Trauma in Pregnancy Assessment

Hubble text

Ob trauma chapter

EMC 420: Maternal & Child Emergency Care

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Objectives

This lecture should enable you to discuss:

- Trauma during pregnancy presents the paramedic with two patients
  - When is the appropriate time to evaluate the fetus?
  - Does the assessment of the pregnant patient with major trauma differ from that of the non-pregnant patient?
  - Is a "MAST survey" inappropriate for a pregnant trauma patient?
  - Does the evaluation of the pregnant patient with minor injuries differ from that of major trauma?

Goal of Assessment and Stabilization

- Major or minor trauma assessment do differ
- Appropriate to assess the fetus
- There are critical errors to be avoided.
- Goal : stabilization of maternal injuries
  - Achieved by adhering to "ABCs"
  - Same as with the non-pregnant patient
  - Fetal survival depends upon stabilization of mother
    - Maternal shock, unrecognized and untreated, will usually result in fetal demise

Assessing Minor Trauma

- Only critical question
  - Overwhelming majority of the cases
  - Recognition of potential placental injury.
- Critical action:
  - Transfer to an appropriate facility
  - Assessment of primary survey, VS, secondary survey, and fetal assessment
    - Uncomplicated; accomplished in min.

Critically Injured Pregnant Patient

- Only focus may be primary survey
  - Complete primary assessment and stabilization.
- Assess as any trauma patient:
  - Rapid initial survey and stabilization of VS
  - Next : maternal abdomen, uterine fundus, estimated fetal age, and fetal heart rate are considered
  - Then : secondary survey can be completed

Priorities of Assessment and Stabilization

- Primary survey / fetal survey / secondary survey.
- Order of priorities same as always CABCDE:
  - C - Cervical spine
  - A - Airway
  - B - Breathing
  - C - Circulation
  - D - Disability
  - E - Expose; *and then consideration may be given to*
  - **F** - ***F*** undus / ***F*** etal age estimate / ***F*** etal heart rate

Anatomic and Physiologic Changes and Assessment

- Cardiopulmonary changes:
  - High cardiac output
  - High oxygen demand
  - Low pressure (low PVR)
  - Low, or impeded, venous return
  - Low O2 reserve
- Effect of these changes on maternal assessment depicted in table 25-4

Method of Assessment in Pregnancy

Systemic progression of assessment and stabilization

- Scene
  - While approaching : preliminary 1-5 sec. look
  - Labored or inadequate respirations
  - Obvious hemorrhage or abnormal color
  - Confusion or unresponsiveness
  - Obviously gravid abdomen

CABCDE Priorities in Assessment in Pregnancy

- Cervical Spine
  - Any mechanism of injury,… in-line manual stabilization of cervical spine
- Airway
  - Aggressive management particularly important in the pregnant trauma patient
    - Risk of aspiration and limited O2 reserve
    - Protection may require RSI when indicated

Breathing

- Adequacy of respiratory rate and depth
  - Normally hyperventilatory
  - Respiratory rate of less than 20
    - Considered potentially dangerous
- Unequal breath sounds (pneumothorax, ruptured diaphragm, or pulmonary contusion)
  - Pneumothoraces even more life threatening because of elevation of diaphragm and decreased O2 reserve.
  - Tension pneumothorax : precipitous because of hyperventilation combined with elevation of the diaphragm

Tension Pneumothorax

Timely management:

- Requires early recognition:
  - Unequal breath sounds
  - Neck vein distension
  - Declining BP
  - (Tracheal deviation : perimortem sign.)
- 4 cm elevation of diaphragm
  - Lateral needle stick runs risk of causing an intra-abdominal injury

Circulation

- Usual estimates subject to misinterpretation
- Extensive internal hemorrhage : without demonstrating usual signs of shock
  - HR, capillary refill, color and temperature, and BP : poor predictors of amount of blood loss
  - full pulse, normal skin, and ***slight confusion*** may have actually lost ***30 %*** blood volume
- Checking position of uterus
  - Failure to assess for IVC compression (and relieve) :
    - Catastrophic drop in cardiac output

Disability

- Neurological : not altered by changes of pregnancy
- Pupils : asymmetry
  - Indicating impending herniation
  - Need for hyperventilation
- Usual AVPU evaluation
  - Same potentially reversible causes of ALOC:
    - Cerebral hypoxia
    - Cerebral hypoperfusion
    - Hypoglycemia

Exposure

- Do not fail to identify an obviously gravid uterus
  - Gross error
    - Can be avoided by simply following usual trauma life support practice :
      - Completely removing patient's clothing
- Inspected for signs of penetrating or blunt injuries not already detected

