Placenta, Cord and Amniotic Fluid

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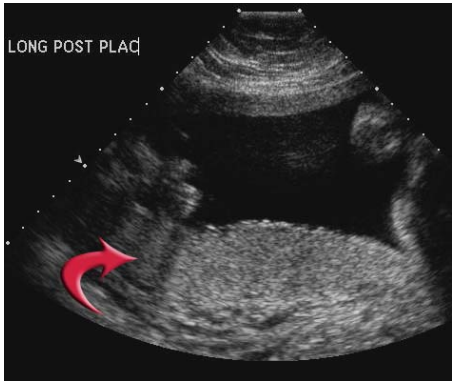
- Maternal Surface:
  - Basilar plate
  - Irregular (lobulated)
  - Divided into cotyledons
    - each cotyledon divided into lobules
- Fetal Surface:
  - Chorionic plate
  - Smooth
  - Covered by amniotic membrane
  - Area of Cord insertion
    - where amniotic membrane joins cord insertion
    - point of branching of 1 umb. vein and 2 umb. Art.

Placenta

Placental Functions:

- Maintenance of pregnancy:
  - Endocrine
    - HCG, Estrogen, Progesterone production
- Fetal support:
  - Maintains of homeostasis
  - Metabolism & nutrient transfer
    - Glycogen, cholesterol and fatty acid synthesis
    - Electrolytes, glucose, vits. Water transport
  - Gas and waste exchange
    - oxygen, carbon monoxide, carbon dioxide exchange
    - Urea, uric acid & bilirubin disposal



- 16-20 cm x 5cm, 450-550 gms
- Early pregnancy-
  - 50-70% of uterine volume
- Later pregnancy-
  - uterus grows faster than placenta
  - 25-30%
- Maximum dimension during pregnancy-
  - 5cm in thickness
  - up to 20 weeks is <2cm

Size and proportion of placenta

Placenta Number

- Singleton-
  - One placenta
- Twins-
  - Monozygotic:
    - Monochorionic/monoamniotic
      - One placenta
    - Monochorionic/diamniotic
      - One placenta
    - Dichorionic/Diamniotic
      - Two placentas; may be fused
  - Dizygotic
    - Dichorionic/diamniotic

Placental Membranes

- Three layers
  - Chorionic plate
    - Closest to the fetus
  - Intervillous space
    - Where nutrient exchange occurs
  - Decidua basalis
    - Layer against uterus

