



The Placenta Pathology

Chapter 56

Abnormalities of the Placenta

- Major pathologic processes that can adversely affect pregnancy outcome
 - Intrauterine bacterial infections
 - Decreased blood flow to the placenta from the mother
 - Immunologic attack of the placenta by the mother's immune system



Intrauterine Infections

- **Result of migration of vaginal bacteria through the cervix into the uterine cavity**
 - **Most common**
- **Can lead to severe fetal hypoxia**
 - **A result of villous edema**
 - **“Fluid build-up within the placenta itself”**



Decreased Blood Flow

- **Severe fetal damage and even death**
 - **As a result of**
 - **Chronic decreased flow**
 - **Acute decreased flow**



Immune Attack

- **Placenta is a barrier between the mother and fetus**
 - **Protecting the fetus from immune rejection by the mother**
- **Can lead to intrauterine growth restriction or even demise**

Other Placental Insults

- **Can adversely affect pregnancy outcome by affecting the function of the placenta**
 - **Placental separation**
 - **Cord accidents**
 - **Trauma**
 - **Viral and parasitic infections**

Small Placenta

- **Thin, measuring <2 cm**
- **Primary causes**
 - **Small for dates fetus or IUGR**
 - **Chromosomal abnormalities**
 - **Severe intrauterine infection**
 - **Several maternal diabetes mellitus**
 - **Maternal hypertension**
 - **Maternal toxemia**
 - **Vascular infarction**

Placentomegaly

- **Enlarged placenta**
 - Weighing more than 600 g
- **Sonographically**
 - Placenta thickness measures more than 4 cm
- **Primary causes**
 - Maternal diabetes
 - Rh incompatibility
 - Placental hemorrhage
 - Hydrops
 - Infection
 - Aneuploidy
 - Triploidy

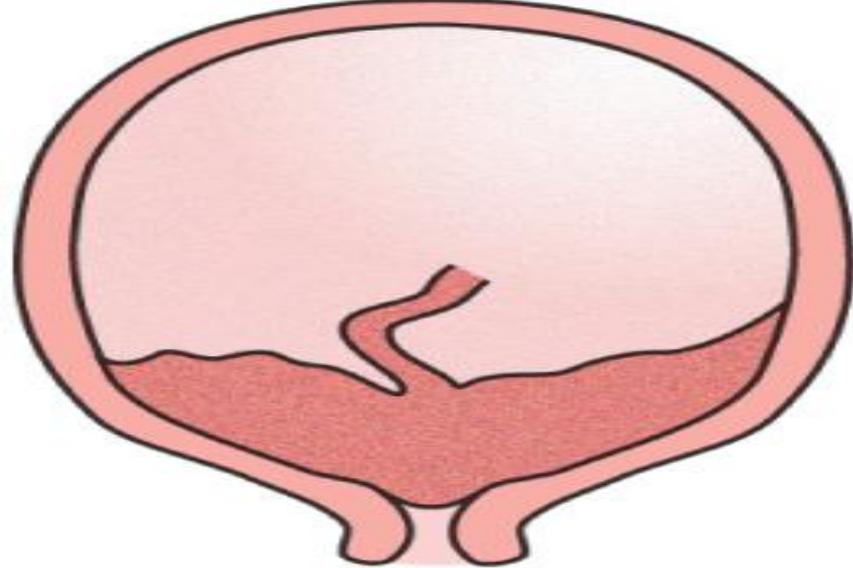
Placenta Previa

- **Placenta normally implants in the body of the uterus**
- **1 out of every 200 pregnancies the placenta implants over or near to the internal os of the cervix**

