Sheehan's syndrome (pituitary infarction)

Hemorrhage
Epidemiology

- Uterine, cervical or vaginal laceration
  - 1 in 8 deliveries
- Uterine atony – 1 in 20 deliveries
- Retained “products of conception” / placenta
- Dehiscence of uterine incision site
- Coagulopathy (clotting disorders)
  - Abruptio placentae
  - Sepsis
  - Amniotic fluid embolism

Hemorrhage
Pathophysiology

- Injury to uterus / birth canal
  - Naturally occurring
  - Iatrogenic –episiotomy, operative, instrumentation
- Uterine enlargement
  - Birth weight > 4000 grams / 8 ½ lbs
  - Multiple gestation
  - Multiparity
- Labor process

Hemorrhage
Pathophysiology

- Labor process
  - Prolonged labor
    - Particularly 3rd stage – “arrest of descent”
  - Rapid labor
    - Lack of accommodation of birth canal
  - Induced labor

Hemorrhage
Clinical Presentation

Blood loss % (ml)	Blood pressure mm Hg	signs / symptoms
10-15 (500-1000) tachycardia	normal	palpitations, dizziness,
15-25 (1000-15000	slightly low	weakness, sweating, tachycardia
25-35 (1500-2000)	70 – 80	restlessness, pallor, oliguria
35-45 (2000-3000)	50 – 70	collapse, air hunger, anuria

Adapted from Bonnar, J. Baillieres Best Pract Res Clin Obstetric Gynaecol 2000; 14:1.

Hemorrhage
Clinical Presentation

- Vaginal bleeding – most common
- Occult bleeding – needs to be considered

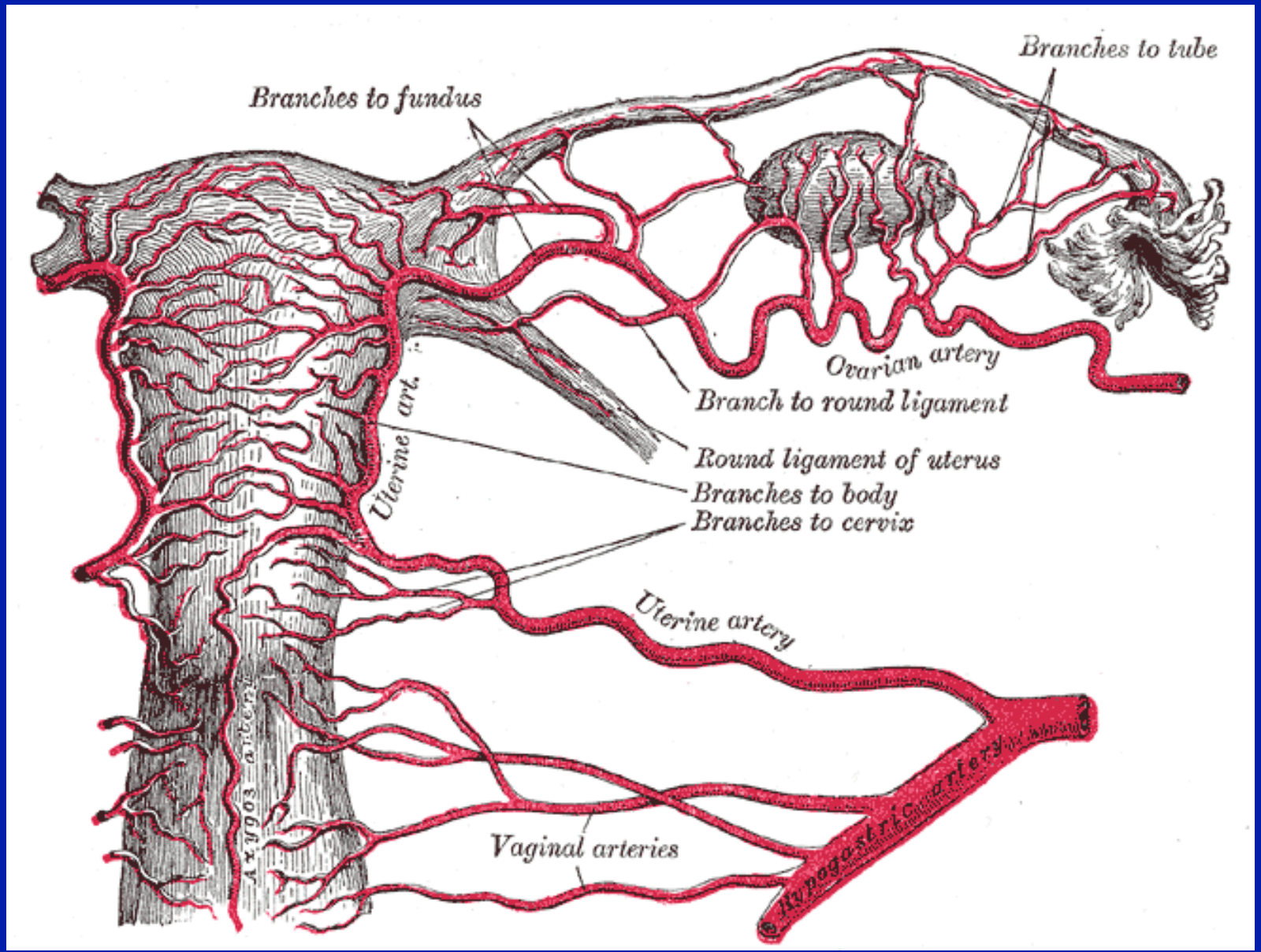
- Excessive hemorrhage eventually causes a dilutional coagulopathy leading to shock with systemic ramifications
  - Renal, pulmonary, endocrine
  - May result in emergent hysterectomy