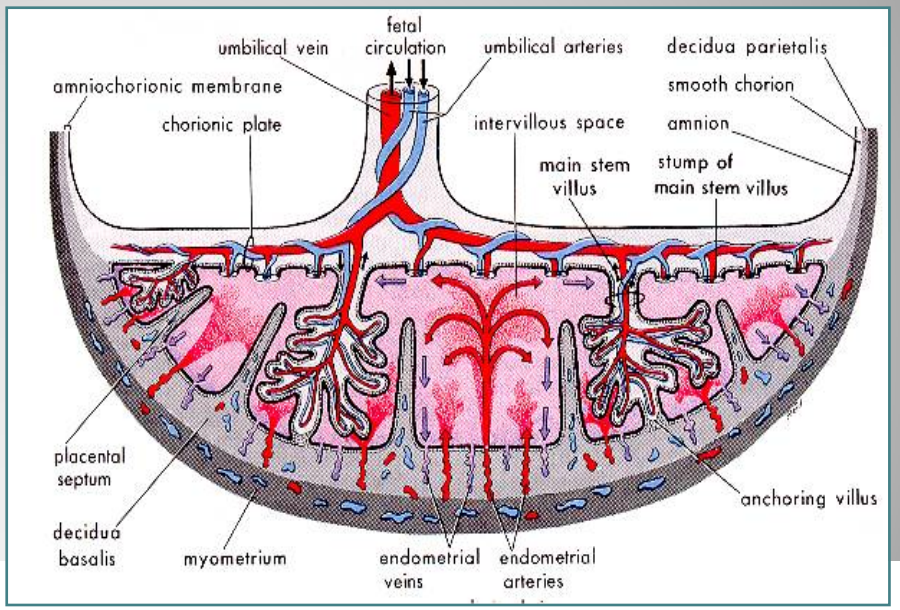
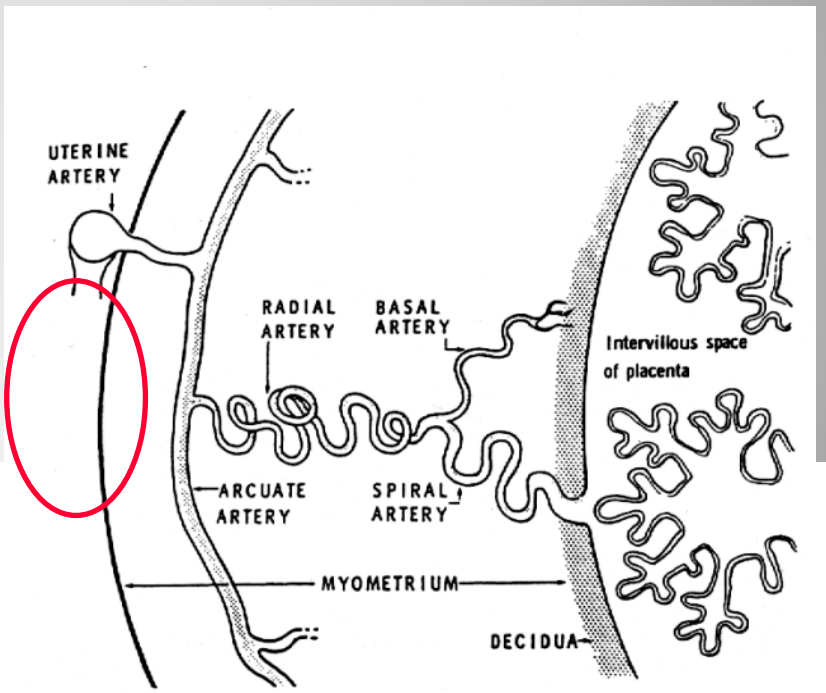
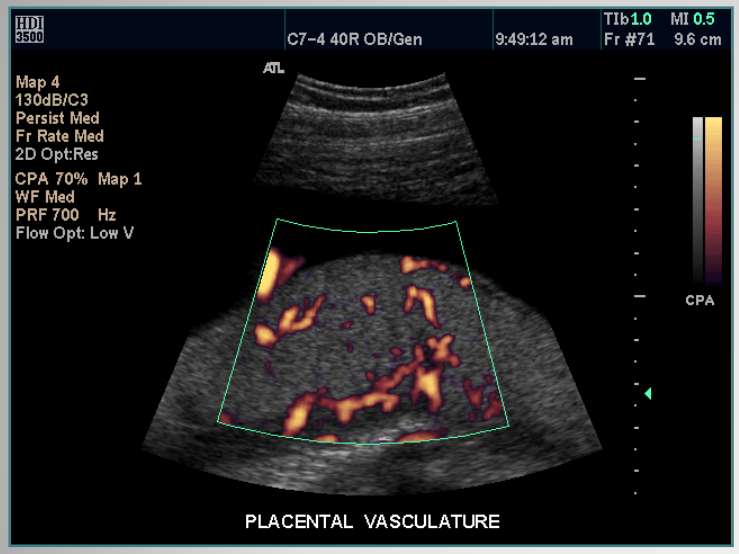


