1 **First Trimester Pathologies**

Michelle Wilson Ed.D, RDMS, RDCS

2 ***Subchorionic Hemorrhage***

- Most common occurrence of bleeding in the first trimester
  - Implantation bleeds
- Found between uterine wall and fetal membranes
- Clinical findings:
  - Bleeding, spotting, cramping
- Sonographic findings:
  - Early-echogenic
  - More time- anechoic
  - No flow noted in the area
-

3 ***Placental Hematomas and Subchorionic Hemorrhage***

- Most hemorrhages contiguous with placental edge

- Difficult to distinguish from subchorionic hemorrhages

4 **Spontaneous AB**

- Mostly 5th-12th week
- Vaginal bleed
  - possibly no knowledge of pregnancy
- May require a D (dilatation) & C (curettage)

5 **Abortion (AB)**
**Interruption is progress of pregnancy**

- Causes of AB:
  - Induced
  - Spontaneous
    - Fetal malformation
    - Hormone inadequacies
    - Defective implantation
    - Placental maldevelopment
    - Systemic infection or toxic agents
    - Rh incompatibility
    - Maternal trauma

6 **Threatened Abortion**

1 - Threatened:
  - Vaginal bleeding
  - Possible visible fetus
  - No dilation of cervix

  - 50% go on to abort
- 2 Sonographic findings:
  - Check sac placement
  - Check sac appearance
    - Double decidual sign
  - Uterine size?
  - Eval. adnexa

7 **Inevitable AB:**

- Abortion in progress-
  - Vaginal bleeding, Cervical dilation, Uterine contractions
- Sonographic Findings:
  - Cervix is widened and fluid filled
  - Low lying gestational sac
  - May be fluid around sac at detachment

8 **Incomplete AB**

- Fetus is expelled, but products of conception are retained
  - Pain and bleeding
  - D & C required
- Several sonographic findings:
  - Intact gestational sac with nonliving embryo
  - Collapsed gestational sac with gross misshape
  - Retained products may be subtle
    - Thickened endometrium greater 5mm
    - Obvious embryonic parts

9 **Complete AB**

- Empty uterus
- No adnexal mass or free fluid
- Positive hCG levels
- Sonographic Findings:
  - Large uterus possibly
  - No gestational sac visible

10 **Missed AB**

- Demise
- Fetus and placenta retained before 20 weeks
- Retained up to 4-8 weeks
- Placenta remains attached
- Uterus small for dates
- Amniotic fluid might be reabsorbed
- No fetal heart motion
  - Must watch for min. 3 minutes with 2 observers
  - Obtain a cine-clip of thorax

11 **Missed AB**

- Sonographic Findings:
  - fetus doesn't occupy whole uterus
  - fetus may be maturated, shapeless, ill defined echoes
  - poor imaging-no amniotic fluid for delineation
  - fetal skull plates may overlap "spalding sign"

12 **Septic AB**

- Infected dead fetus
- May show gas formation

13 **Blighted Ovum**

- Anembryonic Gestation-
  - Gestational sac but no embryo +HCG test
    - trophoblast in tact
  - Different growth rate of sac:
    - Small fetal sac and large uterus or "vise versa"
-
- Sonographic appearance:
  - Large empty gestational sac
  - No yolk sac amnion, or embryo
  - Typically larger gestational sac size than expected
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14 **Corpus Luteum Cyst**

- Site where egg was released that went on to conception
- 3-4cm at 12 weeks begins to regress
  - Placenta takes over at this time
- Secretes progesterone
- If continued growth can cause pain

15 **First Trimester Pelvic Masses**

- *Typically <5cm*
- *Ring of increased vascularity*
- *Regress after first trimester*
- *Document size, shape, internal echoes, and vascularity*
    - *Document no torsion*
    - *Establish baseline for follow up*
-

16 ***Uterine Masses***

- Leiomyomas common
  - Establish size, location
    - Estrogen dependent-may increase in size
    - May compress gestational sac
  - Sonographic characteristics
    - Hypoechoic, echogenic, isoechoic in relation to myometrium
    - Poor acoustic transmission
    - Less vascular than uterine contraction

- Evaluate and document over time
  - Contractions regress

17 **Abnormal Pregnancy: Sonographic Findings**

- Identify:
  - Intrauterine
  - Cardiac activity
  - Gestational sac or embryonic size
  - Yolk sac
  - Adnexal evaluation

18 **Shapeless Embryo**

- No distinctive head or body
- Sign of various trisomies

19 **Yolk Sac Abnormal**

- Round
- Sonolucent
- Measuring between 2-5mm

20 **Nuchal Edema**

- Nuchal Lucency
  - Small black space under skin behind neck
  - Between 10-14 weeks
    - <3mm is normal
  - Between 15-22-nuchal fold
- Normal karyotype
  - 4% will have non-chromosomal disorders
- Finally nuchal lucency
  - Spontaneously regress.
  - Not often seen after 20 weeks.
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21 ***Cystic Hygroma***

- Cystic lesion on the posterior aspect of the fetal neck and upper thorax
- Look for nuchal thickening
- Associated with Trisomies 21, 18, 13

22 ***Normal Cranial Anatomy***

- Choroid plexus well seen in embryonic cranium
- Rhombencephalon, normal cystic structure
- Cerebral falx noted midline
  - After 9 weeks

23 **Diagnosis of Embryonic Abnormalities in the First Trimester-*Cranial Anomalies***

- *Acrania*
- *Anencephaly*

- *Cephalocele*
- *Ventriculomegaly*
- *Holoprosencephaly*
- *Dandy-Walker Malformation*
- *Spina Bifida*
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24 **Skeletal Defects**

- 1 per 4,000 births
- Most common
  - Thanatophoric dysplasia
  - Osteogenesis imperfecta
  - Achondroplasia
  - Achondrogenesis
  - Caudal Regression syndrome

25 ***Cardiac Defects***

- 4 Chamber views

- Embryonic Bradycardia
  - Normal rate 90-170 bpm
    - <90 bpm, poor prognostic sign

26 ***Abdominal Wall Defects***

- Normal bowel herniation concludes by 12 weeks
  - Echogenic mass at the base of umb. cord
  - Liver never herniates
- 
- Bowel only omphaloceles associated with chromosomal abnml
- Gastroschisis

27 ***Obstructive Uropathy***

- Very large urinary bladder
  - Cystic mass
  - Bladder outlet obstruction
- Hydronephrosis
  - Varying degrees of pelvicalyceal dilatation

28

**2 Vessel Cord**

- 1% of pregnancies
  - 1 to 10% have aneuploidy
- Try to identify number of vessels in cord if other findings are identified

29 **Assessment to determine if embryo is normal vs. abnormal**

- Distorted sac shape
  - Irregular contour
  - Intra or Extra Uterine
- Decidual reaction:
  - Thin wall of echoes <2mm or thick
- Sac size:
  - >25mm no embryo
  - > 20mm no yolk sac
- Embryonic anomalies
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