Hemorrhage
Management

- In the field
  - Fundal massage
  - IV access – 2 large bore (16 g) venous catheters
  - Lactated Ringers or Normal Saline
    - Don't over infuse
      - Dilutional cagulopathy
      - ARDS (shock lung)

Hemorrhage
Management

- In the hospital setting
  - Uterotonics – Rx to contract the uterus
  - Transfusion of blood products
    - Packed RBC, fresh frozen plasma, platelets
  - Inspect / repair cervical / vaginal lacerations
  - Arterial embolization
  - Laparotomy
    - Uterine artery ligation
  - Hysterectomy



Gray's Anatomy, Wikimedia Commons

Hemorrhage
Final thoughts

- Most common cause of maternal complications and death after delivery.
- 10% recurrence rate with subsequent pregnancies

Case Presentation

A 24 y/o mother had a noncomplicated C-section and on the 3rd day after hospital discharge has noted increasingly worsening lower abdominal pain with 102.6 fever. When asked she has had increasingly malodorous / bloody vaginal discharge. C-section incision site appears to be healing well.

Flushed, 110/72, 144, 26, 100%, warm, moist

Endometritis
Introduction

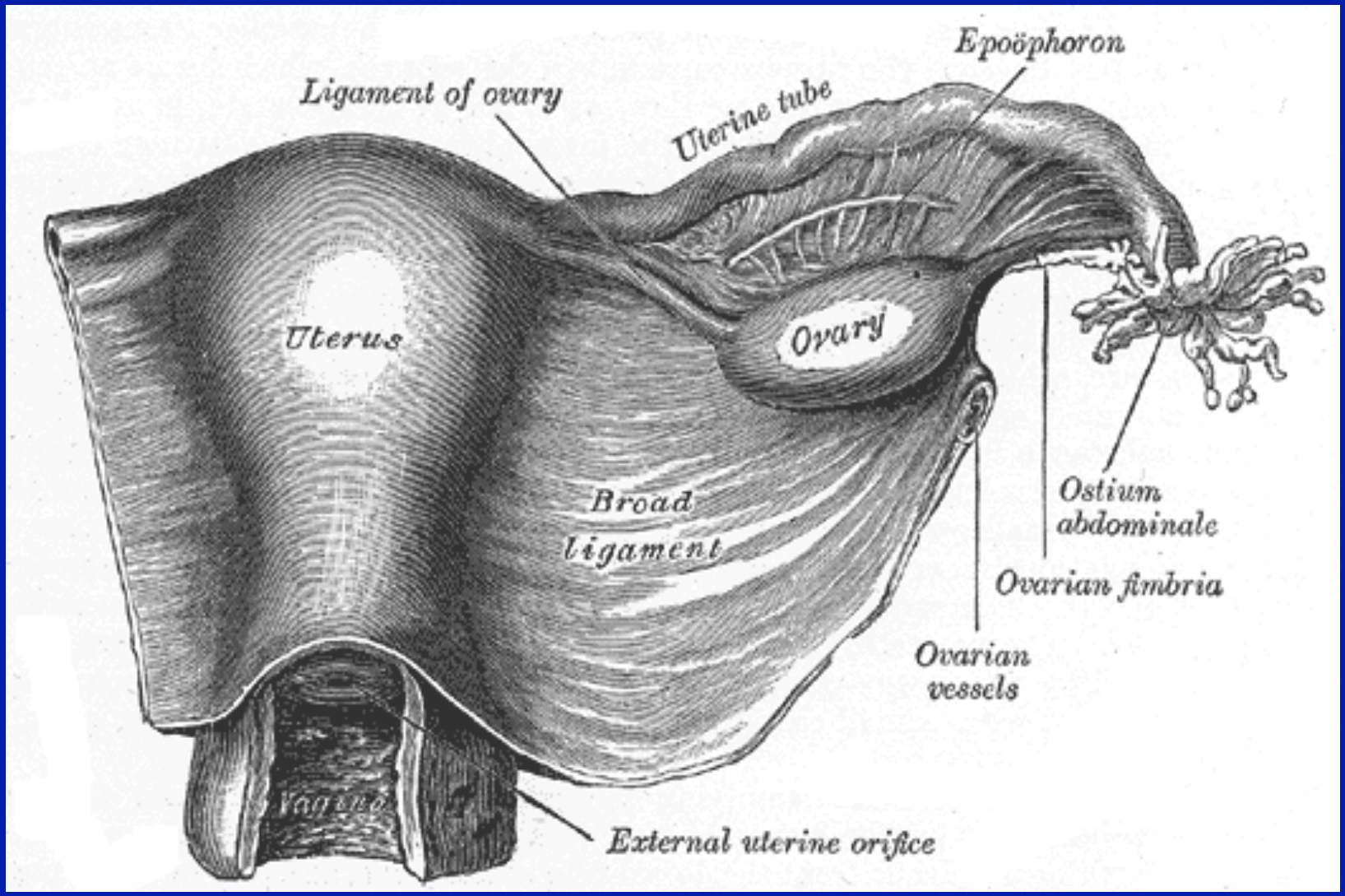
- Inflammation of the endometrium – inner lining of uterus
- Postpartum population
  - Prolonged labor
  - Prolonged rupture of membranes
    (multiple vaginal examinations)
  - Cesarean delivery after labor
  - Retained product of conception
    - Post delivery or post uterine evacuation procedures

Endometritis
Epidemiology

- Single most important risk factor is route of delivery
  - Vaginal delivery < 3%
  - Cesarean delivery 15 -30%
