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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
 - ~ IUP/Viability
 - ~ Fetal Survey
- 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

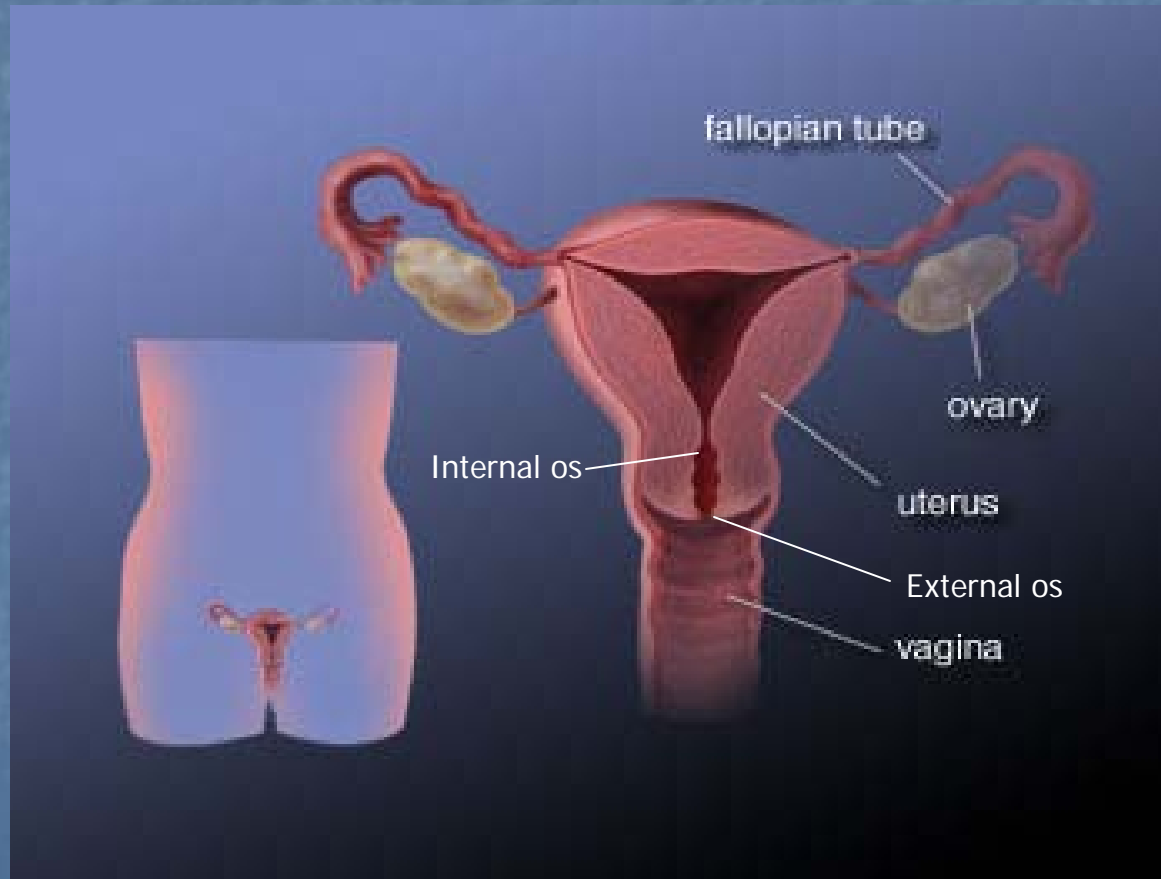


Ultrasound- Advantages

- No ionizing radiation
- Transaxial, sagittal, and oblique planes
- Cheaper than CT and MRI
- Portable
- "Real time"



