



TRAUMA IN PREGNANCY

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- Thank you to Northwest Texas Hospital/Texas Tech/Laura Bush Institute
- Courtney Terrell, RN
- Alana Carrasco, MD



OBJECTIVES

- ❑ How to evaluate the pregnant trauma patient
- ❑ How to treat the trauma patient
- ❑ How to assess the fetus



Trauma in Pregnancy

- ❑ ~ 8% of pregnancies (1,2)
- ❑ Trauma is one of the most common causes of death among pregnant patients (1,6)
- ❑ Management can be emotionally charged due to the pregnancy unit (3)



Types of Trauma

- ❑ Motor Vehicle Accident: most common cause of blunt trauma – 50% (1)
- ❑ Falls – 25% (1)
- ❑ Assaults/Intimate Partner Violence – 17% (1)
- ❑ Gunshot Wounds – 4% (1)
- ❑ Suicide Attempts – 3% (1)
- ❑ Others: Poisonings and Burns (1)



Trauma in Pregnancy

- ❑ Multidisciplinary approach is necessary
 - ❑ EMS
 - ❑ Trauma Surgeon
 - ❑ Emergency Physician
 - ❑ Obstetrician
 - ❑ Neonatologist
 - ❑ Labor & Delivery Nurses
 - ❑ NICU Nurses
 - ❑ ER Nurses



Trauma in Pregnancy

- ❑ Penetrating trauma, blunt trauma, and/or minor trauma can cause:
 - ❑ Placental Abruption
 - ❑ Uterine Rupture
 - ❑ Vaginal Bleeding/Loss of Amniotic Fluid
 - ❑ Fetal-Maternal Hemorrhage
 - ❑ Fetal Loss
 - ❑ Preterm Labor
 - ❑ Maternal Organ Damage
 - ❑ Fetal Organ Damage
 - ❑ Pelvic/Bone/Joint Injuries



Maternal Evaluation

- ❑ Primary Trauma Assessment
 - ❑ Typically done in the ER by ER/Trauma Physicians
 - ❑ First and foremost the stabilization of mother: focus on airway-breathing-circulation
 - ❑ Evaluation by CT Scan or other imaging modality as deemed necessary by the team; CT Scan gives approx. 10 mGy radiation; threshold exposure is 100-200 mGy depending on trimester (5)
 - ❑ Evaluate for pregnancy related issue such as Eclampsia for a potential cause of the accident



Maternal Evaluation

- ❑ Secondary Trauma Assessment
 - ❑ Assess the gestational age of the pregnancy
 - ❑ Easier with known EDC and if patient able to speak
 - ❑ Fundal Height Assessment: approx. 20 weeks with fundus at umbilicus
 - ❑ Up to 20 weeks: fetal heart tones after maternal stabilization
 - ❑ At viability age: fetal heart rate evaluation after maternal assessment and while being stabilized



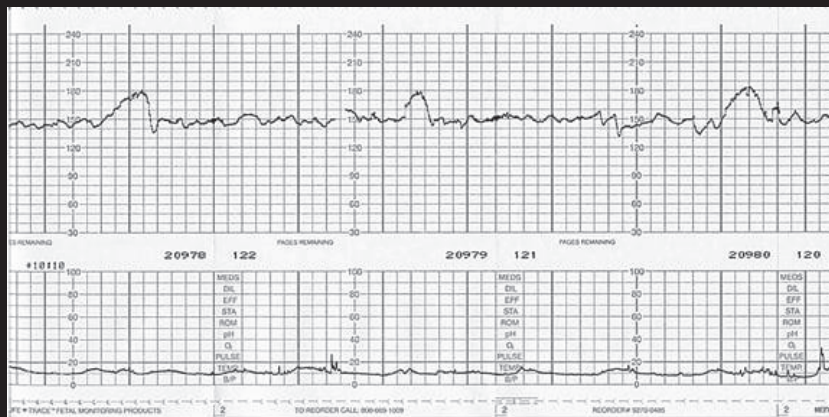
Maternal Evaluation

- ❑ Type and Cross for blood products which include whole blood or packed red blood cells (type specific or O Negative; CMV negative if available); platelets; fresh frozen plasma
- ❑ Complete Blood Count and Comprehensive Metabolic Panel
- ❑ Coagulation Studies: Thromboelastography (TEG); Blood Gas; PT, INR-PTT, Fibrinogen level, Fibrin Degradation Products
- ❑ Kleinhauer-Betke