    - Contamination from cervical manipulation
    - Prolonged rupture of membranes
    - Presence of suture material
    - Tissue necrosis at the suture line
    - Hematoma / seroma formation

Endometritis
Pathophysiology

- Ascending infectious process from birth canal
- Vaginal colonization of particular bacterial strain
  - Group B streptococcus
  - 80% likelihood



Gray's Anatomy, Wikimedia Commons

Endometritis
Clinical Presentation

- Fever
- Lower abdominal pain / tenderness over the uterus
- Increased vaginal bleeding with malodor several days after delivery or procedure
- May lead to sepsis / septicemia

Endometritis
Clinical Presentation

- Sepsis / septicemia
  - Profoundly ill-appearing patient (early shock)
  - Tachycardia
  - Hypotensive
  - Poor urine output
  - Mental status changes (drowsy, confused, disoriented)
- Pelvic abcess
- Septic pelvic thrombophlebitis

Endometritis
Management

- In the field
  - Supportive
    - It's not "the flu".
    - IV fluid resuscitation (prefer large bore catheter)
- In the hospital setting
  - IV antibiotic therapy
  - ? curettage

Endometritis
Final Thoughts

- Antibiotic prophylaxis for high risk women undergoing cesarean delivery
- Retained products of conception after
  - Spontaneous abortion
  - Elective abortion
  - Vaginal delivery
  - D&C

  can promote a chronic endometritis with a less acute presentation

Case Presentation

You are called to a home of a 30 y/o mother with chest pain. She delivered a healthy baby one week ago. She notes pain with deep inspiration, feels short of breath, and also complains of left leg swelling and pain.

