Evaluation of the Placenta and Cervix

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Everything you need to know in 15 minutes!

Overview

• Amniotic fluid
• Placenta
• Umbilical cord
• Cervix
• Membranes

Amniotic Fluid

• Definitions
• Classification

Amniotic fluid volume

• Increases logarithmically first ½ pregnancy
• < 10 mL @ 8 weeks gestation
• 630 mL @ 22 weeks gestation
• 770 mL @ 28 weeks gestation
• 30-36 weeks: volume stable or slowly inc
• > 36 weeks: volume decreases
• 41 weeks: 515 mL
• Decreases 33% each week after 41 weeks

Creasy & Resnik: Maternal Fetal Medicine
**AFI: Amniotic Fluid Index**

- **Definition:** Summation of the deepest vertical pocket (DVP) in 4 cord and extremity-free quadrants of the gravid uterus
  - Oligohydramnios: < 5 cm
  - Polyhydramnios: > 24 cm

**Oligohydramnios**

- **Definition:** Condition in which the amniotic fluid volume (AFV) is decreased relative to gestational age.
- Or: AFI < 300-500 mL in 2nd trimester
  - MVP < 1-2 cm
  - AFI < 5 cm
  - AFI < 5% of expected

**Oligohydramnios**

- Almost always associated with an increased risk of fetal morbidity and mortality
**Oligohydramnios: Causes**
- Renal: agenesis, obstruction
- Uteroplacental insufficiency/ IUGR
- Ruptured membranes
- Post term pregnancy
- Unknown

**Oligohydramnios**
- Associated with guarded outcome
- Highly associated with anomalies
- Not universally fatal, depends upon gestational age at onset (after 26 weeks, fetus may have enough pulmonary development to survive)

**History**
- 19 weeks 2 days gestation
- Referring dx: bilateral renal agenesis, oligohydramnios
- Family hx: Branchio-oto-renal syndrome

**Branchio-Oto-Renal Syndrome:**
- BOR; Melnick-Fraser Syndrome
- Autosomal dominant
- Variable expression and penetrance
- Chromosome 8q13.3; EYA1 gene
- **Renal:** dysplasia, aplasia, polycystic kidney, reflux

**AFI**
- AFI: 3.82 cm
- LUQ: 0.72 cm
- LLQ: 0.32 cm
- RUQ: 1.49 cm
- RLQ: 1.29 cm

**UAs: no fluid in bladder**
Polyhydramnios

• Definition: Excessive accumulation of amniotic fluid at some time during pregnancy
  • Greater than 1500-2000 mL
  • Deepest vertical pocket > 8 cm

• Often associated with an increased risk of fetal morbidity and mortality

Polyhydramnios: Causes

• Idiopathic
• LGA fetus
• Impaired swallowing (neck mass, EA/TEF, DA, CPAM
• Chromosomal
• Neurologic

Polyhydramnios: Causes

• CNS: ie, anencephaly
• Gi: Esophageal atresia
• Respiratory: CCAM
• GU: Mesoblastic nephroma
• CV: Ebstein anomaly
• MSK: Fetal akinesia/hypokinesia syndrome

Placenta
Placenta
- Normal sonographic appearance
- Normal thickness
- Previa types
- Accreta types
- Cysts, masses, molar change
- Chorioamniotic separation
- Amniotic bands, senechiae

Placenta: normal appearance
- Thickness: less than 5 cm
- Attachment site: anywhere
- “Matures” during gestation (Type 0-3)
- Placental lakes
- Accessory lobes

Placental cord insertion site
- Central
- Eccentric
- Velamentous

Position of placenta in relation to internal os of cervix
- Low-lying
- Marginal previa
- Central previa
- Vasa previa

Invasive placenta
- Increased with previous C-section
- Previous uterine surgery
- Difficult to diagnose
- Treatment options: methotrexate, uterine artery embolization, hysteroscopy, gravid hysterectomy

Invasive placenta
- Accreta (80%): superficial invasion chorionic villi
- Increta (15%): deep myometrial invasion
- Percreta (5%): full thickness invasion of myometrium, often into adjacent bladder
Abnormal placenta

- Trophoblastic disease
- Masses: cystic and solid
- Hydropic change

Umbilical Cord

Cord Issues

- Number of vessels
- Cord length
- Coiling index
- Cord insertion sites: fetus, placenta
- Cord position in relation to fetus
- Cord masses: fetal end, placental end, free-floating cord

Umbilical cord cysts

- Usually benign, but not always
- Most often on the fetal end
- Represent remnants of allantoic duct (urachus) or vitelline duct

Case of urachal remnant

Importance of cord insertion site

- Into fetal abdomen
- Into placenta
Abnormal cord insertion sites

- Eccentric
- Marginal
- Velamentous

Cord

- 2 vessel, 3 vessel, more
- Umbilical cord cysts
- Umbilical cord varix
- Short cord
- Coiled, uncoiled
- Nuchal cord

Nuchal cord

- ~25% of pregnancies have a “single” nuchal cord
- ~2% have “double” nuchal cord
- 0.3% have a triple nuchal cord
- <0.1% have a quadruple cord

Single umbilical artery

- Incidence: 1% live births
- Association with anomalies

Cervix
Cervix

- Normal anatomy
- Expected changes during pregnancy
- Normal length
- Short cervix
- Open cervix
- Imaging of the cervix: TA US, TV US, MRI

Normal cervix = 3 cm or longer

Note: central cord insertion

22w Cervix: long and closed, no funnelling

Cervix length can change!

Gold standard = transvaginal sonography

Warning!

- Evaluation of placenta, cervix and amniotic fluid is not just for coding purposes
- Critical to good outcome for the pregnancy
- Treat woman carrying an anomalous fetus like any other pregnant woman: maternal and fetal well-being first and foremost, before anomaly evaluation
Report of major impact: Asymptomatic short cervix
Vaginal progesterone in women with an asymptomatic sonographic short cervix in the midtrimester decreases preterm delivery and neonatal morbidity: a systematic review and metaanalysis of individual patient data

Universal cervical length screening and vaginal progesterone
- Prevents preterm births
- Reduces neonatal morbidity
- Reduces health care costs
- “Doing nothing is no longer an option.”
  - Stuart Campbell

Membranes
- Chorioamniotic separation
- Amniotic bands

Amniotic bands
- “Sticky” side of amnion attaches to fetus
- Unusual clefts, defects

Significance of chorioamniotic separation
- Guarded outcome
- Depends upon whether it is spontaneous (worse) or after an intervention (better)
- Can re-seal

Review
- Amniotic fluid
- Placenta
- Umblical cord
- Cervix
- Membranes