Placental Disorders
Tips for Diagnosis

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Imaging Guidelines
Document placental location
Relationship to internal cervical os
Placental appearance
Placental cord insertion assessment

Placental Size

- Placental thickness ↑ with gestation
- > 4 cm is considered abnormally thick

Placental Size – Imaging Pitfalls

- Subplacental veins
- Acute placental hemorrhage
- Myometrial contraction
- Fibroids
Placental Thickening

- Maternal
- Fetal
- Placental

Placental Thickening: Maternal
- Anemia
- Diabetes
- Intrauterine infections

Placental Thickening: Fetal
- Hydrops
- Macrosomia
- Diabetes
- Infections
- Neoplasms
- Beckwith-Wiedemann Syndrome
- Umbilical vein obstruction
- High output cardiac failure
  - AVM, Chorioangioma, sacrococcygeal teratoma, cardiac anomaly etc.

Placental Thickening: Placental
- H. mole
- Hemorrhage
- Chromosomal abnormalities (usually triploidy)

Placental Size – Too Small
- Intrauterine growth impairment
- Preeclampsia
- Placental infarction
- Polyhydramnios
**Diagnostic Challenge**

Echogenic rim of placental tissue at edge of placenta

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**Circumvallate Placenta**

- A double layer of amnion & chorion, as well as necrotic villi & fibrin, form a raised white ring around the surface of the placenta disk at a variable distance from the umbilical cord insertion site

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**Interpretation Tips**

"Look carefully at attachment points"

- Circumvallate placenta
  - Membranes attach only on placenta

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- Amniotic band
  - Membranes attach to fetus

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**Amniotic Band**

- 2º to amniotic membrane rupture
- This causes amniotic fibrous bands to float in the amniotic fluid and potentially wrap around parts of the baby or umbilical cord

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**Amniotic Band**

- Spectrum of asymmetric disruption deformities & amputations
  - Absent digits, limbs, or portions of limbs
  - Facial clefts
  - Cranial & abdominal wall disruption

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**Amniotic Band**

- Distal edema
  - Left Leg
- 20 weeks GA
Amniotic Band

Arterial Flow Decreased

Amniotic Band

Intrauterine YAG-Laser band release

Lucia was born at 28 weeks gestation

Amniotic Band

BAND RESECTION AND MULTIPLE Z-PLASTY
**Succenturiate Lobe of the Placenta**

- One or more extra lobes of the placenta separated from the body of the placenta

**Identify Communicating Vessels**

- Imaging or ultrasound technique to visualize the connections between the placenta and the umbilical cord.
**Identify Cord Insertion Site**

- Succenturiate lobe + vasa previa
  - 60-80% fetal mortality if not diagnosed prenatally

**Succenturiate Lobe of the Placenta**

Differential diagnosis:
- Subchorionic hemorrhage
- Myometrial contraction
- Uterine myoma

**Caution!**

**Diagnostic Challenge**
Velamentous Cord Insertion

The velamentous vessels are surrounded only by fetal membranes, with no Wharton's jelly, thus they are prone to compression or disruption.

- Suspect when marginal placental insertion
- Diagnosis made with Doppler color flow

Remember
- Find both CI sites in monochorionic twins

"Twins have 6 to 9 times higher incidence"
**Velamentous Cord Insertion**

- Velamentous insertion of the umbilical cord in one of the twins is a significant risk factor for TTTS

**Vasa Previa**

- Partial or complete obstruction of the internal cervical os by blood vessels

**Diagnostic Challenge**
**Vasa Previa**

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

**Risk Factors**

- Prior cesarean deliveries
- Multiple gestation
- Increasing parity
- Maternal age
  - higher in older nulliparous females
- Number of curettages for spontaneous or induced abortions
- Smoking
- Cocaine use

**False Positive Vasa Previa**

- Obligate cord presentation
- Marginal vein
- Cervical varices

**Placenta Previa – Risk Factors**

- Previous placenta previa
- Prior cesarean deliveries
- Multiple gestation
- Increasing parity
  - incidence 0.2% in nulliparas versus up to 5% in grand multiparas
- Maternal age
  - higher in older nulliparous females
- Number of curettages for spontaneous or induced abortions
- Smoking
- Cocaine use

**Risk of Previa**

- 0.26% If no prior C-section
- 0.65% If 1 prior C-section
- 1.8% If 2 prior C-section
- 3.0% If 3 prior C-section
- 10.0% If 4 or more prior C-section

*Clark 1985*

**Placenta Previa – Marginal**

- Inferior edge of placenta within 2cm of 3D
- Often resolves with advancing pregnancy
**Placenta Previa – Partial**