Ultrasound-Female Reproductive Anatomy

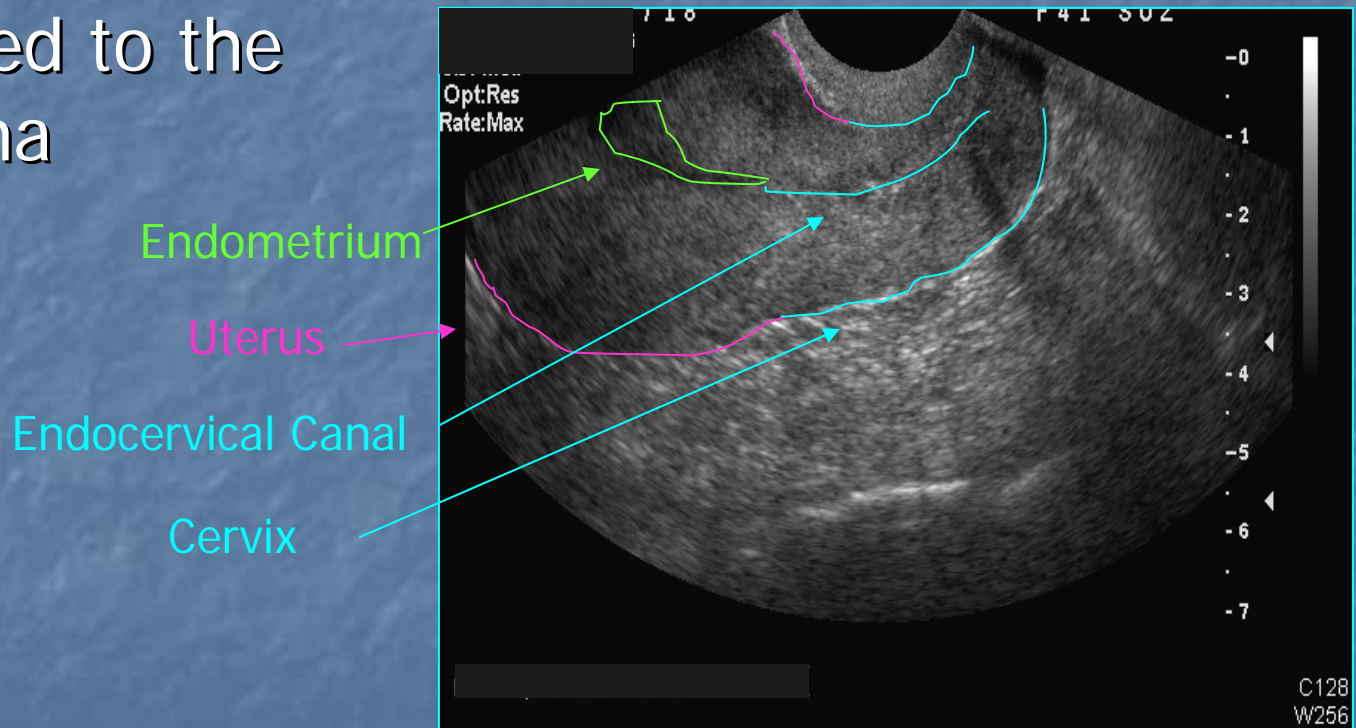


Source: www.ynhh.org/pat_edu/hysterectomy/why.html



Ultrasound Techniques Transvaginal

- Transducer is introduced to the midvagina



Source: BIDMC PACS



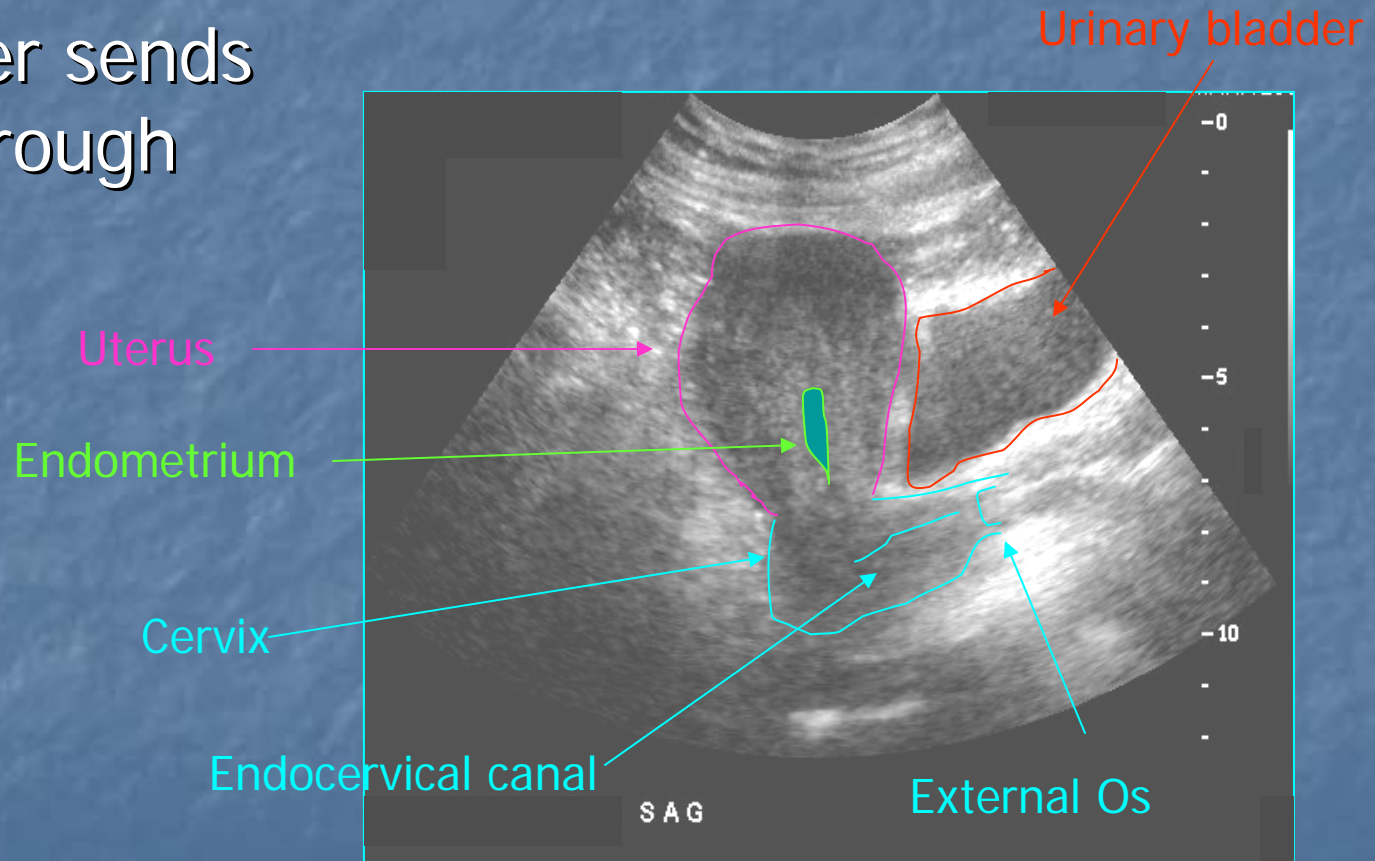
Ultrasound Techniques Transvaginal (Cont.)