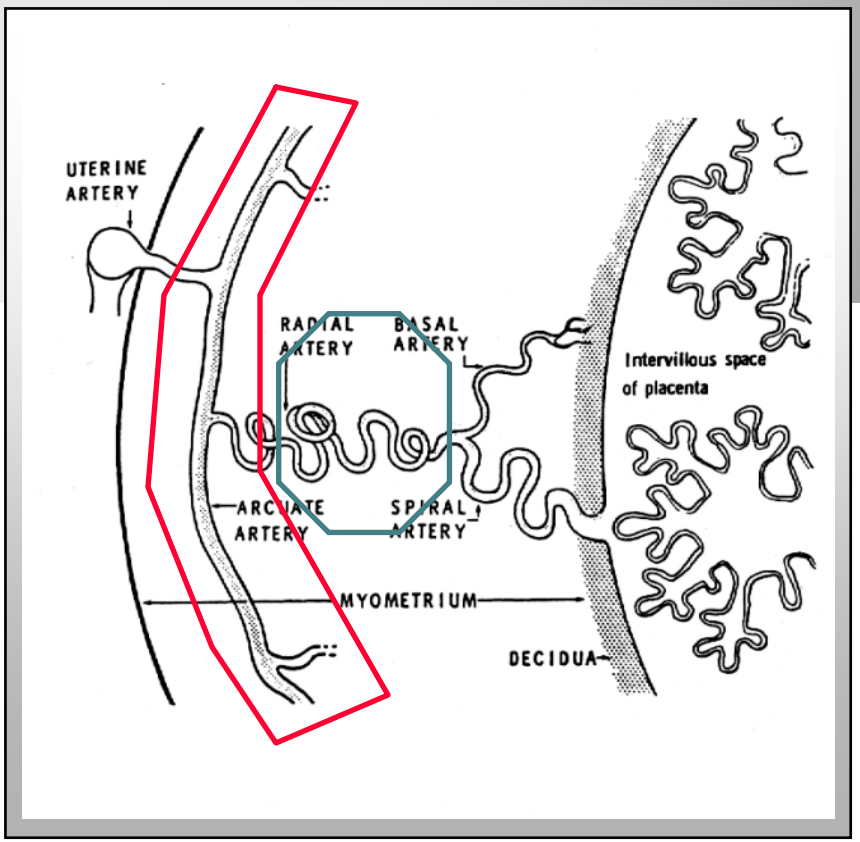
Diagram from: The Developing Human

Anatomy

- Blood supply provided by the ovarian and uterine arteries
- Uterine Arteries: main branches of the internal iliac arteries
- Uterine Arteries: Ascend through the lateral wall and anastomose with the ovarian arteries