Priorities of Assessment and Stabilization

- 1st : primary survey
- 2nd: fetal survey, and
- last: secondary survey

- Order of priorities remains same : CABCDE
- Then, and only then, consider :

F - **F** undus / **F** etal age / **F** etal heart rate

Initial Obstetric Examination - Fetus (and Fundus)

- After patient's condition stabilized
  - Adequate O2, control of external hemorrhage, and adequate volume restoration
- Next attend to out-of-hospital obstetric assessment (before secondary survey).
  - Initial obstetric examination : a protocol for trauma assessment in pregnancy
  - "F" evaluation will replace MAST survey
    - Assess uterine fundus, quick check for obvious vaginal blood or fluids, fetal evaluation - as much as possible in out-of-hospital setting

Prehospital Fetus (and Fundus) Assessment

- Critical questions are (3) :
  - Is there uteroplacental injury?
  - Is the fetus of viable age?, and
  - Is there fetal distress?
- Critical actions are (3) :
  - Palpate the uterine fundus,
  - Estimate fetal age, and
  - Attempt to auscult fetal heart tones
- These steps inappropriate if maternal VS stabilized

Inspection and Palpation

- Brief (2-3 sec.) check : obvious vaginal blood or fluids
- Palpating uterine fundus
  - For tenderness and rigidity
    - Serious uteroplacental injury, such as abruptio
      - Vaginal bleeding and uterine findings are **not** sensitive or specific for abruptio
  - Fundus should be well defined dome
    - Non-definable uterine fundus may indicate
      - Uterine rupture or
      - Significant intra-abdominal bleeding

Estimating Fetal Age

- Distance (cm) : pubic symphysis to dome of fundus approximates age of fetus in wks
  - 36 cm (at xiphoid)
  - 20 cm (at umbilicus)
  - 12 cm (above the pubic symphysis)
- If fundus clearly extends well above umbilicus
  - Fetal age is est. ≥26 weeks
    - Indication of fetal viability
    - (For most neonatal facilities, this occurs after 25 wks, or a wt of approximately 750 gms)

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Assessing Fetal Distress

Prior to reaching ED

- Fetal movement indicates potential viability
- But methods of assessing fetal distress are limited
  - Briefly attempt to detect fetal heart tones (FHTs) and palpate the fundus for fetal movement
    - Fetal heart beat can be detected during last mo of pregnancy using ordinary stethoscope (bell of firmly in periumbilical area)
    - Paramedics with doppler ultrasound may easily assess fetal heart rate after 20 weeks

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Fetal Distress

- Normal fetal heart rate : 120 -140 bpm
- Early sign of fetal distress : rate above 160 bpm
- Sustained bradycardia (below 110 bpm) - ominous sign
  - Abruptio placenta
  - Fetal hypoxia / Fetal brain injury
- Fetal distress : may be earliest sign of occult maternal hemorrhagic shock
  - More reliable sign of shock than other maternal vital signs
  - Fetal heart rate : "another maternal vital sign"

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FHT Monitoring in ED

- Mandatory monitoring : in all pregnant trauma patients > 20 weeks gestation
- Fetal distress (and not abdominal pain, tenderness, and vaginal bleeding)
  - Can be first indication of abruptio placentae
- Fetal distress may be earliest sign of occult maternal hemorrhagic shock
  - Since fetal distress is a more reliable sign of shock than other maternal vital signs

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Secondary Survey

- After initial assessment
- After maternal VS have been stabilized
- After fetal and fundus assessment
- Then remainder of assessment (for fractures and internal injuries) may proceed
- Secondary survey in pregnant trauma patient :
  - Essentially the same as for the non-pregnant with a few differences
    - Abdomen
    - Pelvis

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Abdomen

- Size of the near term uterus
  - Can obscure adequate assessment of abdomen
- Absence of peritoneal signs
  - Usual non-pregnant signs of peritoneal irritation and intra-abdominal bleeding : frequently absent

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Pelvis

- Check vaginal and perineal areas :
  - Blood and amniotic fluid
- Adequate bony pelvis exam
  - Omission may result in failure to detect pelvic fracture
    - frequent cause of hypovolemic shock and death in MVC patients

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Summary

- CABCDEF priorities
  - Treatment (same priorities discussed in assessment)
    - Ensure adequate maternal and fetal
      - Oxygenation and perfusion
    - Maternal VS reassessed
    - FHTs - if possible, reassessed
      - Should never supersede maternal assessment
- Focus on primary assessment
  - Detect and stabilize pathophysiology of life-threatening maternal and fetal conditions

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