- 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



Source: BIDMC PACS



Ultrasound Techniques Transabdominal (Cont.)

- Advantages:
 - ~ Images available in transaxial, sagittal, and oblique planes of view
 - ~ Noninvasive
 - ~ Better 3rd trimester visualization



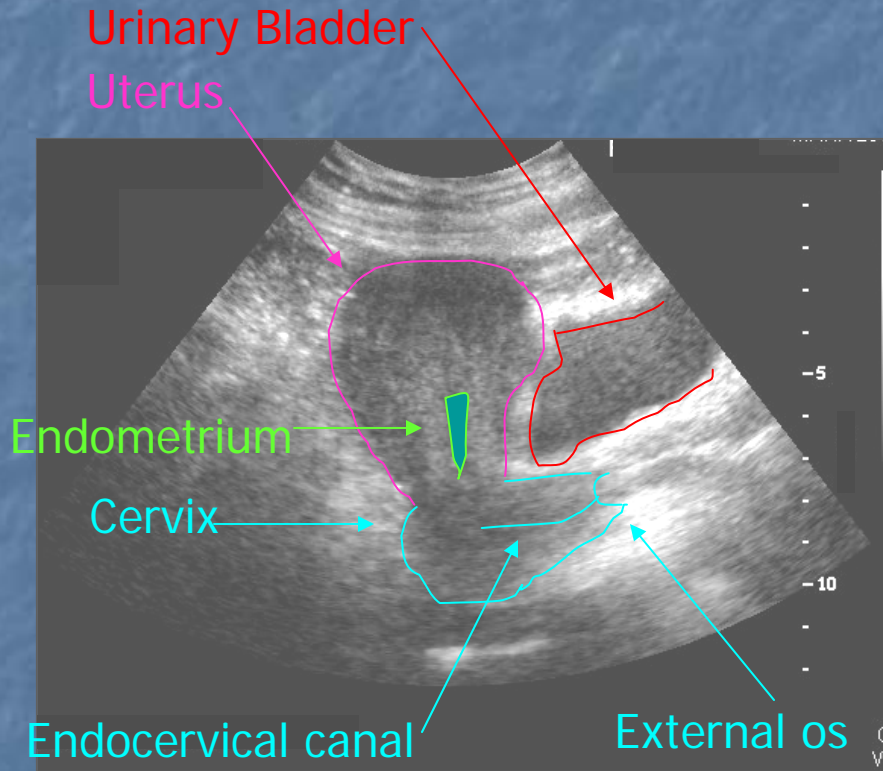
Patient L.S.