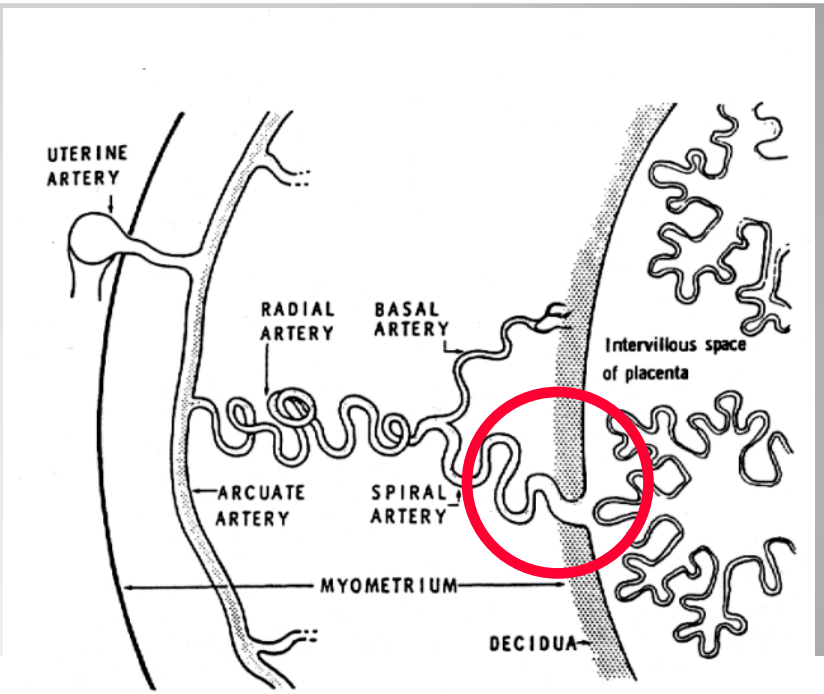


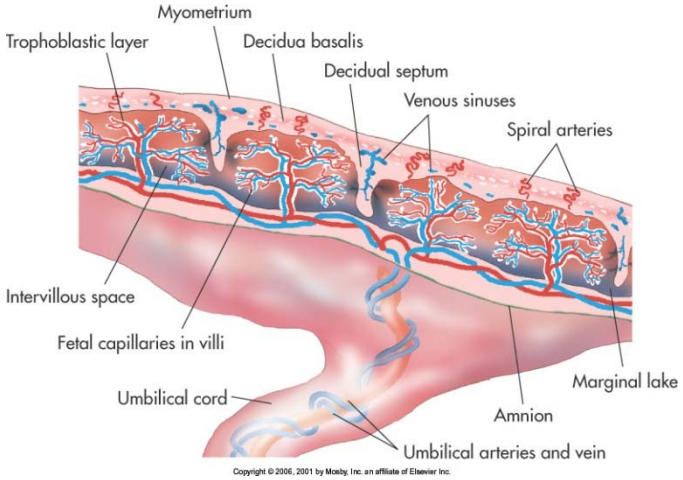




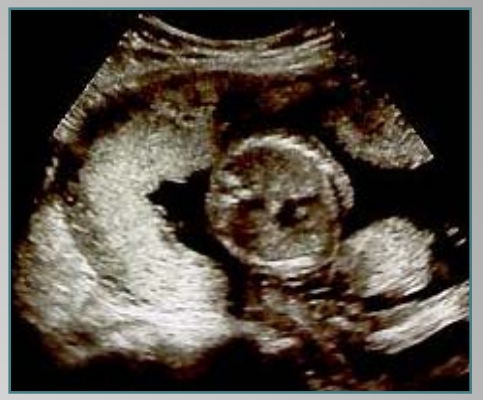
- Arcuate Arteries: Run Circumferentially around the uterus
- Uterus: Blood supply to anterior and posterior walls provided by the Arcuate arteries
- Radial Arteries: Extend from the arcuate arteries and enter the endometrium

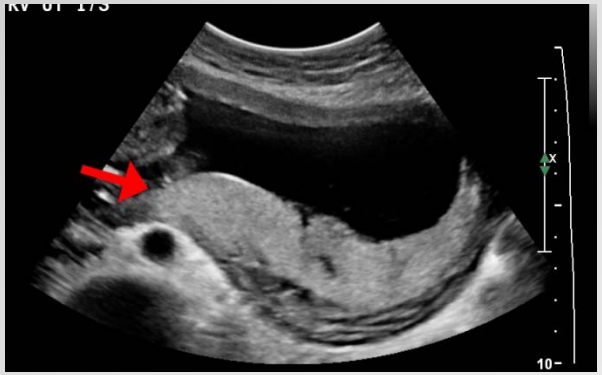
- Spiral Arteries: 100 connect the maternal circulation to the endometrium
- Responsible for a 10 fold increase in blood flow

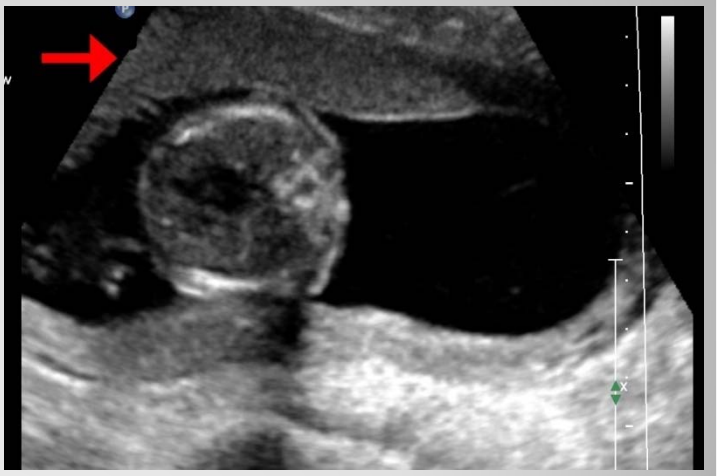




- Can be located anywhere on the uterus
  - Anterior
  - Posterior
  - Fundal
  - Right or left lateral
  - Lower uterine segment
- Combinations