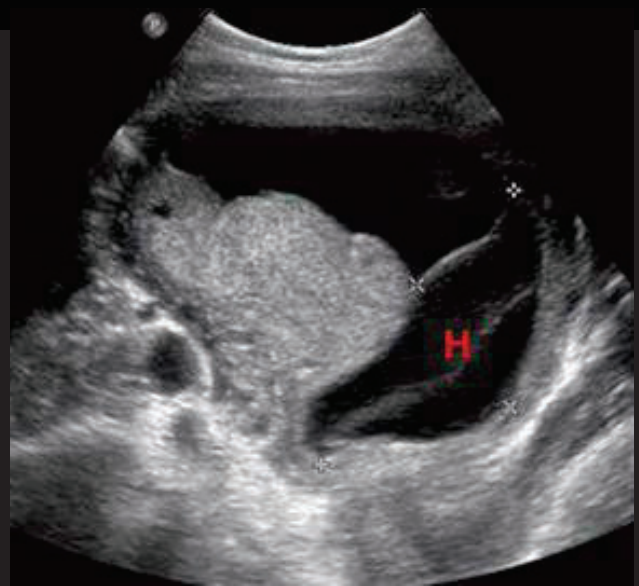
Fetal Evaluation

- ❑ Fetal Heartrate monitored by tocodynamometry for a minimum of 4 hours in a stable patient (1)
- ❑ Looking for fetal compromise which could signify uterine rupture (1%), placental abruption (50%) (6), fetal-maternal hemorrhage, amniotic fluid embolism; evaluate patient for preterm labor and/or rupture of membranes
- ❑ 100% of patients ultimately diagnosed with placental abruption had 8 or more contractions per hour in the first 4 hours (1)
- ❑ Evaluate for maternal vaginal bleeding; uterine tenderness; abdominal tenderness
- ❑ Ultrasound has low sensitivity but high specificity for placental abruption
- ❑ Fetal monitoring looking for uterine tachysystole and fetal heart rate decelerations or abnormalities

