

Cardiovascular Emergencies related to Pregnancy



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Focus: 3rd trimester & post partum



- Very special population:
 - Mom plus viable fetus
 - Hemodynamic, physiologic, hormonal & connective tissue changes
 - CHANGES IN EVERY ORGAN SYSTEM !!
- Highly emotional situations for family and EMS
- Cardiovascular emergencies are rare but disastrous
- REMEMBER: Some of these diagnoses can happen weeks to months after delivery!!

Cardiopulmonary Changes

- ↑ cardiac output
- ↑ heart rate
- ↑ O₂ consumption
- ↑ vascular volume
- ↓ systemic vascular resistance
- ↓ BP
- ↑ tidal volume
- ↓ ETCO₂



- Supine hypotensive syndrome
- Major fluid shifts with contractions
- Sudden major changes at delivery

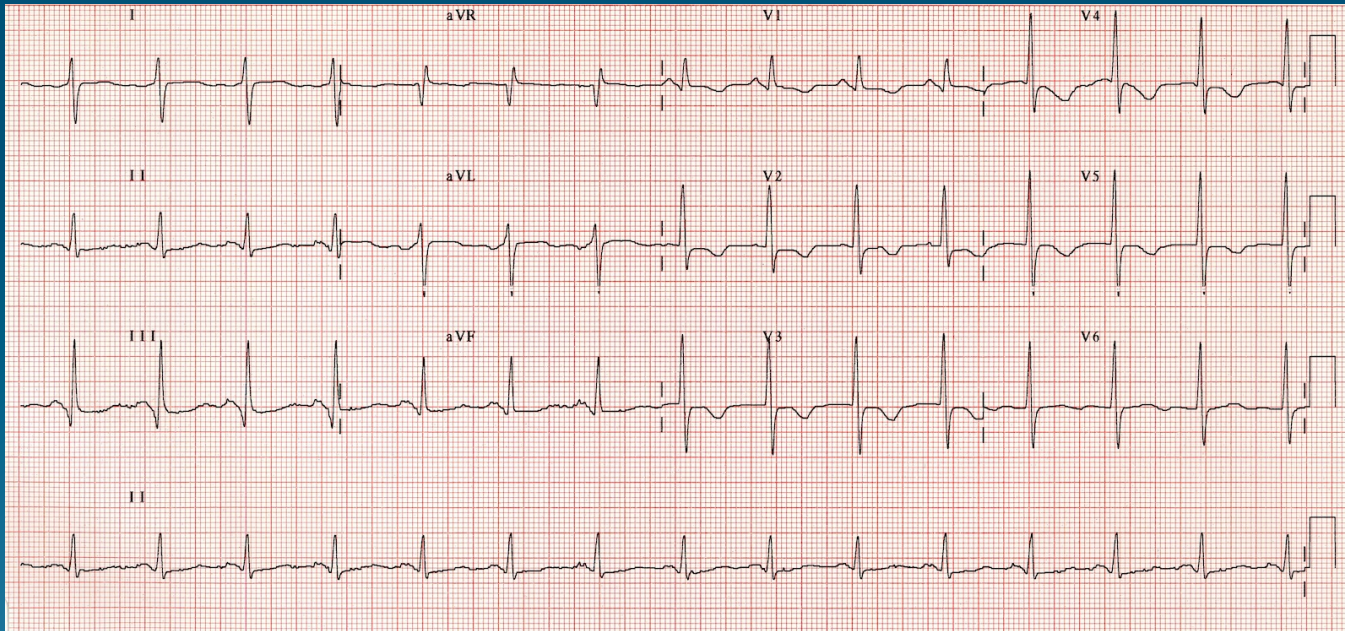
Chest pain in young women: Case 1

21 yr old woman 35 wks pregnant with chest pain

- Stuttering onset over 6 hr period
- Suddenly much worse, collapses with syncope
- BP 80/40, O₂ sat 94%, tachypneic
- Arousable, confused, large SQ scalp hematoma
- No past medical problems, uneventful pregnancy

AND THE DIAGNOSIS IS??