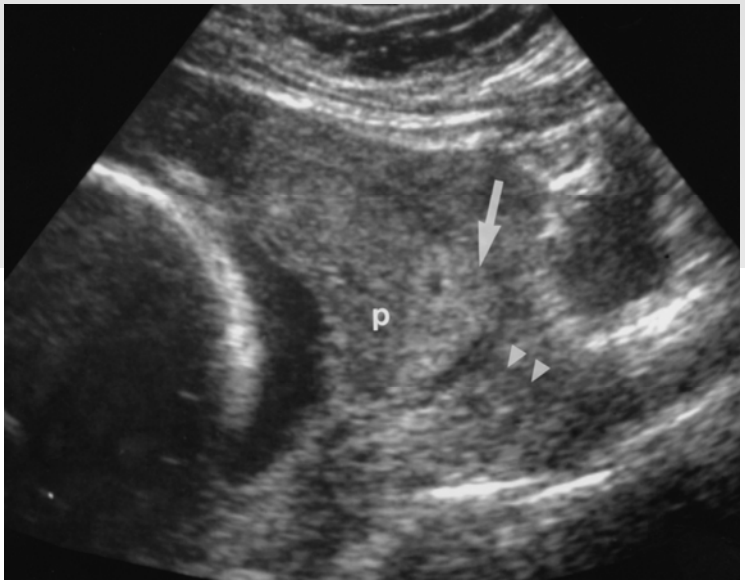






Placental Location

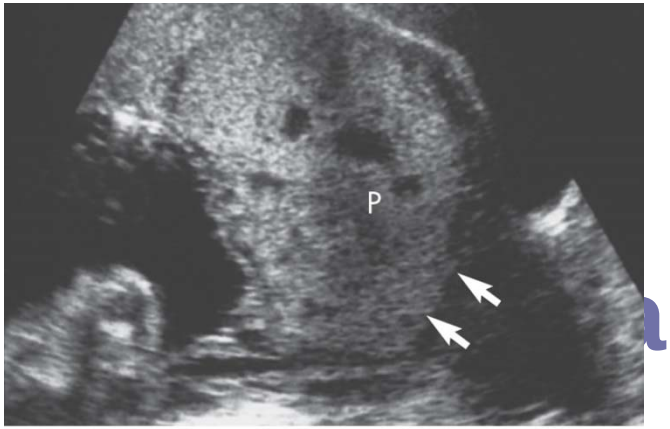
- Placenta Previa:
  - Occurs 1/200 pts. at delivery
  - Due to implantation of placenta
  - Will over call in 2nd Trimester >1/200



Conditions of the placenta: Previa

- Low lying-
  - low implantation
  - lower segment within 2cm of cervical os
- Partial or Marginal-
  - internal cervical os is partially covered but not attached on all sides
- Total-
  - complete previa entire cervical os covered

Types of Pla a:



Placenta Previa

- Based on the relationship to the cervix
- Central or symmetric complete previa has the placenta centered over the internal os

