Perinatal Medicine 2019
09-11 MAYIS 2019, Hilton Hotel İzmir, Turkey

# Clinicopathological Correlation of Current Placental Diagnoses

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# Useful Information for Patient Care

- Identification of previously unsuspected disease
- Conditions associated with a high probability of recurrence
- Information that can guide the management of future pregnancies
- Diagnosis that provide a specific explanation for an adverse outcome

TABLE 1

## Placental classification (incorporating the 2014 Amsterdam Placental Workshop Group criteria)

1. Placental vascular processes
   a. Maternal stromal-vascular lesions
      - Developmental
        - Superficial implantation/decidual arteriopathy
        - Increased immature extravillous trophoblast
      - Malperfusion
        - Global/partial
          - Early: distal villous hypoplasia
          - Late: accelerated villous maturation
        - Segmental/complete
          - Villous infarct(s)
      - Loss of integrity
        - Abruptio placenta (arterial)
        - Marginal abruption (venous)
          - Acute
          - Chronic
   b. Fetal stromal-vascular lesions
      - Developmental
        - Villous capillary lesions
        - Delayed villous maturation (maturation defect)
        - Dysmorphic villi
      - Malperfusion
        - Global/partial
          - Obstructive lesions of umbilical cord
          - Recent intramural fibrin in large fetoplacental vessels
          - Small foci of avascular or karyorhectic villi
        - Segmental/complete
          - Chorionic plate or stem villous thrombi
          - Large foci of avascular or karyorhectic villi
      - Loss of integrity
        - Large vessel rupture (fetal hemorrhage)
        - Small vessel rupture (fetomaternal hemorrhage)
        - Villous edema
2. Placental inflammatory-immune processes
   a. Infectious inflammatory lesions
      - Acute
        - Maternal inflammatory response: chorioamnionitis, subchorionitis
        - Fetal inflammatory response: chorionic/umbilical vasculitis
      - Chronic
        - Villitis (CMV, others)
        - Intervillositis (malaria, others)
   b. Immune/idiopathic inflammatory lesions
      - Villitis of unknown etiology and related/associated lesions
        - Chronic villitis
        - Chronic chorioamnionitis
        - Lymphoplasmacytic deciduitis
        - Eosinophil T-cell fetal vasculitis
      - Chronic histiocytic intervillositis
3. Other placental processes
   - Massive perivillous fibrin(oid) deposition (maternal floor infarction)
   - Abnormal placental shape or umbilical insertion site
   - Morbidly adherent placentas (accreta)
   - Meconium-associated changes
   - Increased circulating nucleated red blood cells

*CMV*, cytomegalovirus.

*Redline. Classification of placental lesions. Am J Obstet Gynecol 2015.*

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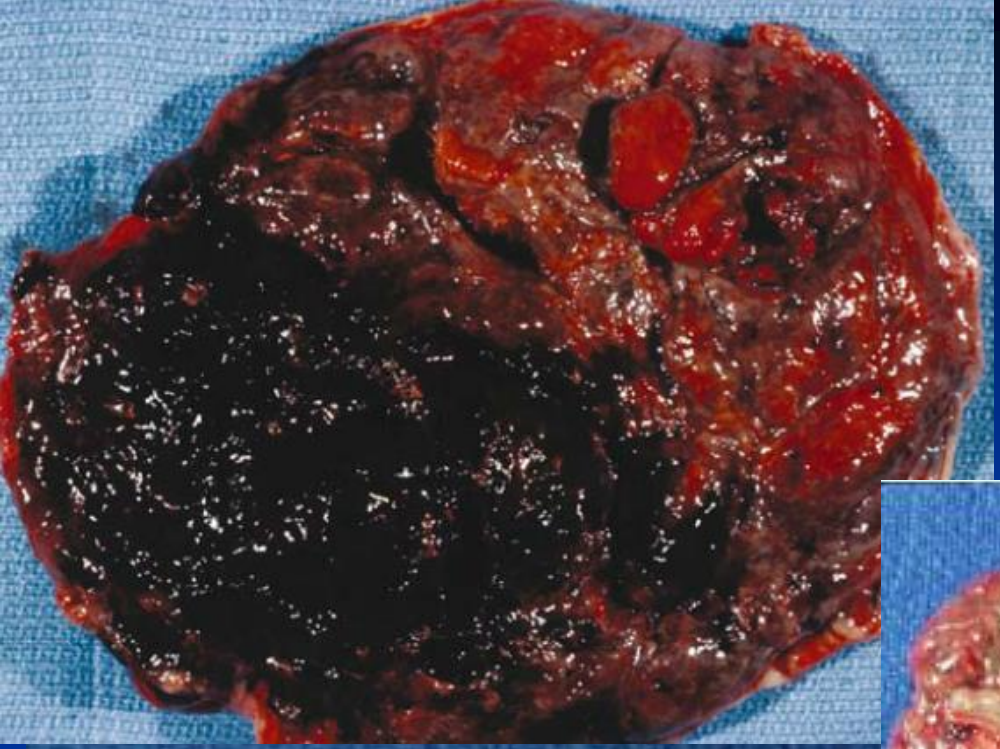