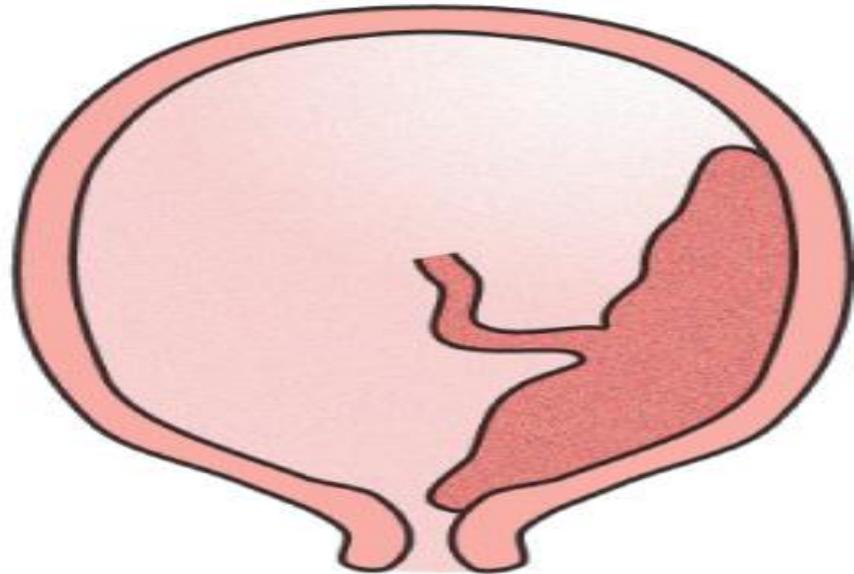


Types of Previa

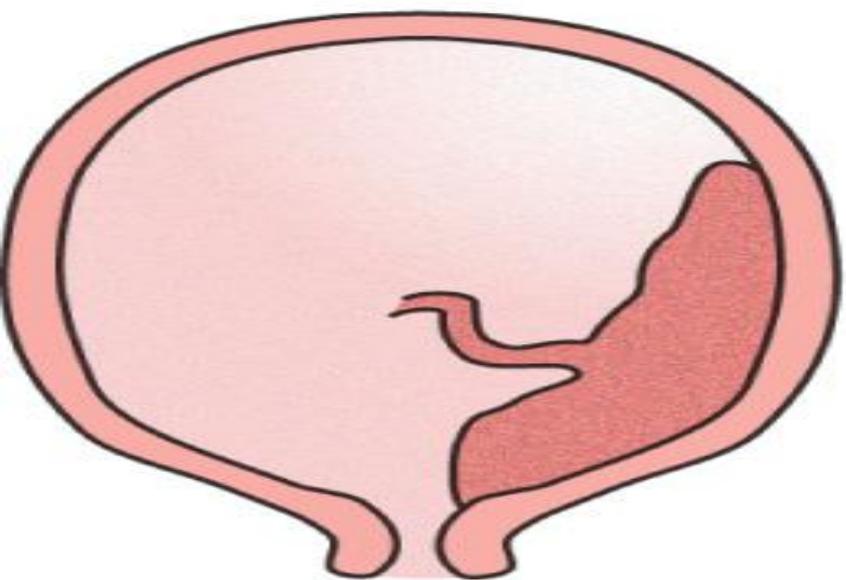
- **Complete or total previa**
- **Partial previa**
- **Marginal previa**
- **Low-lying placenta**



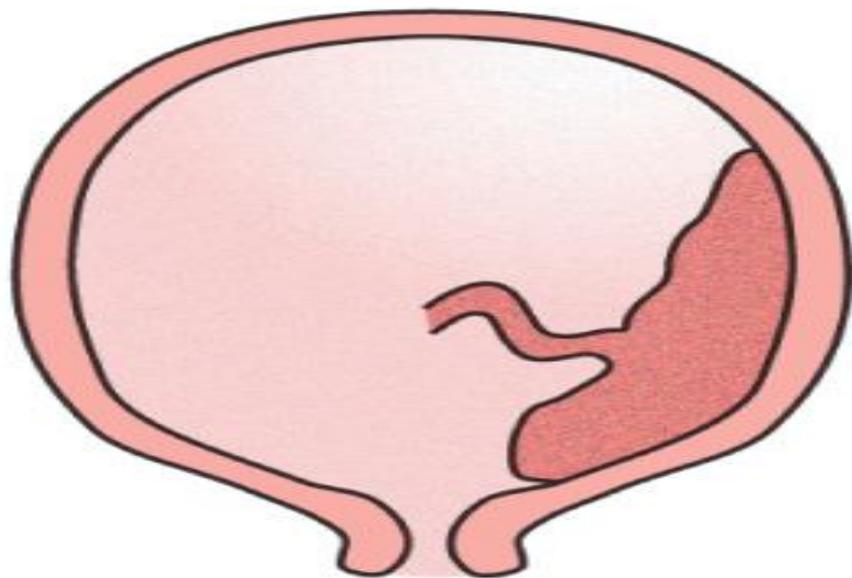
Complete previa



Partial previa



Marginal previa



Low-lying placenta

■ Complete previa

- Cervical internal os is completely covered by placental tissue
- 20% of patients with previa