Moderate distress, 136/82, 136, 30, 84%

Thromboembolism / Pulmonary Embolism
Introduction

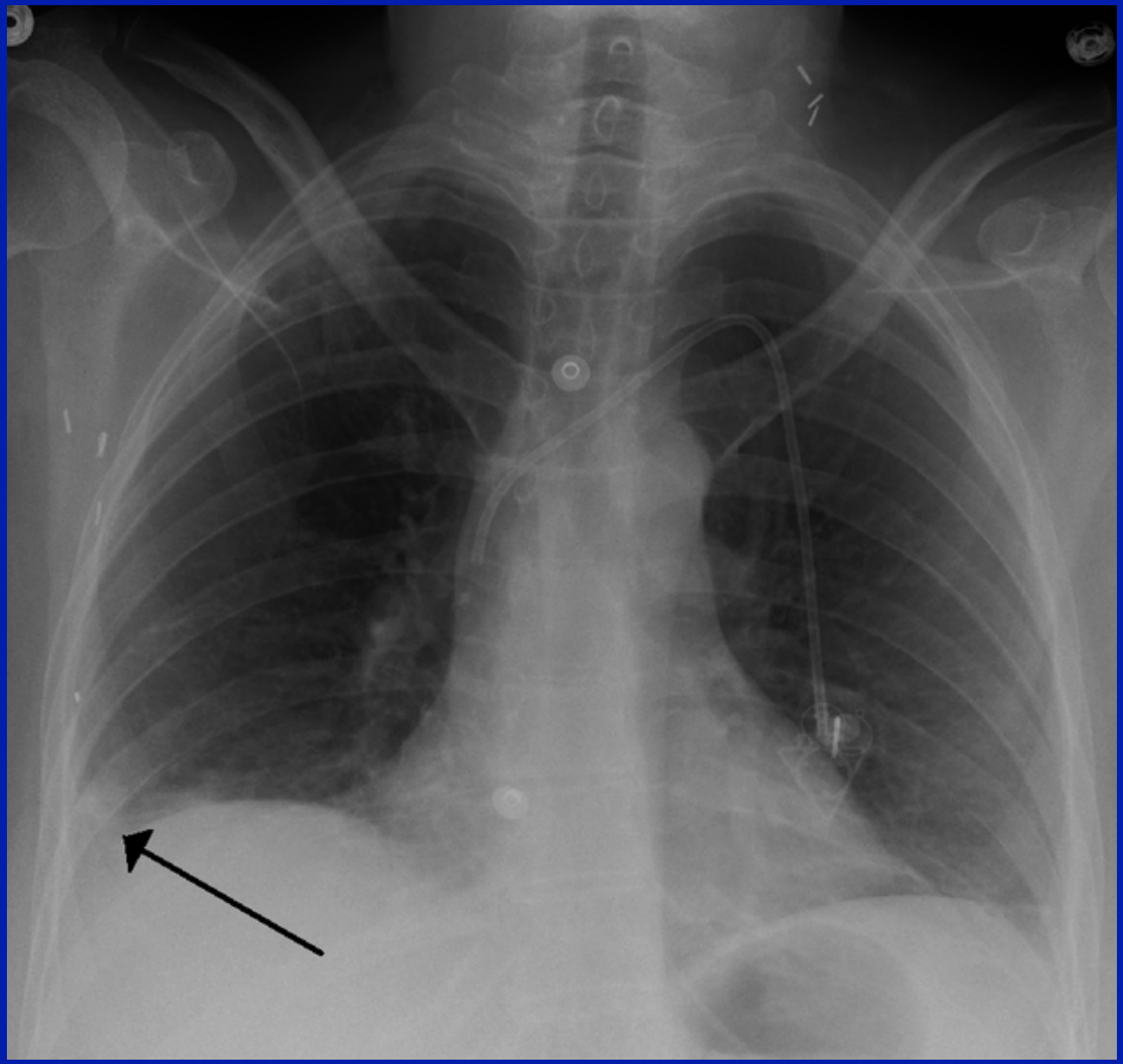
- Thromboembolism – blood clot in vein(s)
- Pulmonary embolism – blood clot in “veins” in lung(s)
- Second most common cause of death in pregnant women in U.S.