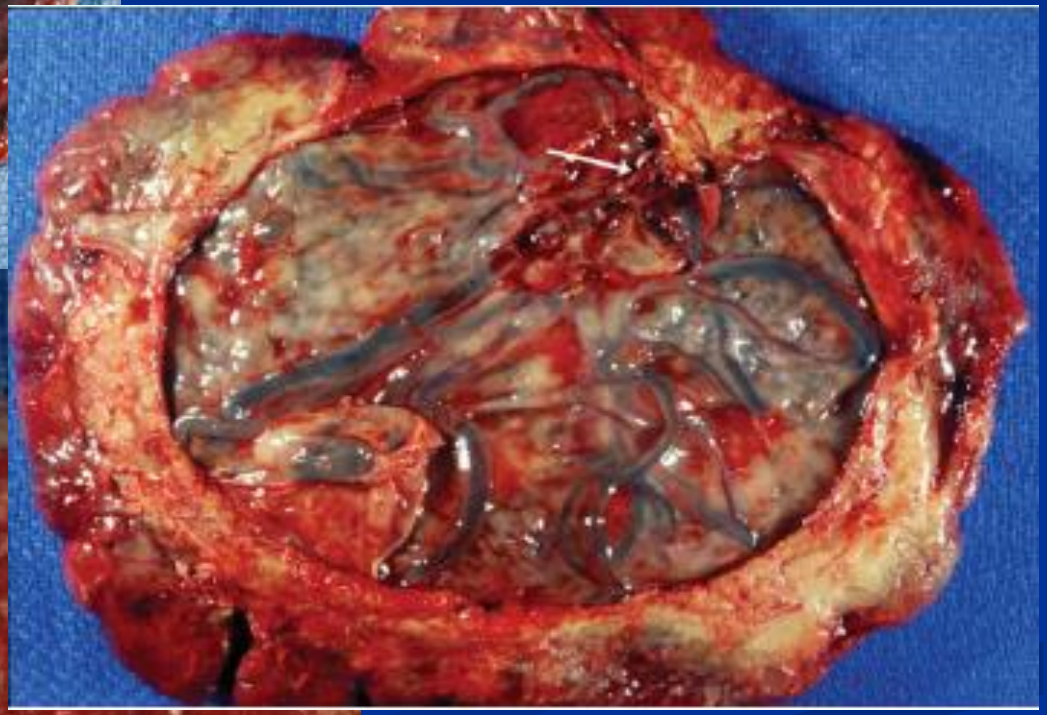

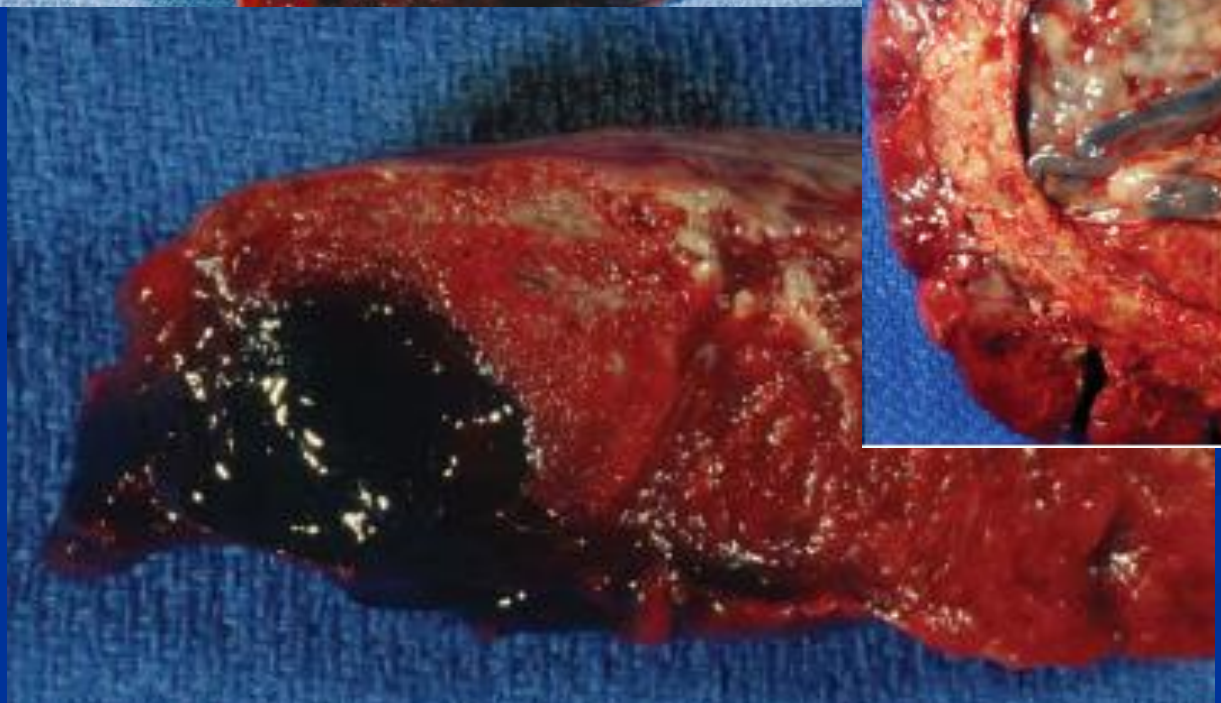

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1. Placental vascular processes