Case 1



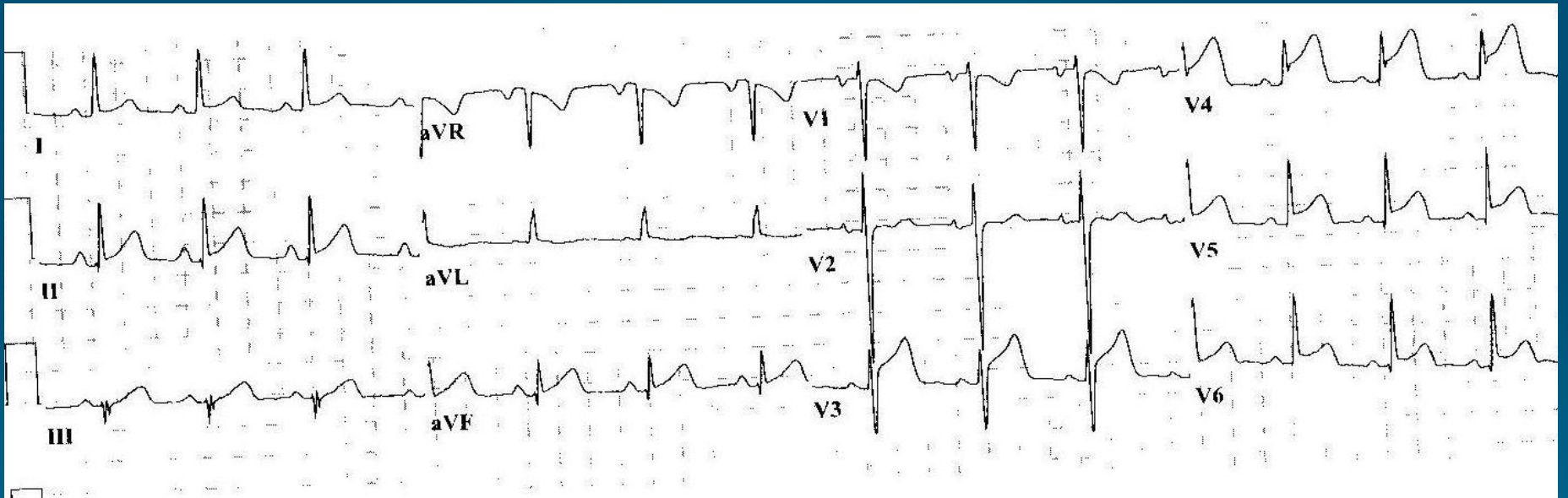
Deep S in I, Q in 3, other T wave changes

CP in young ♀: Case 2

38 yr old Haitian woman:

- 2 weeks post partum after 8th child
- Severe “pain all over,” mostly chest and epigastric
- Anxious, histrionic, language barrier
- Tachypneic, tachycardic, clear lungs

Case 2



BUT WHY??

ZERO cardiac risk factors for atherosclerosis

Coronary Artery Dissection !!



- Spontaneous CA Dissection:
 - Like the aorta, arterial wall layers can separate
 - Creates a false lumen for blood flow within wall
 - Occludes true lumen so no distal flow
 - Flow may re-enter main lumen if inner lining tears
- “Secondary” CA Dissection
 - Extension of aortic dissection
 - Complication of cardiac cath/angioplasty
 - Trauma

Spontaneous Coronary Artery Dissection

- Uncommon but well-described
- Young >> old; 3-5 women : 1 man
- Young women:
 - 1/3 occur post partum or late pregnancy
 - 78% LAD, 24% Left Main, 40% multiple arteries
 - No risk factors for atherosclerosis
 - Accounts for ~30% of MIs in pregnancy or PP
- Older men:
 - 60% RCA so better survival
- Other victims with rare diseases (e.g., Kawasaki disease) or cocaine

SCAD in pregnancy

- Pathophysiology ???
 - Hormonal changes in connective tissue
 - Hemodynamic changes
 - Hypercoagulable state
 - Eosinophilic infiltration into tissue
- **Prehospital care same as any STEMI**
- Dx in hospital (cath, esophageal US)
- Outcomes:
 - May heal spontaneously, cause MI or sudden death
 - High mortality but now down to about 30%
 - **Needs cath, angioplasty, often stents**