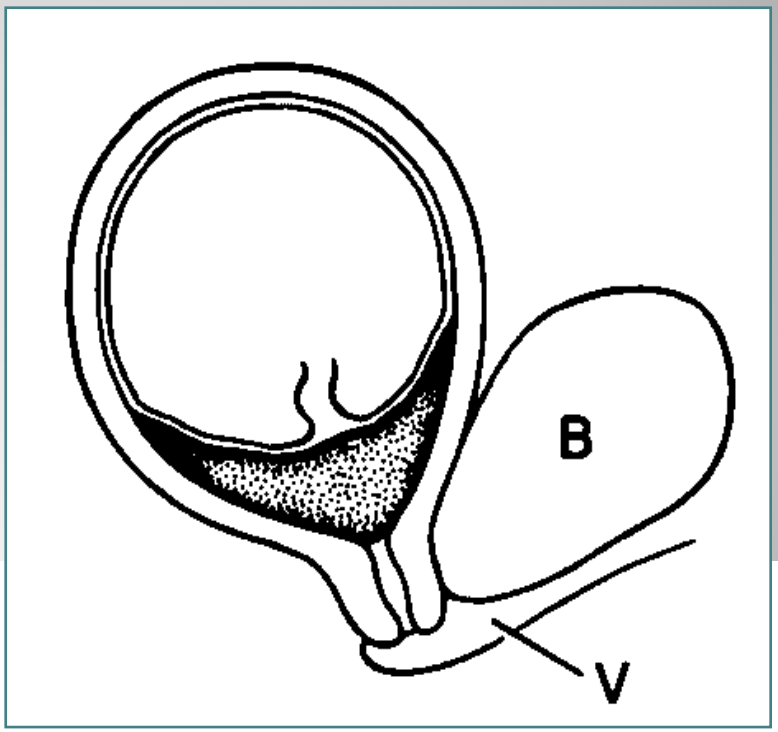


Diagram from: Ultrasonography in Obstetrics and Gynecology

Placenta Previa

- Asymmetric complete previa has most of the placenta implanted on one side of the cervical os
- Marginal previa ends at the margin of the cervix without coverage

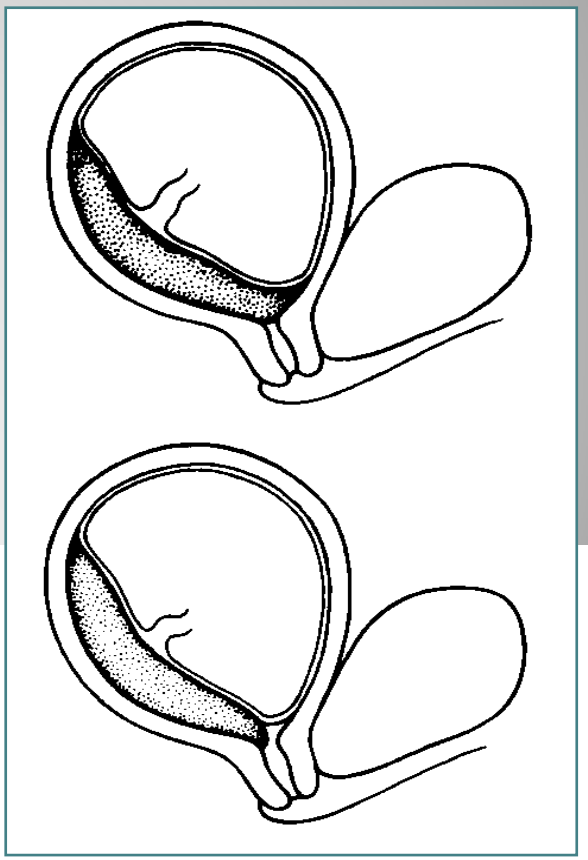


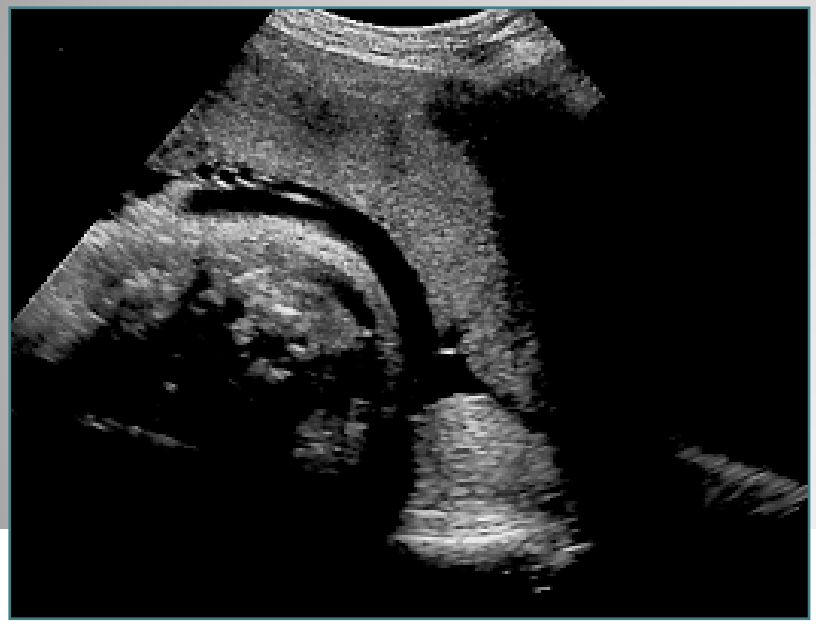
Diagram from: Ultrasonography in Obstetrics and Gynecology