   b. Fetal stromal-vascular lesions
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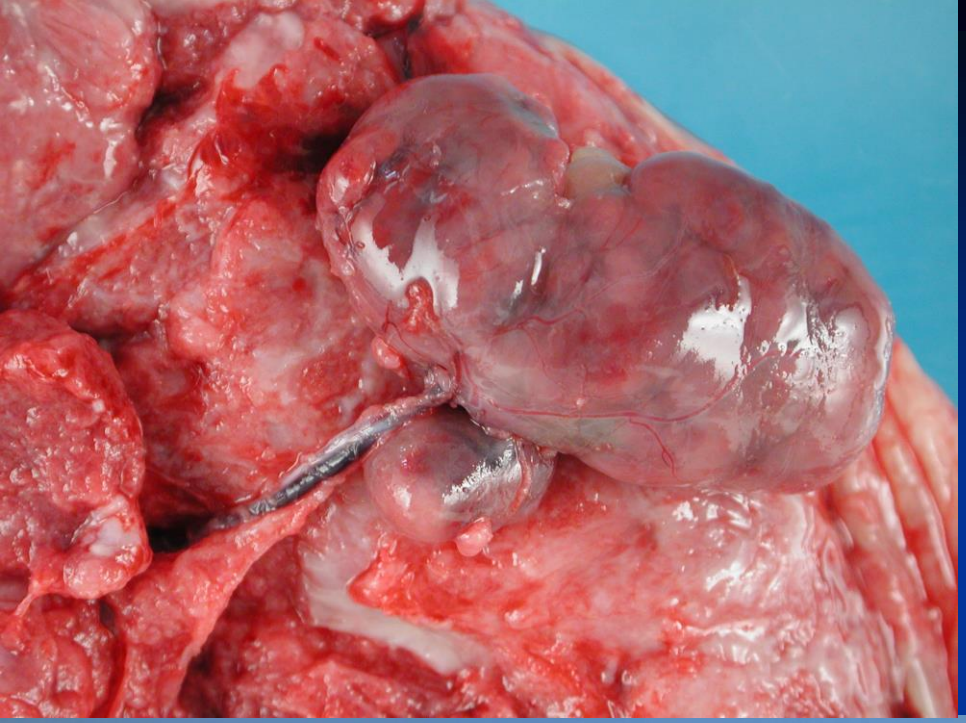