■ Partial previa

- Partially covers the internal os

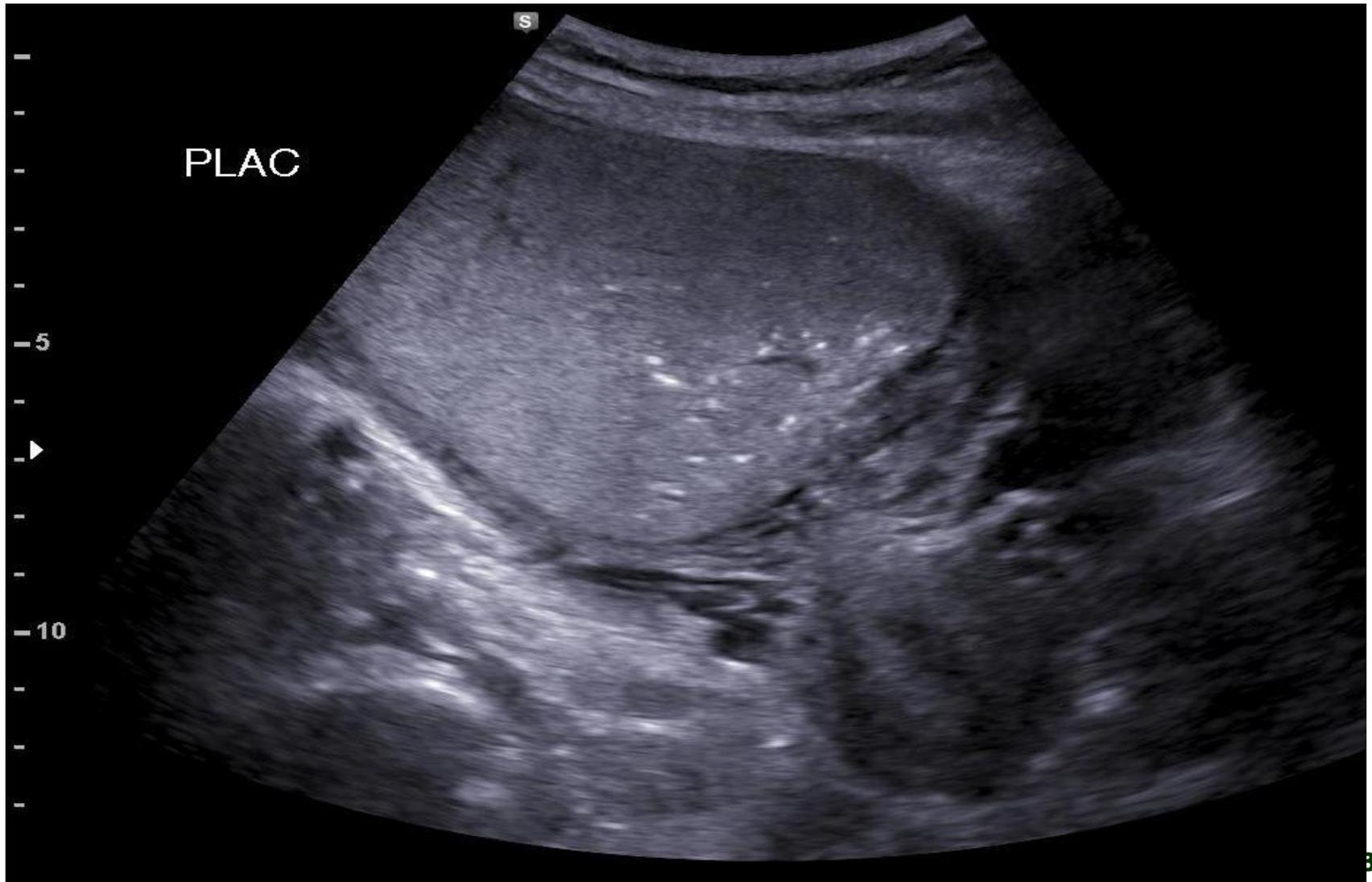
■ Marginal previa

- Does not cover the os but its edge comes to the margin of the os