CP in young women: Case 3

28 yr old woman with severe CP:

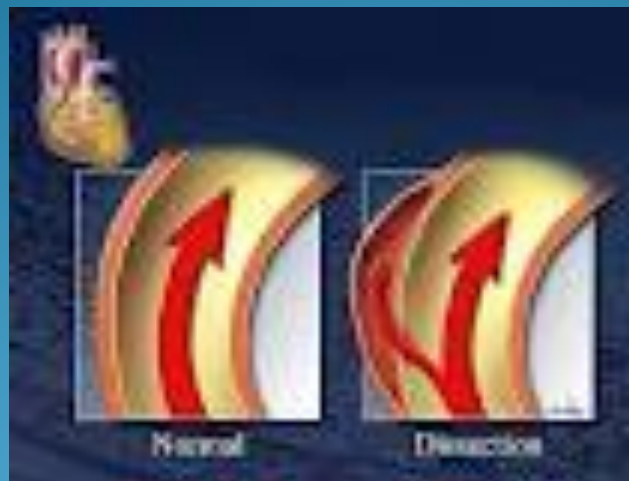
- 2 weeks post partum, no past medical hx
- Her mother called 911
- Exam, VS, O₂ sat, 12 lead EKG nl
- She adamantly refused transport to ED

EMS called back to home 1 hr later

- Patient in PEA cardiac arrest
- Could not be resuscitated

Thoracic Aortic Dissection

- Association with pregnancy well-described
- Connective tissue changes
- Of dissections in women <40, half are associated with pregnancy
- Occurs with or w/o actual aneurysm

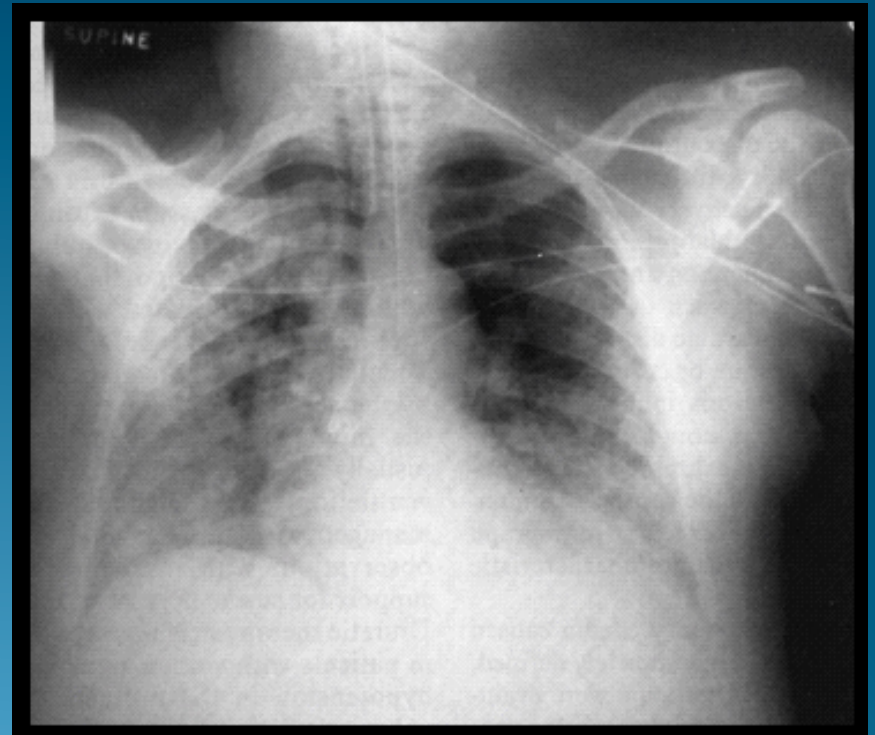


Dyspnea in Pregnant and PP Women

- Same DDx as men and non-pregnant women, but:
- Major concern re thromboembolism
 - May have entirely NORMAL exam, O₂ sat, 12 lead
 - Pregnancy, peripartum, post-partum
 - Also big concern in women on oral contraceptives
- Be VERY careful with “acute anxiety/hyperventilation syndrome” label !!