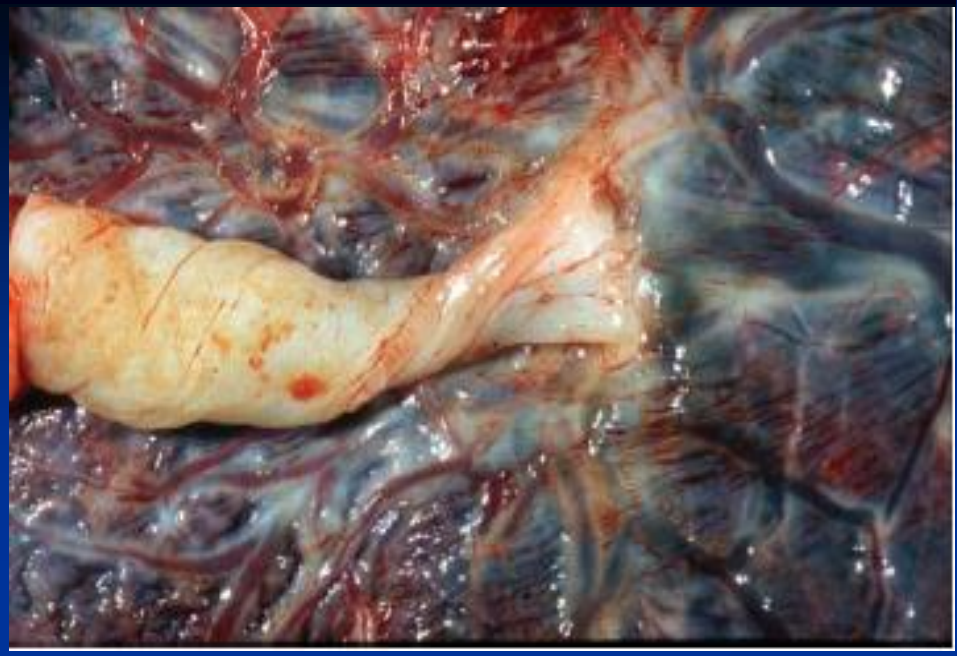

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1. Placental vascular processes
2. Placental inflammatory-immune processes
   a. Infectious inflammatory lesions
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1. Placental vascular processes