Thromboembolism / Pulmonary Embolism
Epidemiology

- Pregnancy is an independent risk factor for thromboembolism – 5 x greater risk
- Thromboembolism is 5 x higher in post-partum period than during pregnancy.
- Pulmonary embolism is 15 x higher during postpartum period

Thromboembolism / Pulmonary Embolism
Pathophysiology

- Pregnant state induces a state of natural hypercoagulability
  - Biochemical
    - Increased clotting factors
    - Decreased protein components
  - Physiologic
    - Venous stasis (sluggish blood flow) – (< 1/3 of usual blood flow)
    - Pregnant uterus compresses blood returning from lower extremeties (veins)



James Heilman, MD Wikimedia Commons

Hampton lump in a person with a right pulmonary lobe embolism

Thromboembolism / Pulmonary Embolism
Clinical Presentation

- Thromboembolism
  - Worsening lower extremity swelling, commonly calf
  - Fairly localized pain
  - Pain with ambulation
  - Calf pain with palpation
  - Palpable venous cord
  - Pain with flexing foot upward (Homan's sign)

Thromboembolism / Pulmonary Embolism
Clinical Presentation

- Pulmonary embolism
  - Dyspnea
  - Chest / back pain – PLEURITIC
  - Tachycardia
  - Tachypnea
  - Hypoxemia
  - Lung sounds – clear
  - Heart sounds – fast but normal
  - Extremeties - ? evidence of thromboembolism

Thromboembolism / Pulmonary Embolism
Management

- In the field
  - Oxygen administration
  - Monitor pulse oximetry
  - NC / mask / assisted ventilation
  - IV access if possible
- In the hospital
  - Anticoagulation therapy
  - Monitor for cardiopulmonary compromise

Thromboembolism / Pulmonary Embolism
Final Thoughts

- Maintain a high index of suspicion
  (second most common cause of death
  in pregnancy)

Case Presentation

Called to an apartment complex for c/o 18 y/o female in respiratory distress. On arrival you find a patient who appears shocky and a very nervous boyfriend. Patient is groggy but oriented and appears pale and dusky.

76/50, 176, 36, mid 70's% (difficult to detect)

While quickly preparing her for transport with an initial negative history the boyfriend finally offers that she had an abortion earlier that day.

Amniotic Fluid Embolism
Introduction

- Anaphylactoid syndrome of pregnancy
- Catastrophic condition
- High mortality rate
  - cardiopulmonary collapse
- High morbidity rate
  - Neurologic (cerebral hypoxia)

Amniotic Fluid Embolism
Epidemiology

- Rare
- Most commonly occurs during
  - Labor and delivery (precipitous)
  - Immediate postpartum period
  - Can occur up to 48 hrs postpartum
- Can follow
  - Vaginal delivery or cesarean delivery
  - Elective terminations (abortions)
  - Amniocentesis

Amniotic Fluid Embolism
Pathophysiology

- Amniotic fluid enters maternal circulation through
  - Veins draining the uterus
  - Site of placental insertion
  - Site of uterine trauma
- Abnormal amniotic fluid may be required to produce the syndrome
- Abnormal immune response by the mother to fetal-associated substances

Amniotic Fluid Embolism
Clinical Presentation

- Hypoxia and respiratory failure
- Cardiogenic shock
  - "pump failure"
- Disseminated intravascular coagulation (DIC)
  - Massive internal / external bleeding

Amniotic Fluid Embolism
Management

- Unpredictable
- Unpreventable
- Without specific treatment

- In the field
  - Supportive - BLS / ACLS
- In the hospital setting
  - High tech supportive measures

Amniotic Fluid Embolism
Final Thoughts

- Maternal mortality 60 - 90 %
- Neurologically intact survival 15 %

- Nonspecific symptoms may precede onset of hypoxemia and shock
  - Chills
  - Nausea / vomiting
  - Agitation

Case Presentation

A 22 y/o mother delivered her first baby and has been home for 2 days (4th day after delivery). She complains of a bad "stomach flu". She is a single mother and currently can't take care of herself let alone her baby and requests transport. Specifically, she complains of upper abdominal pain, nausea / vomiting, headache but no fever.