2/25/02

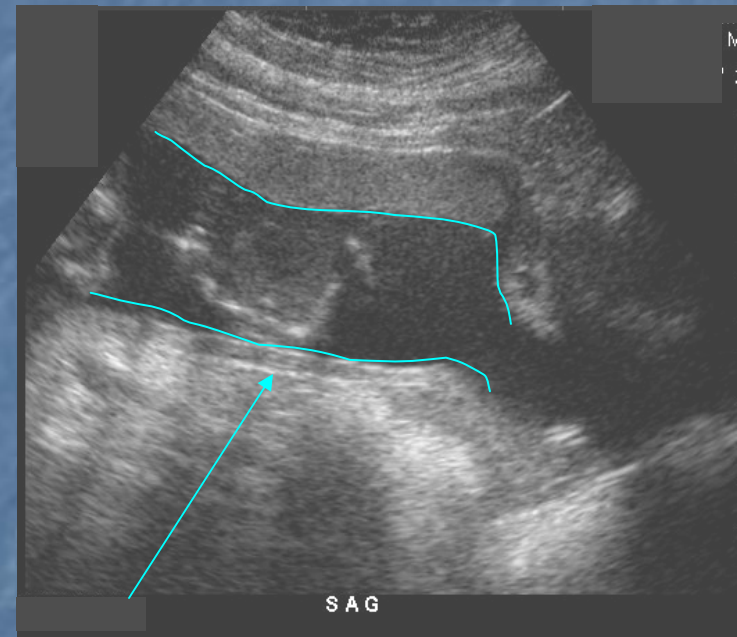
- 40 year old woman with a twin pregnancy comes to BIDMC for a well being check.
- HPI- gestational age 33 weeks.
- PMH- positive for DES exposure.



Patient L.S.- Transabdominal Ultrasound



Normal



Cervix

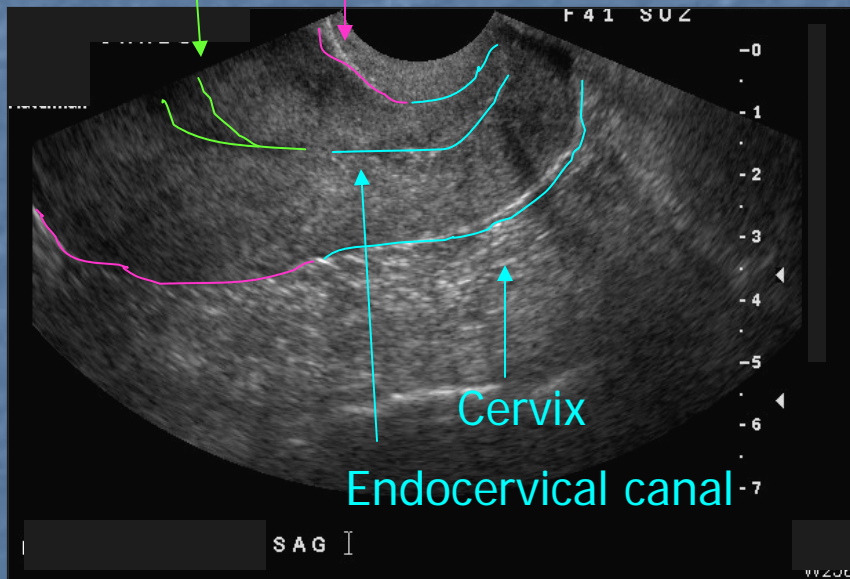
L.S.