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3. Other placental processes
    - Massive perivillous fibrin(oid) deposition (maternal floor infarction)
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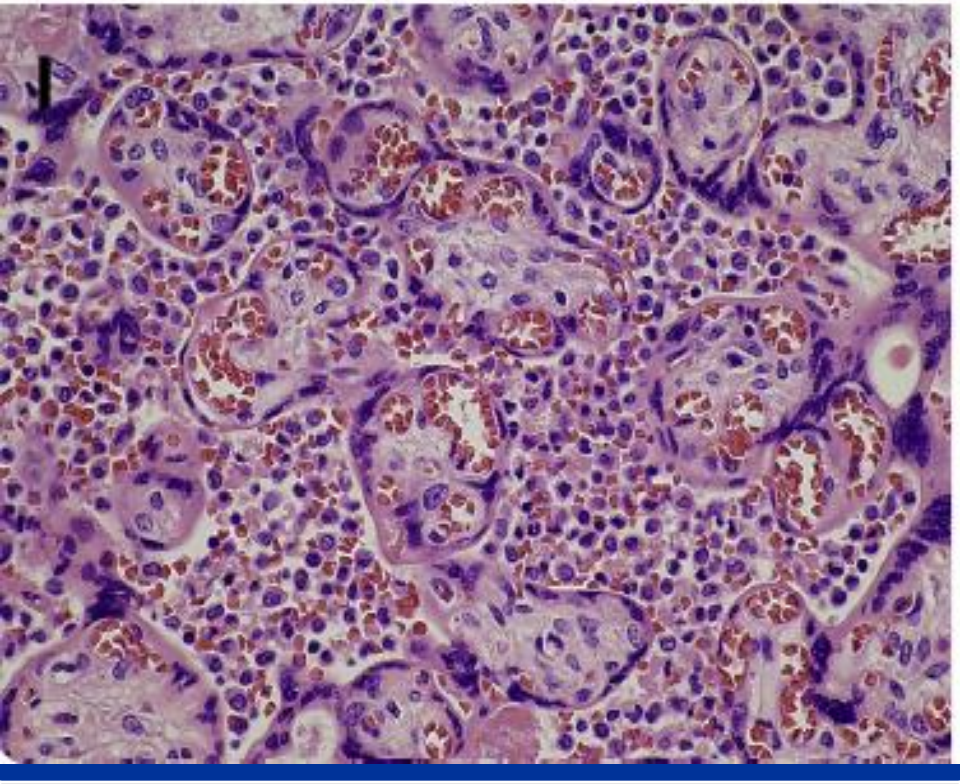
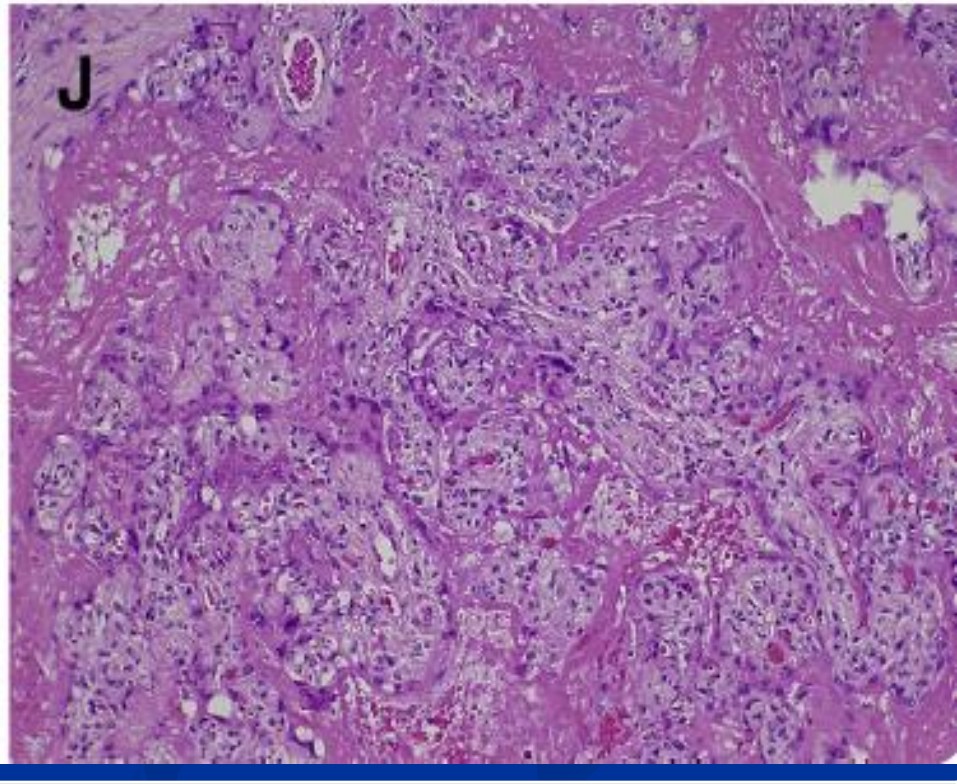
    - Increased circulating nucleated red blood cells