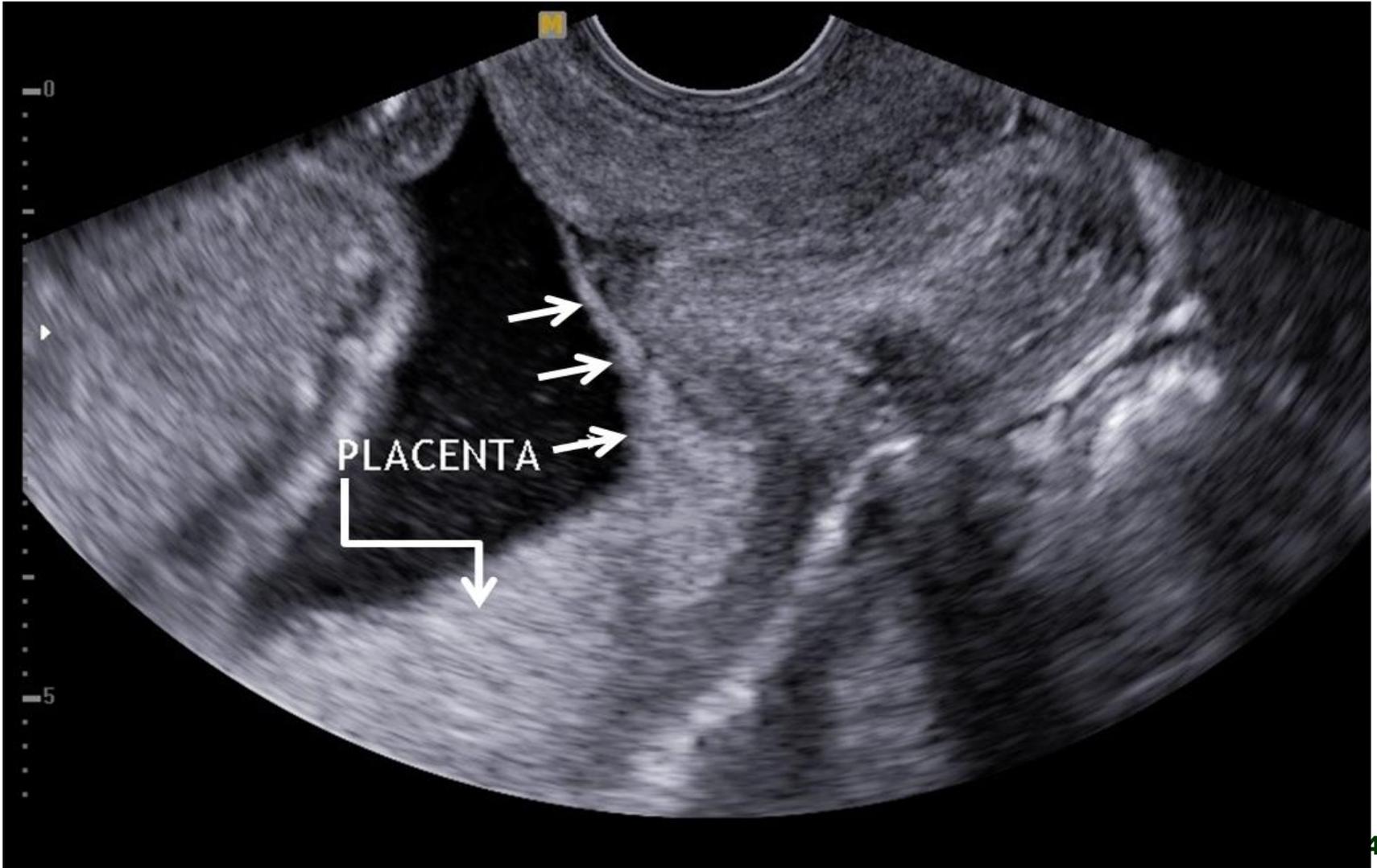
■ Low-lying placenta

- Implanted in the lower uterine segment, its edge is within 2 cm of the internal os