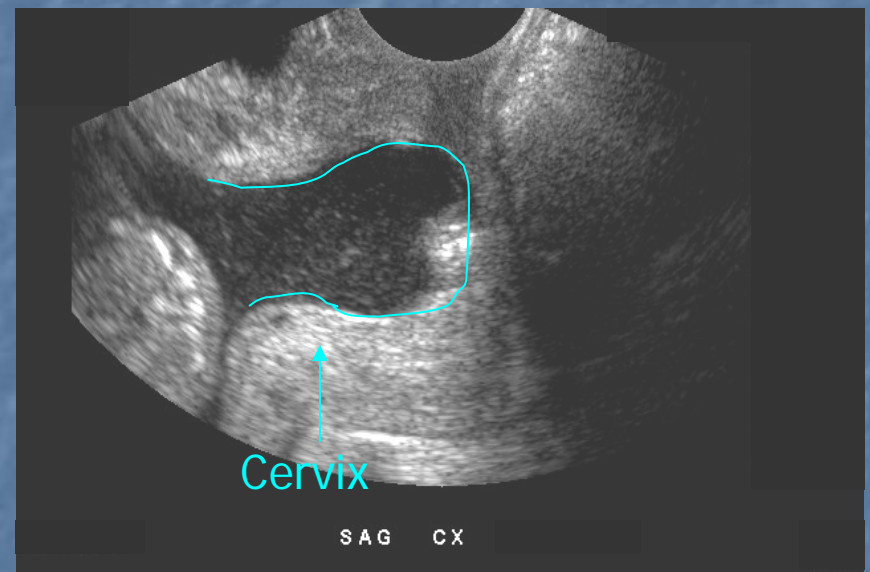
Patient L.S.- Transvaginal Ultrasound

Endometrium

Uterus



Normal



L.S.



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 2nd trimester
- **Incidence**- 0.2-2 of every 1000 pregnancies
- **Etiology**- Congenital (DES exposure) or Acquired (trauma)
- **1st presentation**- pelvic pain, low backache, vaginal discharge (w/ or w/o blood)



Cervical Incompetence (Cont.)

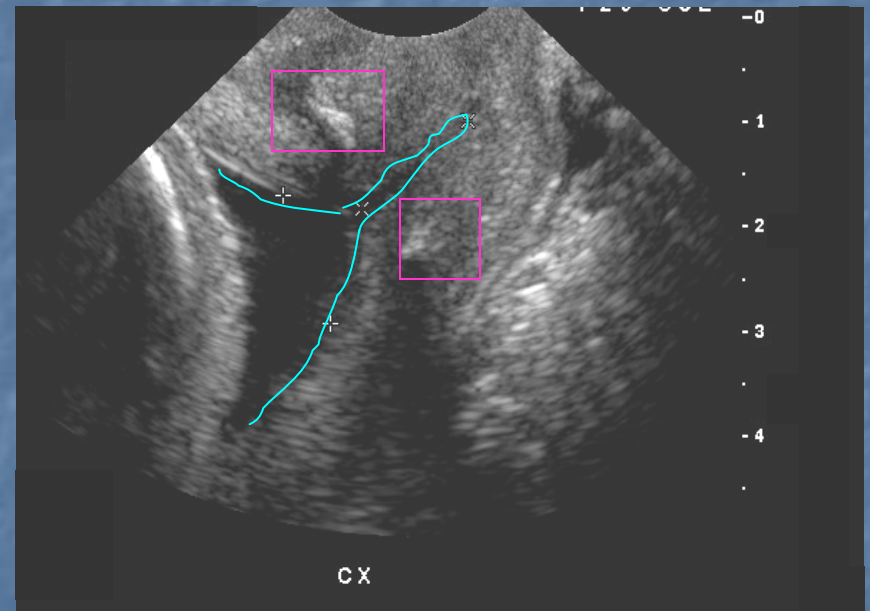
- **US findings**- shortened cervix, funneled internal os from inside out, endocervical ballooning
- **Diagnosis**- established by an obstetric history of cervical dilation in the 2nd trimester
- **Complications**- membrane rupture, delivery of immature fetus, pregnancy loss
- **Treatment**- cerclage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