# Clinically significant placental lesions




| | |
|---|---|
| A.Accelerated villous maturation | B. Delayed villous maturation |
| C.Partial fetal vascular malformation | D.Partial fetal vascular malformation |
| E.Complete fetal vascular malformation | F. Villous edema |
| G. Acute chorioamnonitis | H. Chronic villitis |
| I. Chronic histiocytic intervillositis | J.Massive perivillous fibrin deposition |

TABLE 2

## Placental lesions with significant recurrence risk in subsequent pregnancies

| |
|---|
| Rare |
| Chronic histiocytic intervillositis (75–90%)[53] |
| Massive perivillous fibrin(oid) deposition (maternal floor infarction) (40–60%)[64] |
| More common |
| Villitis of unknown etiology (25–50%)[46] |
| Placenta accreta (25–30%)[65] |
| Severe global/partial maternal malperfusion (10–25%)[66] |
| Spontaneous preterm birth with histological chorioamnionitis (10–25%)[67] |

*Redline. Classification of placental lesions. Am J Obstet Gynecol 2015.*

TABLE 3

## Management implications of current placental diagnoses: selected examples

| | |
|---|---|
| Severe global/partial maternal vascular malperfusion | |
| | Evaluate maternal cardiovascular status, glucose tolerance, thrombophilia, and renal function; suggest weight loss; consider ASA therapy, uterine artery Doppler, early third-trimester placental ultrasound, early delivery in subsequent pregnancies |
| Spontaneous preterm delivery with histological chorioamnionitis | |
| | Extend neonatal antibiotics, treat underlying periodontal disease or chronic endometritis, early second-trimester cervical ultrasound, cerclage |
| Idiopathic/immune lesions (chronic villitis [VUE]), massive perivillous fibrin(oid) deposition ([maternal floor infarction] chronic histiocytic intervillositis) | |
| | Genetic counseling; maternal autoimmune testing; weight loss; consider low-molecular-weight heparin, aspirin, and/or immunosuppressive therapy; intensive early pregnancy surveillance; elective early delivery |
| Complete/segmental fetal vascular malperfusion with neonatal sequelae | |
| | Maternal/neonatal thrombophilia workup, diabetes screen, maternal platelet evaluation |
| Delayed villous maturation | |
| | Diabetes screen, suggest weight loss, perform third-trimester fetal movement counts, consider delivery prior to 40 weeks |

*ASA*, aspirin; *VUE*, villitis of unknown etiology.

*Redline. Classification of placental lesions. Am J Obstet Gynecol 2015.*

TABLE 4

## Common underlying placental causes of specific adverse outcomes

| | |
|---|---|
| Preterm fetal death | Global/partial maternal vascular malperfusion (accelerated maturation), global/partial fetal vascular malperfusion (UC accident), abruptio placenta |
| Spontaneous preterm birth | Acute chorioamnionitis, marginal abruption, mild global/partial maternal malperfusion (accelerated maturation) |
| Fetal growth restriction/indicated preterm birth | Global/partial maternal malperfusion (accelerated maturation), chronic villitis (VUE), complete/segmental fetal vascular malperfusion (fetal thrombotic vasculopathy), fetal stromal-vascular developmental lesions |
| Term fetal death | Abruptio placenta, global/partial fetal vascular malperfusion (UC accident), fetomaternal hemorrhage, delayed villous maturation |
| CNS injury at term | Complete/segmental fetal vascular malperfusion (fetal thrombotic vasculopathy), global/partial fetal vascular malperfusion (UC accident), chronic villitis (VUE) with obliterative fetal vasculopathy, acute chorioamnionitis with severe fetal cellular inflammatory response, multiple placental lesions |

*UC*, umbilical cord; *VUE*, villitis of unknown etiology.

*Redline. Classification of placental lesions. Am J Obstet Gynecol 2015.*

# Future Directions

- A simple, comprehensive, and widely accepted classification system
- Defining the clinical relevance of each phenotype
- To refine submission guidelines and decrease the number of unhelpful placental examinations

# Thank You
# "for your attention"

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