The Pregnant Pause

Guidelines for managing the pregnant trauma patient

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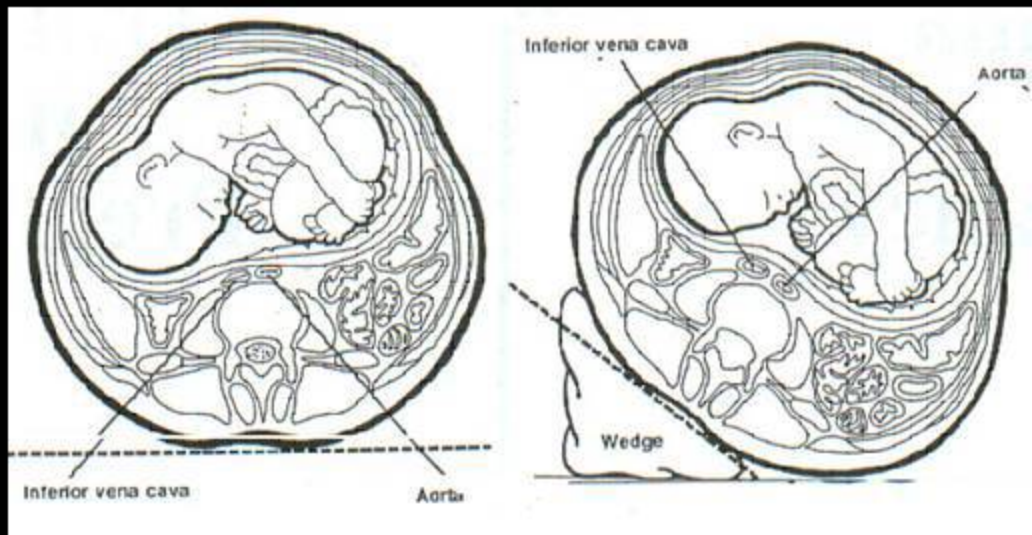
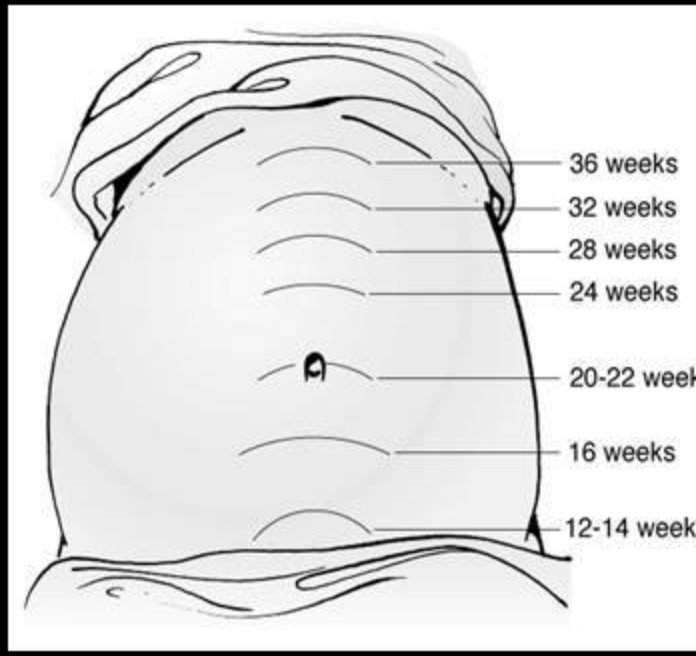
Primary Survey

- Same principles as non-pregnant
- AIRWAY
  - 8x rate of failed intubation[1]
  - Increased risk of aspiration
- BREATHING
  - Careful chest tube placement
  - Liberal use of oxygen
- CIRCULATION
  - 15° left lateral tilt



Secondary Survey

- ß-hcg in all females under 50
- Obstetric history
  - Viable fetus = >24 weeks
- Obstetric consult
  - Pelvic exam
- Kleihauer-Betke test
  - 8-30% FMH
  - Predictor of preterm labour
- Rhogam in Rh $^{-}$ mothers

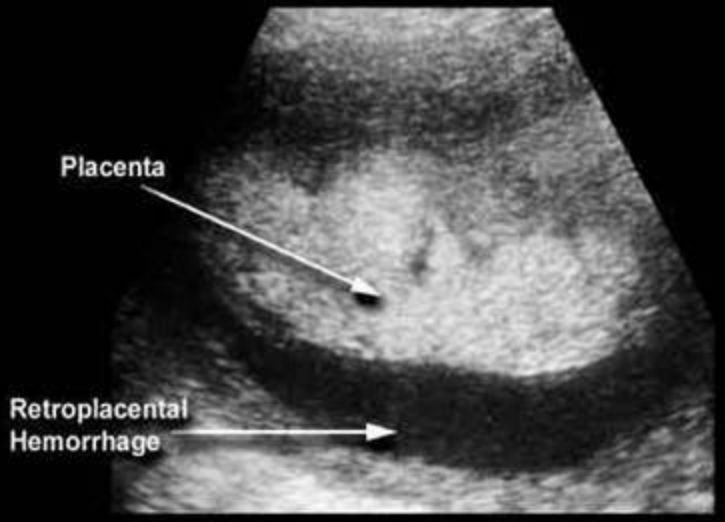


Fetal Assessment

- Main risks:
  - Preterm labour
  - Placental abruption
- Uterine tenderness/contractions
- Vaginal bleeding
- Fetal heart tones
- CTG monitor x 4-6 hours
  - If >24 wks
- Ultrasound