CHF in young women

- Valvular heart disease
- Anemia
- Myocarditis
- Hypertrophic CM
- Peripartum CM



Peripartum Cardiomyopathy

- >36 wk gestation to 5 mos. post partum
- Gradual onset of LV systolic dysfunction and SOB
- Typical scenario:
 - Acute pulmonary edema while in labor or early pp
 - SOB, tachypneic, respiratory distress
 - Rales may be hard to hear in 3rd trimester
- Usual EMS Rx for respiratory distress, including CPAP
- Hospital Dx via Echo
- Mortality high (10-20%) but half recover fully

Case 4 : A Near Miss (an ER miss)

27 yr old woman with first time seizure:

- Severe headache with blurry vision for 1 day
- Was seen at ED earlier for h/a, treated and sent home feeling better, but h/a came back
- 8 days s/p C-section at full term
- EMS finds BP 160/96, nl FSG and O₂ Sat, mild peripheral edema
- Then second seizure....

DRUG OF CHOICE??

Hypertensive Diseases of Pregnancy

- **Pre-eclampsia:** 5-10% of pregnancies
- **Eclampsia:** seizure
- Chronic hypertension
- HELLP syndrome
 - Hemolysis, Elevated Liver enzymes, Low Platelets
 - Hypertensive crisis, renal failure
 - RUQ pain
 - DIC and bleeding

Pre-eclampsia

- BP > 140/90, onset after 20 wks
- Proteinuria
- Maybe edema (hands, face)
- Treat severe pre-eclampsia!
 - Changes in vision
 - Headache
 - Nausea / vomiting
 - Epigastric pain
 - Edema
 - Hyperreflexia –or– Anxious, irritable, jittery



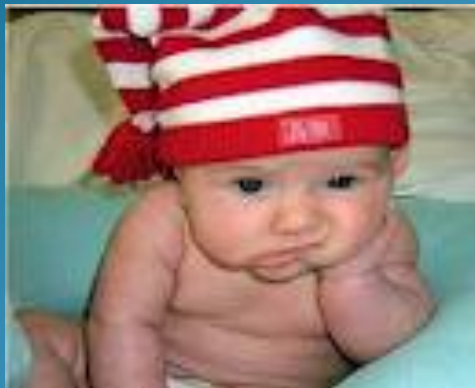
Pre-eclampsia / Eclampsia

- Mag sulfate is the drug of choice to prevent or treat seizures—much better than benzos!
- Loading dose 4 to 6 g IV slowly
- Maintenance drip at hospital
- Position patient on her left side, or manually shift the uterus to left if she is supine
- During pregnancy, the best treatment is delivery!

MAY OCCUR UP TO 4 WEEKS POST
PARTUM!!

Bottom Lines...

- The best care for the fetus is to take very good care of Mom
- Just because the baby's already born doesn't mean Mom's physiology is back to baseline
- Do a good assessment, start treatment on the usual protocols, then think a little harder
- Whenever you get too comfortable with what you think you know, along comes a patient who teaches you to stay humble



A little extra credit (wouldn't fit into 10 min time limit):

Cardiac arrest considerations in 3rd trimester

- Immediate chest compressions with minimal interruption
- Consider cricoid pressure with lower volume BVM breaths, plus early ETT as preferred airway (high risk of aspiration in these pts from uterus compressing stomach)
- Manually shift uterus toward the left during CPR or shock mgmt (increases blood return to the heart by relieving compression of vena cava)
- Follow usual protocols; DO give IVF boluses for PEA
- Consider fetal viability as above 24 wks gestation
- Optimal treatment for mom = best way to save the baby
- Rapidly start transport to an ED for possible C section during CPR (best done within 15 min but often OK to 30 min); ED may opt for open-chest cardiac compressions
- Sometimes moms get ROSC right AFTER c-section!