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

**Placenta Previa – 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

**Placenta Previa – Complete**

- Symmetric complete previa
- Placenta centrally implanted on cervix
- Will not resolve with advancing pregnancy

**Remember**

Use TVUS to R/O placenta previa in all patients with bleeding in 2nd & 3rd trimester
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)

**Consequence of Placenta Migration**
- Regressing previa
- Succenturiate lobe
- Vasa previa
- Migration cord origin
- Velementous cord origin

**Succenturiate lobe**
- May be low-lying or cross internal os
**Trophotropism**

**Placenta Previa: False Positives**
- Overfilling of the bladder
- Uterine contraction
- Fibroid low in the uterus

**Reminder**
- The placenta’s relationship to the IO should be assessed in every scan. *Failure to see the inferior edge of the placenta should lead to TV scanning to R/O previa if not previously done in the 2nd trimester.*
- A previa can be missed near term if the fetal head is low in the pelvis

**↑ AFP = ???**
- G4 P3
- Prior C-section
- There is high association with placenta accreta and elevated AFP

**Placenta Accreta**
- In patients with placenta previa, the risk of accreta is 10-25% with 1 previous CS and 50% with 2 or more previous CS
- 1/22,000 pregnancies in the absence of previa
Risk Factors

- Prior Uterine resection
  - septum revision, myomectomy
- In Vitro Fertilization – 13 fold increase
- Endometrial ablation
- Radiation therapy
- Smoking
- Age

Placenta Accreta

- High morbidity from maternal bleeding
- 90% require transfusions
- 7% mortality
- 15% uterine rupture with percreta
- Plan and manage clinically for worst case scenario
- Deliver at 34-35 weeks
- Complications from bleeding increase after 36 weeks
- C-Section with hysterectomy

Placenta Accreta

- Low implantation site, especially if offset (cesarean scar)
- Abnormal vascular spaces
- Irregular placental / myometrial interface

Identifying Sonographic Markers for Placenta Accreta in the First Trimester

- Low sac at 6 weeks gestation
- 4 prior cesarean sections
- Placenta percreta
Placenta Previa
without invasion of the myometrium

Myometrium thickness

Intact bladder
Uterine wall interface

Placenta Accreta - Diagnostic Criteria

• Multiple hypoechoic placental vascular lacunae
  – Swiss cheese appearance

Placenta Accreta - Diagnostic Criteria

• Loss of hypoechoic myometrial zone
• Thinning of subplacental hypoechoic zone < 1-2 mm
• Loss of bladder mucosal reflector
• Focal exophytic masses

Placenta Accreta - Diagnostic Criteria

• Usually occur low and at site of prior c-section
• Use high resolution linear transducer for anterior placenta
**Placenta Accreta - Diagnostic Criteria**

- Presence of color “tongues” of blood flow to the myometrial lakes

**Normal Placenta**
"In the 16 of 17 cases of percreta, the serosa-bladder interface hypervascularity was associated with vascularization of the entire placental width."

Placental Abruption

- Placental abruption causes a wide spectrum of sonographic findings that may be overlooked or misdiagnosed
- Look for placenta abruption in all gestations >20 wks with vaginal bleeding or tender uterus
- Poor outcome when fetal bradycardia present

Abruptio Placenta

- Subchorionic 81%
  - 91% before 20 weeks
  - 67% after 24 weeks
- Retroplacental 16%
- Preplacental 4%

Abruptio Placenta

- Acute hemorrhage occasionally difficult to distinguish from the adjacent placenta
Sonographic Features of Abruptio Placenta

Placental Abruption – False Positives

Subchorionic Hemorrhage

Subchorionic Hemorrhage

Diagnostic Challenge

Chorioangioma
Preplacental Hemorrhage

Hematoma is adjacent to, but does not compress the CI site

Chorioangioma

- Benign tumors of the placenta
- Histology: blood vessels (angiomatous) or cellular
- Associated with MSAFP elevation

Chorioangioma

- Well-defined
- Usually solitary but may be multiple
- Generally hypoechoic
  - Heterogeneous
  - Hemorrhage
  - Infarction
  - Degeneration
- Near cord insertion
- Size usually stable throughout pregnancy
**Chorioangioma**

- Fetal tachcardia and fetal distress may develop if there is great vascularity acting as an AVM

**Placental Infarction**

- Focal lesion
  - ischemic necrosis of the placenta
- Difficult to diagnosis sonographically unless calcification
- Prognosis dependent upon extent of process

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Thank You