Complete Previa



Placenta Previa



Low-lying Placenta



- 
- **As the pregnancy progresses into the third trimester, two very important changes occur:**
 - **Lower uterine segment is developing, thinning and elongating in preparation for labor**
 - **As the lower uterine segment develops, the placental attachment to the lower uterine wall may be disrupted, resulting in bleeding**
 - **Cervix softens and some dilation can occur before the onset of labor**
 - **Cervical dilation also may disrupt the attachment of a placenta located over or near the cervical os**

Complications of Placenta Previa

- **Premature delivery**
- **Life-threatening maternal hemorrhage**
- **Increased risk of placenta accreta**
- **Increased risk of postpartum hemorrhage**
- **Intrauterine growth retardation**

- **Third trimester bleeding diagnosis is imperative**
 - **Treatment will be different based on the clinical diagnosis**
 - **Placental abruption**
 - **Obstetrician will deliver the fetus or it may die**
 - **Preterm fetus, mother not bleeding heavily**
 - **Conservative with transfusion and close observation until**
 - **The point at which the fetus is mature**
 - **The pregnancy must be terminated because of bleeding**

- **Sonographer must be cautious to examine the lower uterine segment in relation to the location of the placenta**
 - **Maternal urinary bladder may be used as a landmark to identify the location of the internal cervical os**
 - **Be cautious of misinterpreting a low-lying placenta covering the internal os secondary to an overdistended bladder**
 - **Patient should be asked to empty her bladder and the lower uterine segment should be rescanned to see the lower segment of the placenta in relation to the os**

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- **Focal uterine contractions may be misleading and a pitfall in diagnosing previa**
 - **Lower uterine segment should be scanned early in the ultrasound examination.**
 - **If a contraction occurs, go on with the normal examination and reexamine the lower uterine segment in 20 minutes**

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- **If fetus is vertex and in the last trimester of pregnancy**
 - **examine the fetal head in relationship to the posterior wall of the uterus and the mother's sacrum**
 - **A distance of less than 1.5 cm indicates**
 - **Not enough room for the placenta to be between the fetal head and posterior uterine wall**

LUS



+D 3.04cm

- **Transperineal approach is also useful in evaluating the lower uterine segment**
 - **Endovaginal transducer is ideal**
- **Transducer placed along the maternal labia to demonstrate**
 - **Maternal bladder**
 - **Internal os lower uterine segment**
 - **Fetal head**
 - **Placenta**