Placental Abruption

- 2-4% of minor trauma
- Up to 50% of major trauma
- 20-35% fetal mortality
- Signs:
  - Fetal distress by CTG
  - Vaginal bleeding, cramps
  - Uterine tenderness
- U/S picks only half
- TX: abruption + distress
  - = immediate delivery

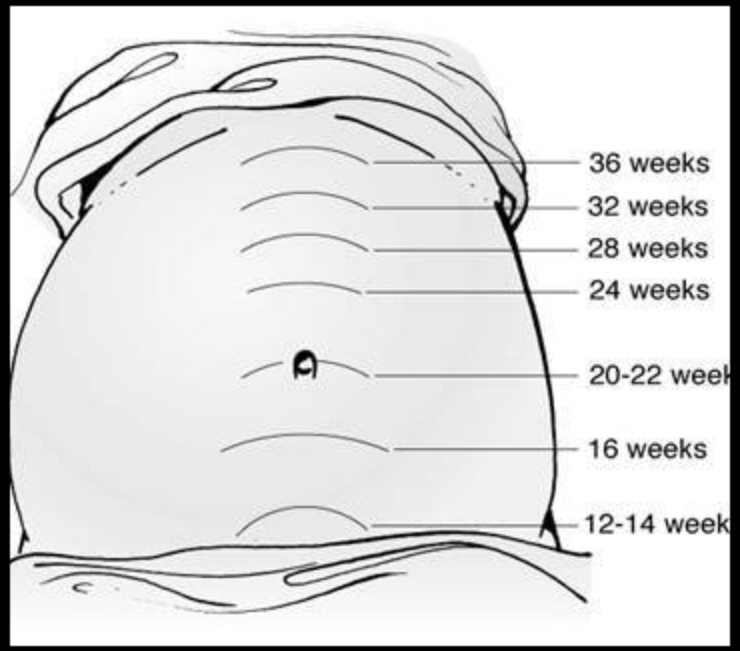


Alarm bells

- urgent obstetric review for >24 wks and:
  - vaginal bleeding
  - uterine irritability
  - abdominal tenderness
  - pain
  - cramping
  - absent fetal heart tones
  - leaking amniotic fluid

Secondary Survey
Special Considerations

- Obstetric history – accurate dates
- Anti-D (Rhogam) if Rh-
  - Kleihauer test
- Further imaging?



Diagnostic workup

- We are highly dependent on imaging as an adjunct to physical examination
- BUT, we are concerned about birth defects from ionizing radiation
- How do we manage risk vs benefit of imaging the pregnant patient?

Overview

2 important factors

1. EXPOSURE: most x-rays pose minimal risk
2. BACKGROUND RISK: of all pregnancies is of 3% for major birth defects and 15% for miscarriage.

Risk to foetus

- Most diagnostic procedures expose the foetus to < 5 rad
- < 5 rad will not increase reproductive risks (birth defects or miscarriage).
- the reported dose of radiation to result in an increased incidence of birth defects or miscarriage is > 20 rad.

Imaging - data

- Radiation to fetus 1/3 that of mother
- Risks: death, birth defects, LBW, leukemia
- < 5 rad *definitely* safe
- <10 rad probably safe

Study	Fetal rads
CXR	0.005
PXR	0.4
CT head	0.05
CT chest	0.1
CT A/P (10mm)	12

from EAST practice management guidelines

Risk from *non*-abdo/pelvis exam

- When a diagnostic x-ray study (including CT) is of the head, neck, chest, or limbs, the radiation exposure is not to the fetus.

- Scatter that might reach the fetus is miniscule and would not represent an increased risk for birth defects or miscarriage.

If the foetus is exposed

- The patient must be informed about the magnitude of the radiation dose to the embryo/fetus and counselled about any potential risks.
- The practitioner must not, on purely physical considerations, recommend a termination of the pregnancy

Summary

- There is no reason to avoid use of non-abdo CT to evaluate a pregnant trauma patient
- CT will provide more accurate diagnostic information than any other procedure and will allow the mother the best chance for survival and completion of the pregnancy
- Decisions about abdo or pelvic imaging should be made at a senior level and with multidisciplinary input

Imaging - recommendation

- Image pregnant women as needed
- Plain x-rays are safe
- CT head and c-spine are safe
- Shield abdomen
- Use ultrasound over CT for abdominal imaging when possible
- Exposure is higher with fluoroscopy
- Mother still comes first

Perimortem caeserian

- Conventional CPR is less effective
- Open chest CPR may be indicated
- No CPR is effective if heart is empty
- Consider peri mortem Caesarian if
  - Uterus is above umbilicus or viable fetus
    - >26 weeks
  - Evidence of heart activity
  - CPR for no longer than 10 mins
- Outcomes
  - 50% live birth rate
  - Time delays = neurological sequelae
  - Long term survival rate 5%

Acknowledgements

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Epidemiology

- Trauma affects 8% of pregnancies
- Trauma admission in 1/250 pregnancies
  - 50% road trauma
  - 22% falls
  - 22% assault
- 80% fetal mortality if maternal shock

Changes in Pregnancy

- Physiology
  - Increased plasma volume, HR, CO
  - Decreased BP, FRC, gastric emptying
  - Supine hypotension syndrome
  - Hypercoagulable state
  - Uteropelvic blood flow
- Anatomy
  - Enlarged uterus
  - Raised diaphragm
  - Stretched peritoneum

IN A NUTSHELL:

You look after the fetus
by looking after the mother

Priorities

- Primary survey (mother)
- Foetal assessment
- Secondary survey of mother
- Definitive care of both patients