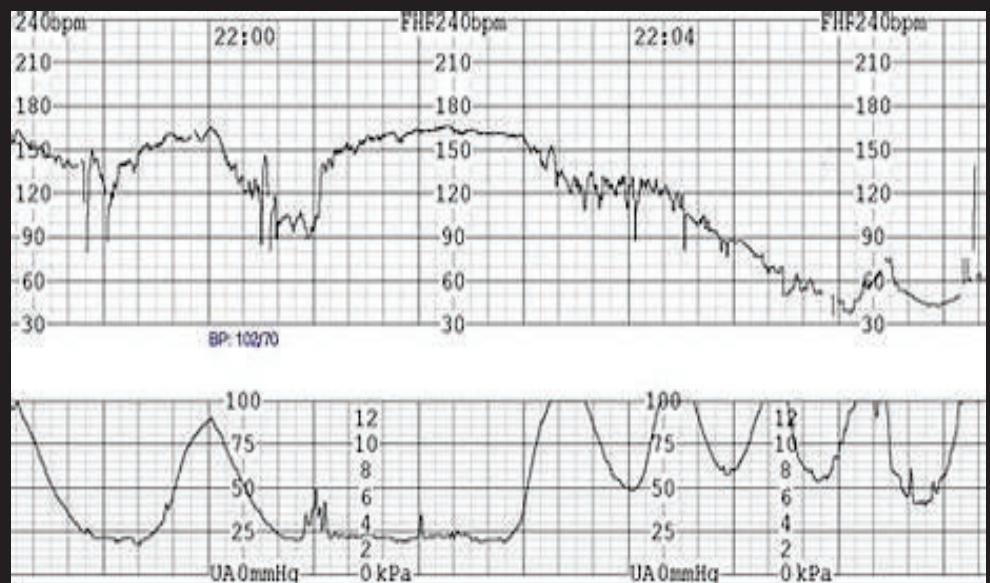
Category I Fetal Tracing



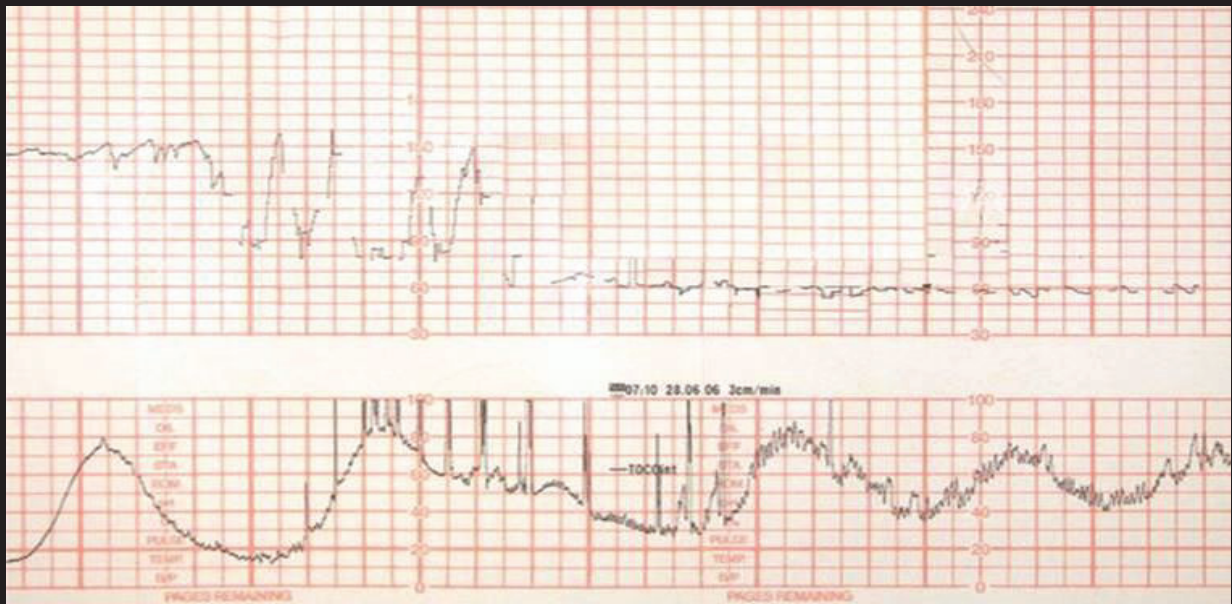
Placental Abruption



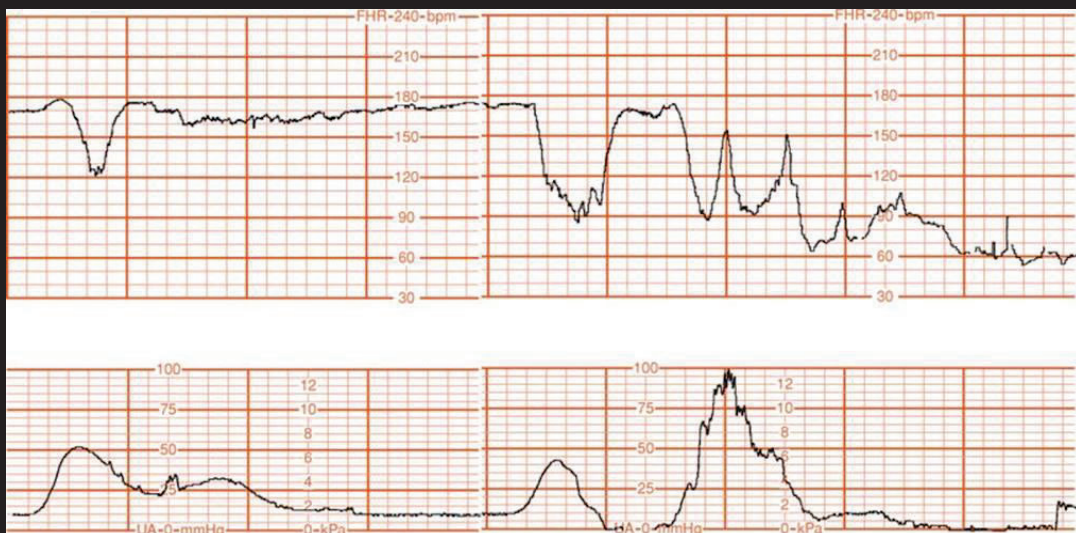
Placental Abruption



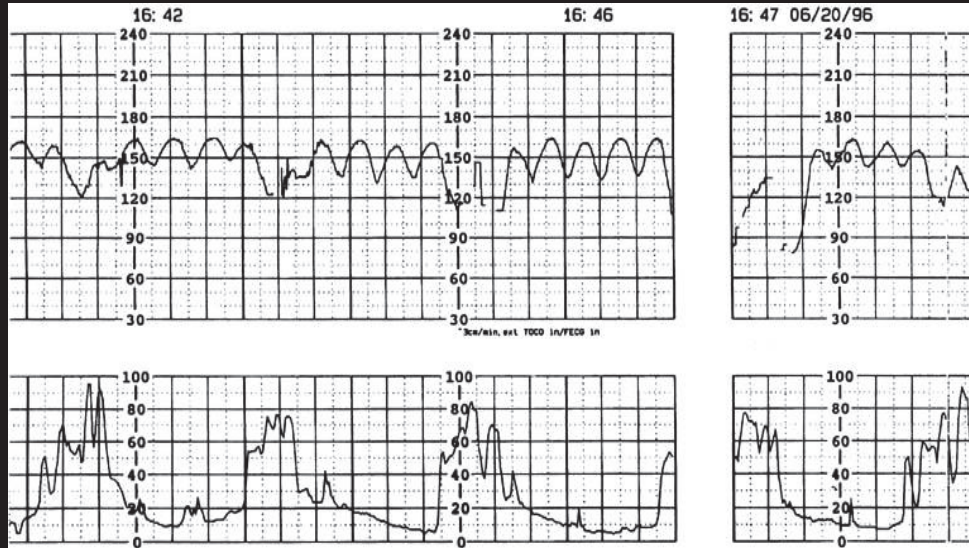
Uterine Rupture



Uterine Rupture



Fetomaternal Transfusion



Fetal Evaluation

- ☐ Give intramuscular steroids if delivery is imminent and patient is stable and gestational age is less than 36 weeks
- ☐ Rh Immune Globulin if Rh negative
- ☐ Magnesium Sulfate if Preeclampsia/Eclampsia is present
- ☐ Antibiotics for penetrating injuries
- ☐ Tdap

Maternal Trauma and Cardiac Arrest

- ❑ Follow Advanced Trauma Life Support Protocol to include defibrillation and medicines
- ❑ Uterine Displacement: 30 degree left tilt of board; manual displacement to the left
- ❑ Anatomical and Physiological Changes: (4)

Airway with increased edema and vascularity; elevated gastric pressure; increased breast size.

Respiratory with elevated diaphragm; elevated oxygen consumption; elevated minute ventilation.

Cardiovascular with decreased preload and increased afterload volumes due to aortocaval compression; increased cardiac output and blood volume; hypercoagulability; physiological anemia.

Maternal Trauma and Cardiac Arrest

- ❑ Need to be prepared to assist in resuscitation of patient
- ❑ Remember the multi-disciplinary approach
- ❑ Remove fetal monitors for CPR and defibrillation measures
- ❑ Uterine displacement
- ❑ Be prepared to perform a laparotomy for delivery of the fetus, repair of the uterus/hysterectomy if uterine rupture present; perimortem CSection

Perimortem Cesarean Delivery

- ❑ Be prepared to perform an emergency hysterotomy; this is an emotionally charged situation
- ❑ Personnel and equipment need to be available
- ❑ Survival probabilities for both patients decrease as the time from maternal arrest increases
- ❑ May save life of both patients
- ❑ American Heart Association recommends perimortem hysterotomy within 4-5 minutes if spontaneous circulation has not returned (1)
 - ❑ Increases venous return by up to 30%
 - ❑ Should be performed by the most appropriately experienced person present
 - ❑ Quickest entry into the abdomen and uterus per the experience of the surgeon
 - ❑ Gestational Age and Lower Uterine Segment development

Education and Training

"Given the rarity and potential complexity of trauma care in the pregnant patient, it is recommended of the development of clear local protocols and regular multidisciplinary training and simulation in order that best care can be provided during such scenarios" (7)



Personal Experience

- ❑ 1995 – Instructor with Texas Tech
- ❑ 1996 – Private practice in Corpus Christi, TX
- ❑ 2010 – Private practice in Amarillo, TX



References

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