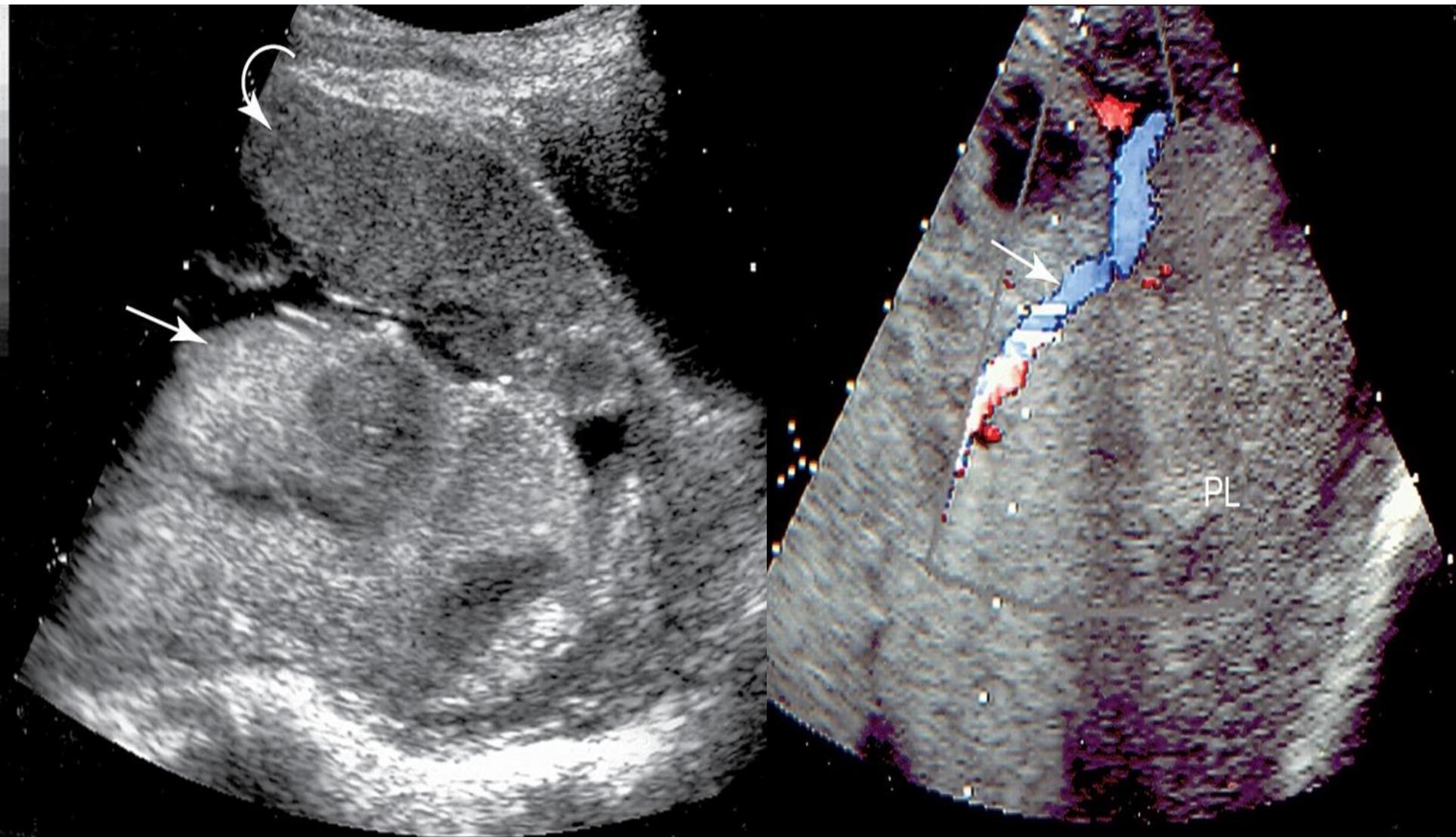
Vasa Previa

- **Vasa previa is a potentially life-threatening fetal complication**
- **Occurs when large fetal vessels run in fetal membranes across the cervical os**
 - **Vessels at risk of rupture and life-threatening hemorrhage**

Vasa Previa

- **Most common causes of vasa previa:**
 - **Velamentous insertion of membranes that crosses the cervix**
 - **Succenturiate lobe that has connecting vessels traversing the cervix**
- **During delivery, unsupported fetal vessels are prone to tearing**
 - **Requires rapid cesarean delivery**
 - **Can result in exsanguination of fetus**

Vasa Previa



Placental Invasion

- **Abnormal penetration of placental tissue beyond endometrial lining of uterus**
- **Variants of placental invasion:**
 - **Placenta accreta**
 - **Placenta increta**
 - **Placenta percreta**

Placenta Accreta

- **Abnormal adherence of part or all of the placenta with**
 - **Partial or complete absence of the decidua basalis**
 - **Chorionic villi attach to myometrium without muscular invasion**
- **Risk of placenta accreta increases in patients with placenta previa**
- **Occurs 1 in 2,500 deliveries**



- **Placenta increta**

- **Further extension of the placenta through the myometrium**

- **Placenta percreta**

- **Penetration of the uterine serosa**

- **Placental vessels can extend into urinary bladder**

- **These conditions result from the underdeveloped decidualization of the endometrium**

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- **Association of placenta previa reflects the poorly formed decidua of LUS that allows deeper invasion by the trophoblast**
 - **Previous cesarean scar also permits invasion**
 - **High mortality and morbidity with placenta increta/percreta**
 - **Transperineal approach may help to further define**
 - **Lower uterine segment (LUS)**
 - **Vascularity of the placenta in relationship to the maternal bladder**