- Maternal bladder must be properly filled (transabdominal exam)
- Obtain partial or full void images
- Contractions may look like placenta
- Before 20 weeks the placenta may appear low but moves as uterus grows
- Vaginal
- Labial

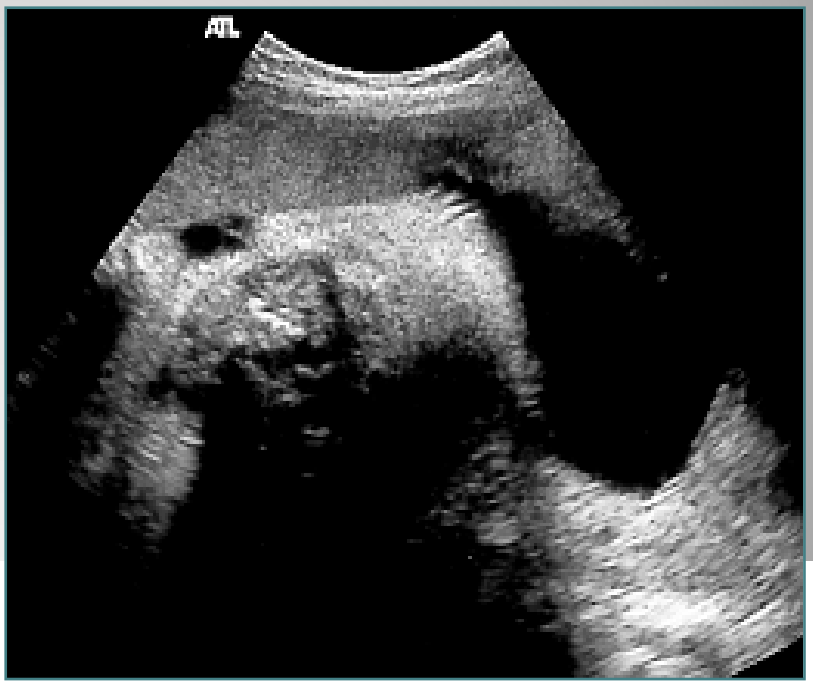
Scanning Tips for Placenta Previa

- Bladder over-distention
  - over filling can alter the shape of lower uterine segment
  - If cervix is bigger than 5cm have patient partial void
  - Always take partial/complete void pictures

False positive diagnosis



Bladder filled - previa



Post void – placenta clear of cervix

Placenta Location and Bladder Fullness

- Myometrial contractions:
  - If myometrium >1.5cm=contraction
  - Check to see placenta site
  - If transient contraction will resolve with time
  - When seen in 2nd and 3rd trimesters not always perceived by patient

False positive diagnosis

- Placenta Migration:
  - Position of placenta may change later in pregnancy >20 weeks due to differential growth of lower uterine segment
  - Placenta doesn't actually migrate
  - Rescan at @ 36 weeks to check position
  - >32-34 weeks consistent size & position
  - Late second trimester complete previa will be previa at term in most cases

False positive diagnosis

- Fibroids
- Placenta abruption with hemorrhage in cervical os
  - can look like marginal previa
- False Negative diagnosis of placenta previa
  - fetal head obscures visualization of cervix
  - lateral previa
  - hemorrhage mimics amniotic fluid over cx os

False positive diagnosis

- Signs of placenta previa:
  - painless 2nd and 3rd trimester vaginal bleeding
- Methods of evaluation of previa:
  - transabdominal U/S
  - transvaginal U/S
    - can cause bleeding in 3rd trimester!
  - Translabial U/S
    - highlights cervical area very well

False positive diagnosis