Appears ill but not toxic, 145/92, 110, 18, 98%

HELLP Syndrome
Introduction

- **H** emolysis (breakdown of RBCs)
- **E** levated **L** iver enzymes (liver blood tests)
- **L** ow **P** latelet count (blood clotting agent)

HELLP Syndrome
Epidemiology

- 10 – 20% of women with severe pre-eclampsia / eclampsia
- Majority of presentations occur during pregnancy – 5th through 8th month
- 30% occurrence rate in postpartum period
  - Usually in first few days but can occur one week later

HELLP Syndrome
Pathophysiology

- Severe form of preeclampsia
  vrs. separate disorder

HELLP Syndrome
Clinical Presentation

- Hypertension > or = 140 / 90 (85%)
- Excessive protein in urine
- Abdominal pain
  - Right upper quadrant / epigastric
- Nausea / vomiting
- Headache
- Visual changes (+/-)

HELLP Syndrome
Management

- In the field
  - Supplemental oxygen
  - IV access
  - Recognize significance of “flu” with modestly elevated blood pressure
- In the hospital setting
  - Hypertensive emergency
  - Diagnostic evaluation

HELLP Syndrome
Final Thoughts

- Prognosis is generally good
  - Mortality is low at 1 %
  - Complications are variable
    - Blood and / or platelet transfusions aren't uncommon
    - Major intra-abdominal bleeding is uncommon
    - Liver hemorrhage to the point of rupture can occur
- Sense of urgency is greater prior to delivery

Case Presentation

Your patient is a 38 y/o mother who recently delivered her first baby. She complains of a "severe migraine". She has no prior history of migraines and states she has a bad headache with blurring of her vision and sensitivity to light. She says her headache is making her stomach hurt – pointing to the upper abdomen.

Uncomfortable appearing,136/90, 110, 14, 100%

You package the patient, are enroute when she begins to have a tonic-clonic (grand mal) seizure.

Preeclampsia / eclampsia
Introduction

- Eclampsia – 1 or more generalized seizure(s) and / or coma in the setting of pre-ecalmpsia
- Preeclampsia
  - Weight gain
  - Increased protein in urine
  - Hypertension

Preeclampsia / Eclampsia
Epidemiology

- Common cause of maternal death in U.S.
- 25 – 30 % occur after delivery of infant
- Peak incidence
  - Teen years
  - Young twenties
  - > 35 yrs of age
- Nulliparous (1st pregnancies)
- Lower socioeconomic background

Preeclampsia / Eclampsia
Pathophysiology

- ??? Seizure = CNS disorder
- Cerebral over-regulation of high BP resulting in under-perfusion (decreased circulation to brain cells)
- Cerebral under-regulation of high BP resulting in over-perfusion (damages blood vessels resulting in leakage of fluid in brain – hypertensive encephalopathy)

James Heilman, MD, Wikimedia Commons

Preeclampsia / Eclampsia
Clinical Presentation

- Preeclampsia
  - Weight gain
  - Increased protein in urine
  - Relative hypertension - 140 / 90
- Severe preeclampsia
  - Frontal or occipital headache
  - Blurred vision
  - Photophobia – marked sensitivity to light
  - Upper abdominal pain – RUQ / epigastric
  - Altered mental status

Preeclampsia / Eclampsia
Clinical Presentation

- Eclampsia
  - 1 or more generalized seizure or coma
  - Seizure lasts 60 – 75 sec
    (rarely lasts longer than 3 – 4 min)

Preeclampsia / Eclampsia
Management

- In the field
  - Seizure precautions
  - Maintain airway patency
  - Position to prevent aspiration
  - Supplemental oxygen
  - IV access if possible

Preeclampsia / Eclampsia
Management

- In the hospital setting
  - Seizure treatment
    - Benzodiazepams (Valium, Ativan)
    - Magnesium sulfate IM in buttocks or IV
  - Hypertension treatment
    - Labetolol (Trandate, Normodyne)
    - Hydralazine (Apresoline)

Preeclampsia / Eclampsia
Final Thoughts

- As seen with HELLP syndrome symptoms can seem nonspecific and similar to “flu”. The modest elevation of BP in the pregnant and postpartum patient is the key finding.

Case presentation

A 34 y/o mother of 3 recently delivered 10 days before now complains of increasing shortness of breath over the past week. She first thought it was a “cold” but now is worried she might have pneumonia. She has had no fever but her dyspnea has progressively worsened and when she coughs she is noting frothy sputum. The last two nights she has slept (poorly) using a recliner. She has no leg swelling and notes she was previously healthy.