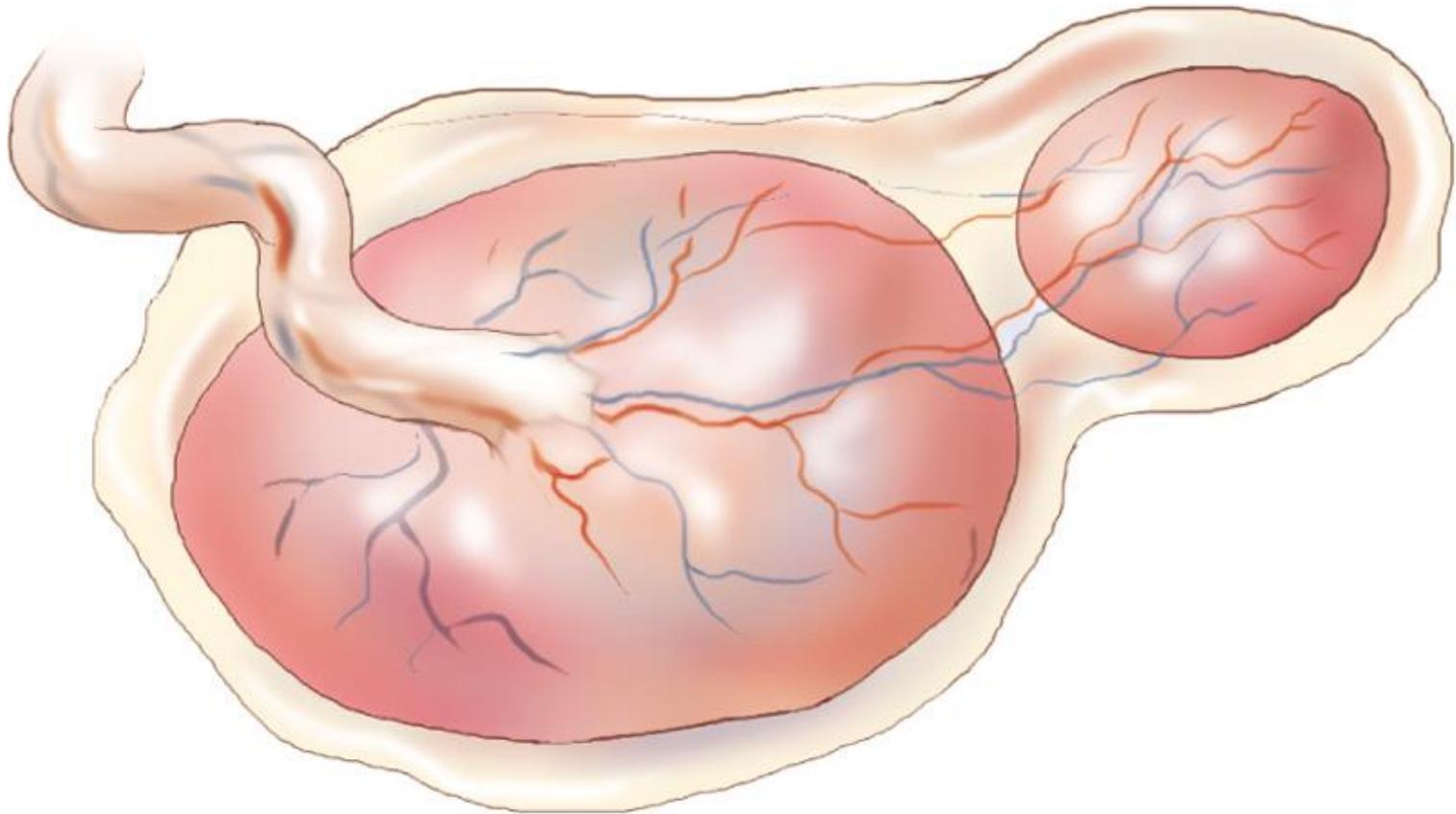
Succenturiate Placenta

- Presence of one or more accessory lobes connected to the body of the placenta by blood vessels
 - Lobes have a tendency to develop infarcts and necrosis (50% of deliveries)
 - May create a “placenta previa” or be retained in utero after delivery
 - May result in postpartum hemorrhage and infection
 - Rarely, rupture of the connecting vessels may occur during delivery
 - Causing fetal hemorrhage and demise

Succenturiate Placenta

- Look for discrete lobe that has “placenta texture” but is separate from the main body of the placenta
- With color flow Doppler
 - Vascular bands are seen connecting the lobes
- Varies in appearance
 - May be as large as the main lobe of the placenta
 - May appear as two placentas

