**Ultrasound Evaluation Of the Cervix**

Mani Montazemi, RDMS

Clinical Instructor – Imaging Manager
Baylor College of Medicine
Division of Maternal-Fetal Medicine
Department of Obstetrics and Gynecology
Texas Children’s Hospital, Pavilion for Women
Houston Texas

**Evaluation of the Cervix**
**Predicting Preterm Delivery**

- Digital
- Fetal Fibronectin
- Ultrasound

Transabdominal
Translabial
Transvaginal

**Least** accurate method to measure cervical length & to identify a cervical funnel


Filling of the Bladder For Pelvic Sonograms
Beryl R. Benacerraf, MD

**Lower Uterine Segment**
Transabdominal Examination

Pitfalls

- Presenting fetal part
- Bladder distension
- Symphysis pubis cartilage
- External os not visible
- Critical angle artifact
- Large maternal body habitus
- Lower uterine contraction

Placenta Previa: False Positives

Over distended bladder can compress the lower uterine segment to give the appearance of an anterior previa

Transabdominal Examination

Pitfalls

- Presenting fetal part
- Bladder distension
- Symphysis pubis cartilage
Transabdominal Examination

Pitfalls
- Presenting fetal part
- Bladder distension
- Symphysis pubis cartilage
- External os not visible

Transabdominal Examination

Pitfalls
- Presenting fetal part
- Bladder distension
- Symphysis pubis cartilage
- External os not visible
- Critical angle artifact

Transabdominal Examination

Pitfalls
- Presenting fetal part
- Bladder distension
- Symphysis pubis cartilage
- External os not visible
- Critical angle artifact
- Large maternal body habitus
- Lower uterine contraction

Lower Uterine Segment Contraction
Post Void

- Are common!
- These contractions are very slow & long

Placenta Previa: False Positives

“Contractions”
If indicated, the cervical length should **ALWAYS** be measured with transvaginal approach.

**Common Indications for TV Evaluation of Cervix**

- Evaluating patients with vaginal bleeding to look for placenta previa
- Fetal parts
- Diagnosing cervical incompetence
- Assessing cervical effacement and dilation in patients with preterm labor
- Multiple Gestations
- Post cerclage placement
- History of preterm labor
- Succenturiate lobed placentas
- Velamentous cord insertion

**Preterm Delivery**

Whether that’s due to incompetent cervix or preterm labor leading to preterm birth is the single most common cause of poor neonatal outcome.

**Preterm Delivery**

- Effects 8% of births
- Accounts for 15 – 20% of neonatal deaths
- 75% of non-anomaly deaths
- Treatment > $5 billion/yr USA

**Transvaginal Approach**
**Transvaginal Approach**

Mani Montazemi, RDMS
Ultrasound of the Cervix

**Anatomic Landmarks for Vaginal Sonography**

- Bladder
- External Os
- Cervical Length
- Internal Os
- Chorioamnion Membrane

"Minimizing the effect of excess pressure"
Good midline sagittal view of the cervix

**Transvaginal Approach**

Mani Montazemi, RDMS
Ultrasound of the Cervix

"Be careful - Excess Pressure"

**Transvaginal Approach**

Mani Montazemi, RDMS
Ultrasound of the Cervix

"Wall of the vagina"
Cervical Length

- Upper limit of normal: 5.0 cm
- Average: 4.0 cm
- Lower limit of normal: 3.0 cm
- Pathologically decreased: 2.0 cm
“One step” vs. “Two step” Technique

Straight or Curved

Curved Cervix

If height ≥ 5 mm → “two step” technique

Cervical Changes

Essentially the same in
- Term labor
- Preterm labor
- Cervical incompetence

Cervical Changes

• T
• Y
• V
• U

Trust
Your
Vaginal
Ultrasound
Cervical Changes

• Dilation
  – Widening of the endocervical canal from side to side

• Effacement
  – Shortening of the cervix
  – Reduction of the cervical length from internal end to external end

• Funneling or Beaking
  – Extension of amniotic fluid for some variable distance (≥ 5mm) into the endocervical canal from internal os toward external os
    – ‘V’ shape
    – ‘U’ shape

• Posterior – caudal
    – Bulging membranes
Cervical Changes

- Funneling or Beaking
  - Extension of amniotic fluid for some variable distance (≥ 5mm) into the endocervical canal from internal os toward external os
  - ‘V’ shape
    - More common, triangular “notch” at the internal os
  - ‘U’ shape
    - Uncommon, typically larger than V-shaped variety
    - Usually deeper than it is broad and may be dynamic

Cervical Beaking – V Shape

Cervical Funneling – U Shape

Cervical Funneling

- Funnel Length
  > 1.6 cm
- Cervical Length
  < 2.0 cm
- Funnel Width
  > 1.4 cm

Diagnostic Challenge
Cervical Changes

- Posterior → Caudal
  - In the early to mid pregnancy the cervix points posteriorly toward the sacrum
  - As the woman progresses towards labor the cervix starts to rotate to line up with vagina
Cervical Changes

- Bulging of membranes
  - Fluid extends all the way to the external os
  - If into vagina, delivery likely unstoppable

Preterm Labor
“to evaluate for cervical dilation”

Diagnostic Challenge

Cervix – Dynamic Changes

Cervical Change
is Dynamic!
Mani Montazemi, RDMS
Ultrasound of the Cervix

Cervix – Dynamic Changes

Cervical Stress Test with Gentle Pressure

Don’t…

• Use cervical ultrasound as a screening test
Don’t...

- Rely upon transabdominal ultrasound to measure length to identify a funnel. It is not reproducible because of the variable pressure created by the maternal bladder.

Don’t...

- Measure cervical length before 16 weeks, too much variation to be useful.

Introduction to Ultrasound Evaluation of the Cervix

Thank You

Diagnostic Challenge

Vasa Previa

- Partial or complete obstruction of the internal cervical os by blood vessels.
**Vasa Previa**

- Low lying placentas;
- Succenturiate lobed placentas;
- Velamentous cord insertion;
- Multiple pregnancies;
- Pregnancies resulting from IVF

**Risk Factors**

**Placenta Previa**

- **Marginal**
  - Inferior edge of placenta within 2 cm of IO
  - Often resolves with advancing pregnancy

- **Partial**
  - Edge of placenta partially covers IO
  - Difficult to differentiate from marginal previa
  - Often resolves with advancing pregnancy

- **Complete**
  - Asymmetric complete previa
    - Small part of placenta crosses IO
    - May resolve with advancing pregnancy
    - If > 1.5 cm crosses IO then less likely to resolve
  - Symmetric complete previa
    - Placenta centrally implanted on cervix
    - Will not resolve with advancing pregnancy

- **Low lying placentas**
- **Succenturiate lobed placentas**
- **Velamentous cord insertion**
- **Multiple pregnancies**
- **Pregnancies resulting from IVF**
It is recognized that apparent placental position early in pregnancy may not correlate well with its location at the time of delivery.

"Trophotropism"
- The ability or the desire of the placenta to seek a blood supply
- Proliferation of placental villi in areas of better blood supply (corpus, fundus)
**Succenturiate lobe**

- May be low-lying or cross internal os

**Trophotropism**

**Trophotropism**
Introduction to Ultrasound
Evaluation of the Cervix

Thank You