126/78, 118, 28, 91%

Peripartum Cardiomyopathy
Introduction

- Pregnancy-Associated Cardiomyopathy
- Abnormality of heart muscle in which it is weakened resulting in heart failure.
- Four criteria
  - Development in last month of pregnancy or within 5 months of delivery
  - No other causes of heart failure
  - No prior heart disease earlier in pregnancy
  - Echocardiographic evidence of dysfunction

Peripartum Cardiomyopathy
Epidemiology

- Incidence – quite variable, in US it is infrequent but not rare
- Risk factors
  - Age greater than 30 yrs
  - Multiparity
  - Multiple gestation
  - Women of African descent
  - Hx of preeclampsia, eclampsia, postpartum hypertension
  - Maternal cocaine abuse

Peripartum Cardiomyopathy
Pathophysiology

- ???
- In pregnancy
  - Significant increase in blood volume
  - Significant increase in cardiac output
  - Results in remodeling of left ventricle with transient enlargement of the cardiac muscle
- In postpartum
  - Reversal of above changes after delivery
  - Exaggerated decrease in function of left ventricle (overcompensation occurs)

Peripartum Cardiomyopathy
Pathophysiology

- Presence of hypertension during pregnancy may be provocative of PPCM
- Underlying cardiac disease (valves, muscle, or vascular dysfunction) develop symptoms during second trimester (hemodynamic burden)

Peripartum Cardiomyopathy
Clinical Presentation

- Previously “healthy” mothers (no heart dz)
  - Shortness of breath
  - Cough (frothy sputum)
  - Shortness of breath when lying flat (orthopnea)
  - Shortness of breath that awakens one from a sound sleep (paroxysmal nocturnal dyspnea)
  - Coughing blood (hemoptysis)
- ECG – sinus tachycardia / nonspecific ST and T wave changes

Peripartum Cardiomyopathy
Management

- In the field
  - Oxygen
  - Assisted ventilation if necessary
    - Bag valve mask / intubation
  - Transport Fowler position
  - Cardiac monitoring

Peripartum Cardiomyopathy
Management

- In the hospital setting
  - CHF treatment
    - Diuretics
    - Hypertension control
    - Vasodilator therapy
- Ventricular dysrhythmias
- Anticoagulation - high risk of P.E.
    - Hypercoagulable state of pregnancy
    - Stasis of blood flow in left ventricle
- Heart transplantation - was 30%, now 5%

Peripartum Cardiomyopathy
Final Thoughts

- 10% mortality rate
  - Progressive “pump” failure
  - Sudden cardiac death
  - Thromboembolic events
    - Pulmonary embolism
    - Stroke
- Roughly 50% improve to near normal cardiac capacity
- Subsequent pregnancies place recovered patient at risk

Case Presentation

You arrive at a home scene call – police are present. A woman is locked in her bedroom with her newborn baby (2 wks old). Her husband is frantic stating that his wife has been depressed since coming home from the hospital and it is getting worse. She spends nearly her entire day / night in the darkened bedroom. He fears that she might harm herself and / or the baby.

Postpartum Depression
Introduction

- Postpartum Blues
  - Transient
  - Mild
  - Rapid mood swings
    - Joy / sadness / irritability / anxiety / insomnia / crying spells
  - 40 – 80% occurrence
  - Develops 2 – 3 days after delivery
  - Resolves within 2 weeks
  - Treatment is supportive (3 R's)
    - Reassurance, rest, Rx