Cervical Incompetence- Treated by Cerclage

Cerclage sutures

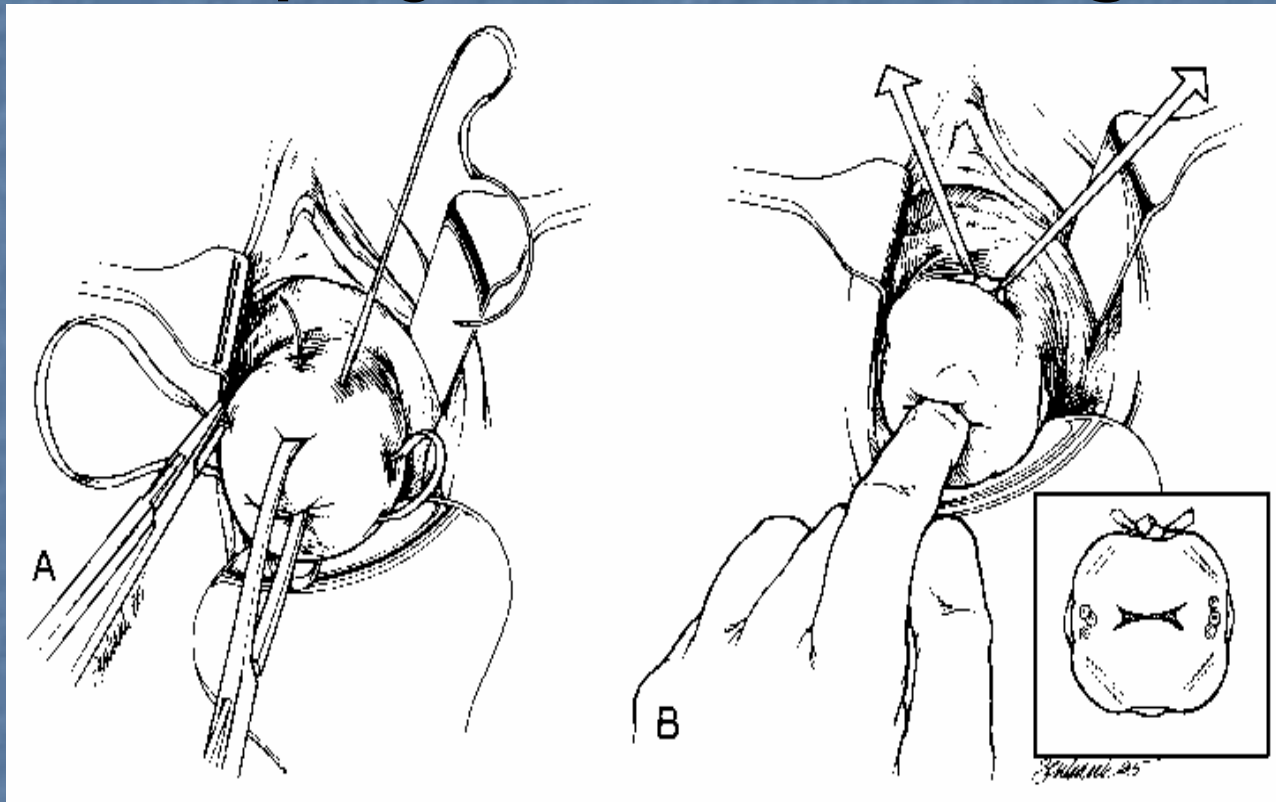
Funneling endocervical canal



Source: BIDMC PACS



Prophylactic Cerclage



Source: [Obstetrics-
Normal and Problem
Pregnancies](#)

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.



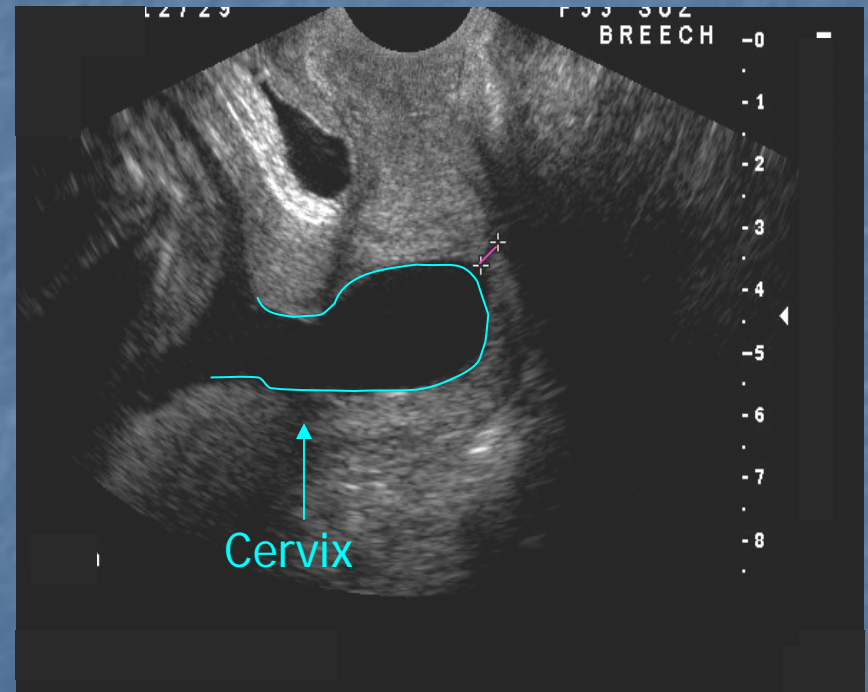
Patient K.P. 6/10/02

- 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



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Dedication

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