Ultrasound and Cervical Incompetence

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Agenda

- I. Ultrasound
- II. Patient Presentation
- III. Cervical Incompetence
- IV. Supplemental Patient Presentation
Ultrasound- Overview

- Electricity within a transducer produces sound waves.
- Tissues receive the waves and either attenuate, transmit, or reflect them to different degrees.
- Reflected waves-echoes- are received by the transducer at interfaces and combine to create an image of the scanned sector.
Ultrasound- Overview

- Echoes from tissues of high acoustic impedance mismatch are stronger.
- **Echogenic**- has internal echoes, appears white (bone, air).
- **Anechogenic**- lacking internal echoes, appears lucent (clear fluid).
Ultrasound - Indications

- Throughout pregnancy:
  ~ Gestational Age
  ~ Placental Evaluation

- Complications by trimester

- Maternal Disorders
Ultrasound- Indications (Cont.)

- Guidance for amniocentesis and chorionic villus sampling
- Pregnant women who develop:
  - Vaginal Bleeding
  - Pelvic Pain
  - Premature labor
  - Trauma
Ultrasound—Advantages

- No ionizing radiation
- Transaxial, sagittal, and oblique planes
- Cheaper than CT and MRI
- Portable
- “Real time”
Ultrasound-Female Reproductive Anatomy

Source: www.ynhh.org/pat_edu/hysterectomy/why.html
Ultrasound Techniques
Transvaginal

- Transducer is introduced to the midvagina

Source: BIDMC PACS
Ultrasound Techniques
Transvaginal (Cont.)

Advantages:
- Earlier detection of pregnancy
- Earlier evaluation of fetal milestones
- Distended bladder not required
- Better evaluation of cervix
- Higher resolution of images
Ultrasound Techniques

Transabdominal

- Transducer sends signals through abdomen

Uterus
Endometrium
Cervix
Endocervical canal
External Os

Source: BIDMC PACS
Ultrasound Techniques
Transabdominal (Cont.)

- Advantages:
  - Images available in transaxial, sagittal, and oblique planes of view
  - Noninvasive
  - Better 3rd trimester visualization
Patient L.S.
2/25/02

- 40 year old woman with a twin pregnancy comes to BIDMC for a well being check.
- HPI - gestational age 33 weeks.
- PMH - positive for DES exposure.
Patient L.S.- Transabdominal Ultrasound

- Uterus
- Urinary Bladder
- Endometrium
- Cervix
- Endocervical canal
- External os

Sources: BIDMC PACS
Patient L.S.- Transvaginal Ultrasound

Endometrium

Uterus

Cervix

Endocervical canal

Normal

L.S.

Sources: BIDMC PACS
Patient L.S. - Ultrasound Findings

- Ballooning of cervix
- Opening of internal and external os
- 1cm echogenic focus posteriorly at level of external os
- No measurable closed cervix
Patient L.S.- Ultrasound DDx

- Mucus plug
- Polyp
- Cervical Incompetence

- Diagnosis: Cervical Incompetence
Cervical Incompetence

- **Definition** - passive and painless dilatation of the cervix in the 2\(^{nd}\) trimester
- **Incidence** - 0.2-2 of every 1000 pregnancies
- **Etiology** - Congenital (DES exposure) or Acquired (trauma)
- **1\(^{st}\) presentation** - pelvic pain, low backache, vaginal discharge (w/ or w/o blood)
Cervical Incompetence (Cont.)

- **US findings** - shortened cervix, funneled internal os from inside out, endocervical ballooning
- **Diagnosis** - established by an obstetric history of cervical dilation in the 2\(^{nd}\) trimester
- **Complications** - membrane rupture, delivery of immature fetus, pregnancy loss
- **Treatment** - cerclage (if possible) and prophylactic cerclage in subsequent pregnancies
Cervical Incompetence - Treated by Cerclage

Cerclage sutures

Funneling endocervical canal

Source: BIDMC PACS
Prophylactic Cerclage

Placement of sutures for McDonald cervical cerclage. **A**, We use a double-headed Mersilene band with four "bites" in the cervix, avoiding the vessels. **B**, The suture is placed high upon the cervix close to the cervical-vaginal junction, at the level of the internal os.

Source: Obstetrics-Normal and Problem Pregnancies
Patient K.P.
6/10/02

- A 33 year old pregnant woman comes to BIDMC for follow-up ultrasound.
- HPI - at last visit fetal size was less than gestational age by ultrasound.
Patient K.P.-Transvaginal Ultrasound

- **Findings**
  - Ballooning of the cervix
  - Closed cervical length of 5 mm
  - Size equals dates

Source: BIDMC PACS
K.P.

- Diagnosis- Cervical Incompetence
- Treatment- Cerclage
Summary

I. Ultrasound
A. Overview
B. Indications
C. Advantages
D. Anatomy
E. Techniques
   1. Transvaginal
   2. Transabdominal

II. Patient L.S.
A. History
B. US Findings
C. DDx
Summary (Cont.)

III. Cervical Incompetence

A. Definition
B. Etiology
C. Presentation
D. US Findings
E. Diagnosis
F. Complications
G. Treatment- Cerclage

IV. Patient K.P.

A. History
B. US Findings
References

- www.ynhh.org/pat_edu/hysterectomy/ why.html
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Dedication

- This talk was inspired by and is dedicated to the loving memory of Nyla.