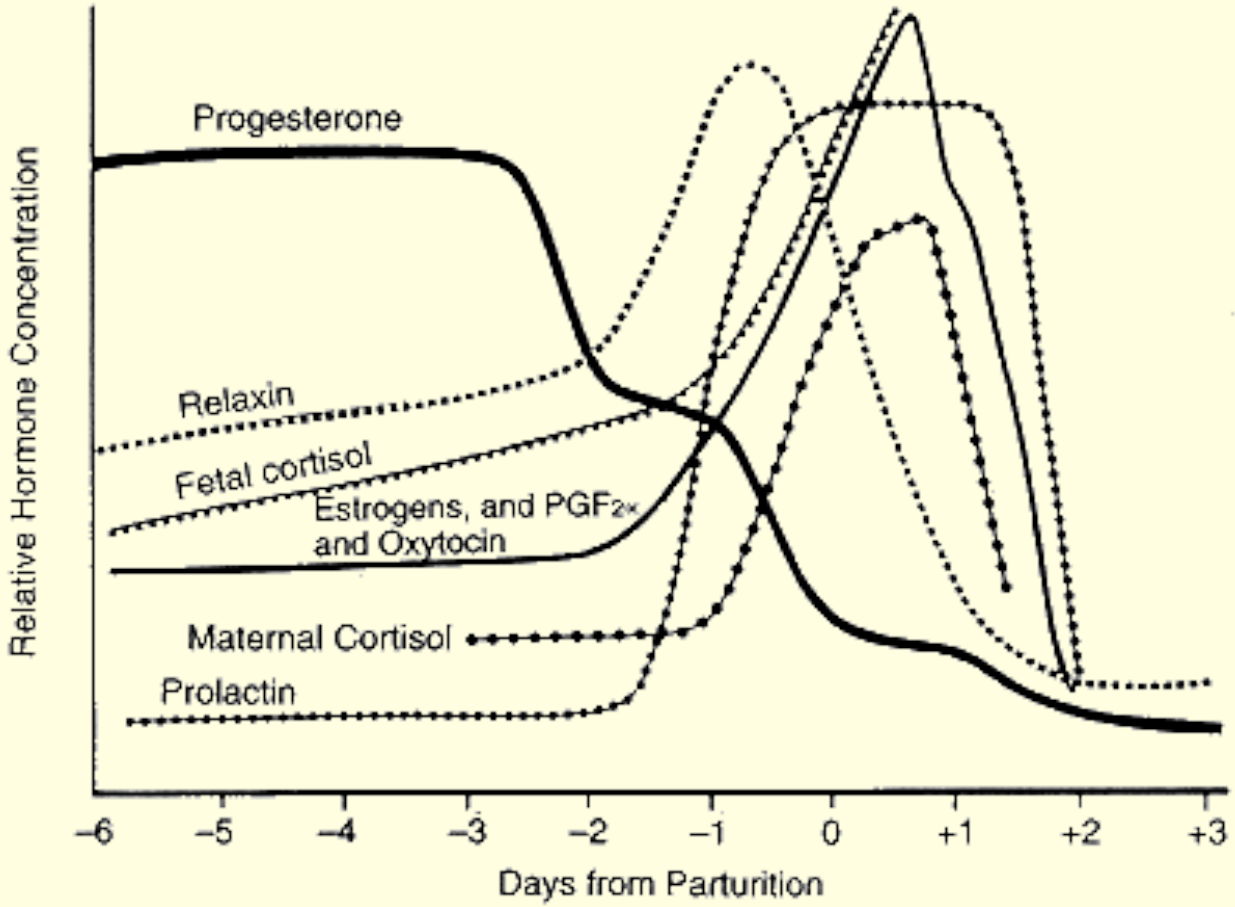
Luis Sarabia, Flickr

Postpartum Depression
Epidemiology

- Major depression – 10% occurrence
- Risk factors
  - Personal history of depression
  - Family history of depression
  - External stressors
    - Marital / financial / lack of social support / child care
- Pregnancy loss
  - Miscarriage / stillbirth / elective abortion

Postpartum Depression
Pathophysiology

- Sensitivity to abrupt hormonal changes
  - Decrease in gonadal steroids



 Source Undetermined

Postpartum Depression
Clinical Presentation

- Somatic functional changes
  - Sleep / energy level / loss of appetite / weight loss / libido
- Anxiety / Panic attacks
- Intense irritability / anger
- Feelings of overwhelm / inadequacy
- “scary thoughts” – random obsessional thoughts of suicide or infanticide

Postpartum Depression
Management

- In the field
  - Recognition
  - Supportive (emotional)
  - Transport
- In the hospital setting
  - Biological factors – Rx, light Tx, ECT
  - Psychological factors – psychotherapy
  - Social factors – social service interventions

Postpartum Depression
Final Thoughts

- Postpartum psychosis
  - Loss of contact with reality
  - Hallucinations
  - Suicide / infanticide become real threats

Conclusion

- Serves us well to have a heightened awareness of postpartum difficulties that can not uncommonly be subtle in their presenting symptoms yet portend medical conditions of a truly emergent nature.
- For many of those conditions presented the primary treatment *in the field* is the recognition of possible maternal morbidity / mortality and the need for transport.