Placental findings in IUGR

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Outline

- IUGR: definition(s)
- Causes of IUGR
  - Focus on placenta
  - Implications for future pregnancies
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Intrauterine Growth Restriction: Definitions

- <10\textsuperscript{th} percentile for gestational age
  - Consideration of sex and race/ethnicity
    - M>F
    - White>Hispanic>Black>Asian
- Vs. constitutionally-small fetus
  - Normal growth \textit{over time}
  - Normal umbilical artery doppler
  - Normal amniotic volume
Intrauterine Growth Restriction: Definitions

- In the absence of that clinical data:
  - Fetal growth restriction (FGR)
  - Small for gestational age (SGA)

- **Many studies use birthweight (single measurement in time) and therefore cannot distinguish between FGR/SGA & IUGR**
Intrauterine Growth Restriction: Definitions

- Symmetric
  - Entire body is small (including head and abdominal circumference)

- Asymmetric
  - Head-sparing (abdominal circumference is reduced compared to head)
IUGR: Pathologist’s definition

- Birthweight
  - (vs. weight at autopsy, usually lower)

- Foot length
  - >2 week discrepancy between clinical and anatomically-determined gestational age may indicate symmetric IUGR

- Brain:liver weight ratio
  - 3:1 indicates symmetric growth
  - >3:1 indicates asymmetric growth (head-sparing)
Outline

- IUGR: definition(s)
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Causes of IUGR

- Fetal causes
  - Symmetric IUGR
  - Ex. Aneuploidy

- Placental causes
  - Asymmetric IUGR (onset in latter half of pregnancy)
  - Rarely symmetric IUGR (onset earlier in pregnancy)
Placental causes of IUGR

- Maternal vascular malperfusion
- Chronic villitis of unknown etiology
- Increased perivillous fibrin deposition
- Fetal vascular malperfusion
Placental causes of IUGR

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Placental causes of IUGR: maternal vascular malperfusion

- Maternal hypertensive disorder
  - GHTN, CHTN, preeclampsia, etc.
  - Can be associated with abruption

- MVM/Placental “insufficiency”
  - Small placenta (<10th percentile)
  - Hypermaturity
  - Infarction
  - Decidual vasculopathy
  - Retroplacental hematoma (with abruption)
MVM/placental insufficiency

- Hypermaturity: numerous syncytial knots present throughout the placental disc (not just near the fetal surface) in a placenta <37 weeks gestation
MVM/placental insufficiency

Infarct
MVM/placental insufficiency

Decidual vasculopathy
MVM/placental insufficiency

Retroplacental hematoma (abruption)
MVM/placental insufficiency

- Risk of recurrence depends on underlying disease/severity
- Preeclampsia: risk is highest in first pregnancy
Placental causes of IUGR

- Maternal vascular malperfusion
- Chronic villitis of unknown etiology
- Increased perivillous fibrin deposition
- Fetal vascular malperfusion
Villitis (chronic villitis of unknown etiology/CVUE)

- Unremarkable prenatal course
- Maternal hypertensive disorder
- Maternal diabetes/obesity
- Rarely: maternal sepsis/blood-borne infection
  - Including: CMV, HSV, parvovirus, streptococcal infections
  - History is not always supportive
Villitis (chronic villitis of unknown etiology/CVUE)

- **Majority:** unknown etiology
  - Maternal response to paternal antigens?
- Can be associated with increased perivillous fibrin deposition
- **10-15% recurrence** (high grade CVUE)
Villitis (chronic villitis of unknown etiology/CVUE)

- Minority of cases: infectious villitis (TORCH)
  - CMV (inclusions)
  - Syphilis (perivascular onion skinning)
  - Toxoplasmosis (cysts in Wharton’s jelly)

**Does not recur**
Rare subtype of CVUE: Massive chronic intervillositis

**>50% recurrence rate
Placental causes of IUGR

- Maternal vascular malperfusion
- Chronic villitis of unknown etiology
- Increased perivillous fibrin deposition
- Fetal vascular malperfusion
Increased perivillous fibrin deposition

- Maternal autoimmune disease
- Maternal hypertensive disorder
- Unremarkable prenatal course (particularly in first pregnancy)
Increased perivillous fibrin deposition
aka: Massive perivillous fibrin deposition, Maternal floor infarction

**Heavy placenta**
Increased perivillous fibrin deposition

- Rule out villitis (infectious villitis, CVUE, or massive chronic intervillitis)
Increased perivillous fibrin deposition

- Can be the first manifestation of maternal autoimmune disease (i.e. lupus, APAS)
- Variable recurrence rate (depending on underlying dz)
- Recurrent IUGR can be avoided in subsequent pregnancies following treatment with aspirin/Lovenox
Placental causes of IUGR

- Maternal vascular malperfusion
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- Fetal vascular malperfusion
Fetal vascular malperfusion

- Unremarkable prenatal course
- Multifocal avascular villi (involving at least 15 adjacent villi)
  - Placenta can be normal or small
- R/o maternal coagulopathy
  - Esp. extensive FVM
  - Cause of recurrent FVM
Fetal vascular malperfusion

Can be associated with obstructive lesions of the umbilical cord

**Often non-recurrent**
Fetal vascular malperfusion: increased recurrence risk?

- **Long cord** associated with a term stillbirth
  - Deemed a “cord accident” by clinician; no autopsy was performed
  - Placental examination reveals an umbilical cord length of 117 cm (this is only noted in the gross description)
Fetal vascular malperfusion: increased recurrence risk?

- Obstetric history: prior term stillbirth with a cord length of 106 cm
- NOT a typical “cord accident”
  - “Cord accident” implies a non-recurrent lesion
- Long umbilical cord is associated with a slightly higher risk of recurrence in subsequent pregnancies
Thank you!