Succenturiate Placenta



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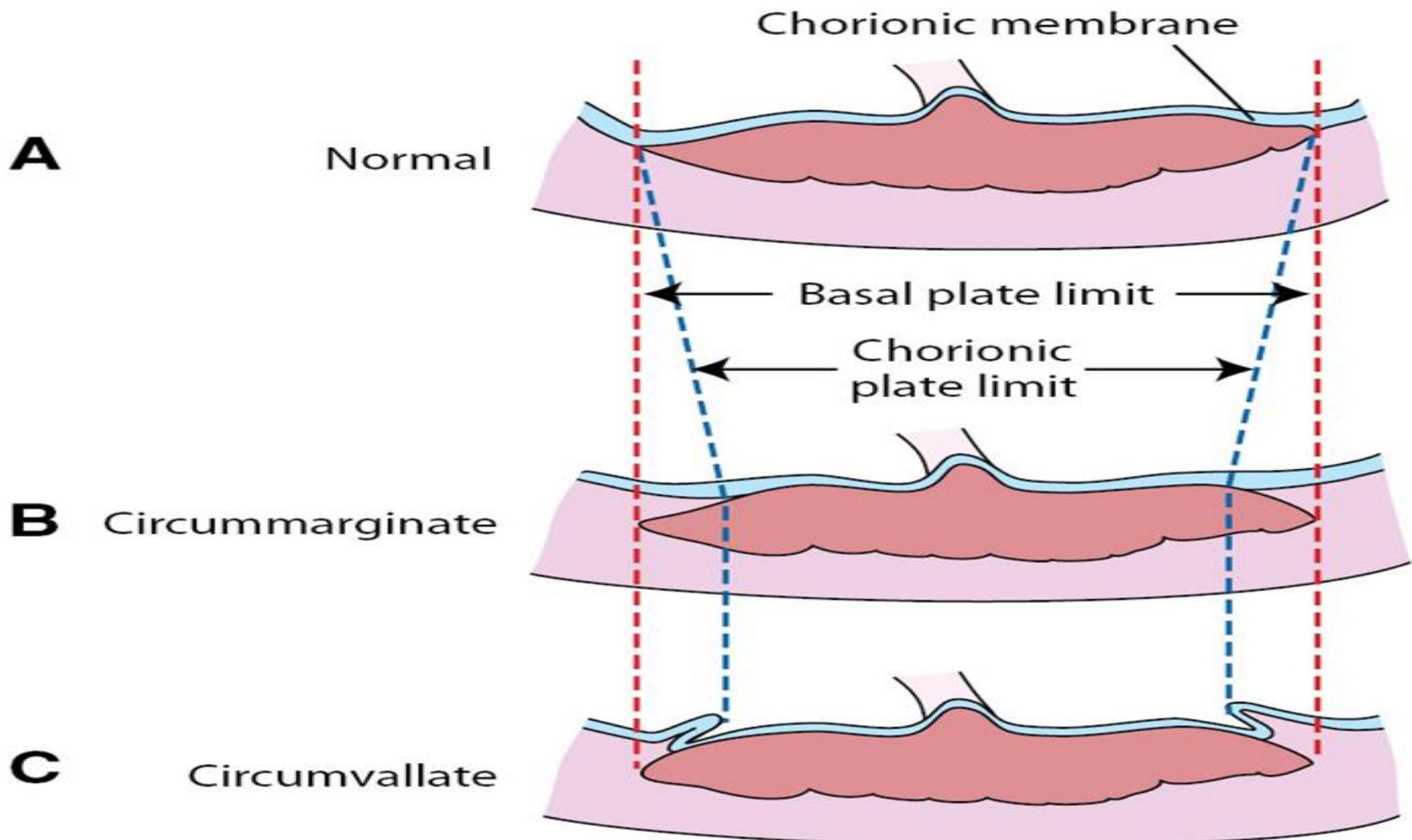
Succenturiate Placenta



Circumvallate/ Circummarginate Placenta

- Attachment of the placental membranes to the fetal surface of the placenta rather than the placental margin
- Diagnosed when the placental margin is
 - Folded
 - Thickened
 - Elevatedwith underlying hemorrhage

Circumvallate/ Circummarginate Placenta

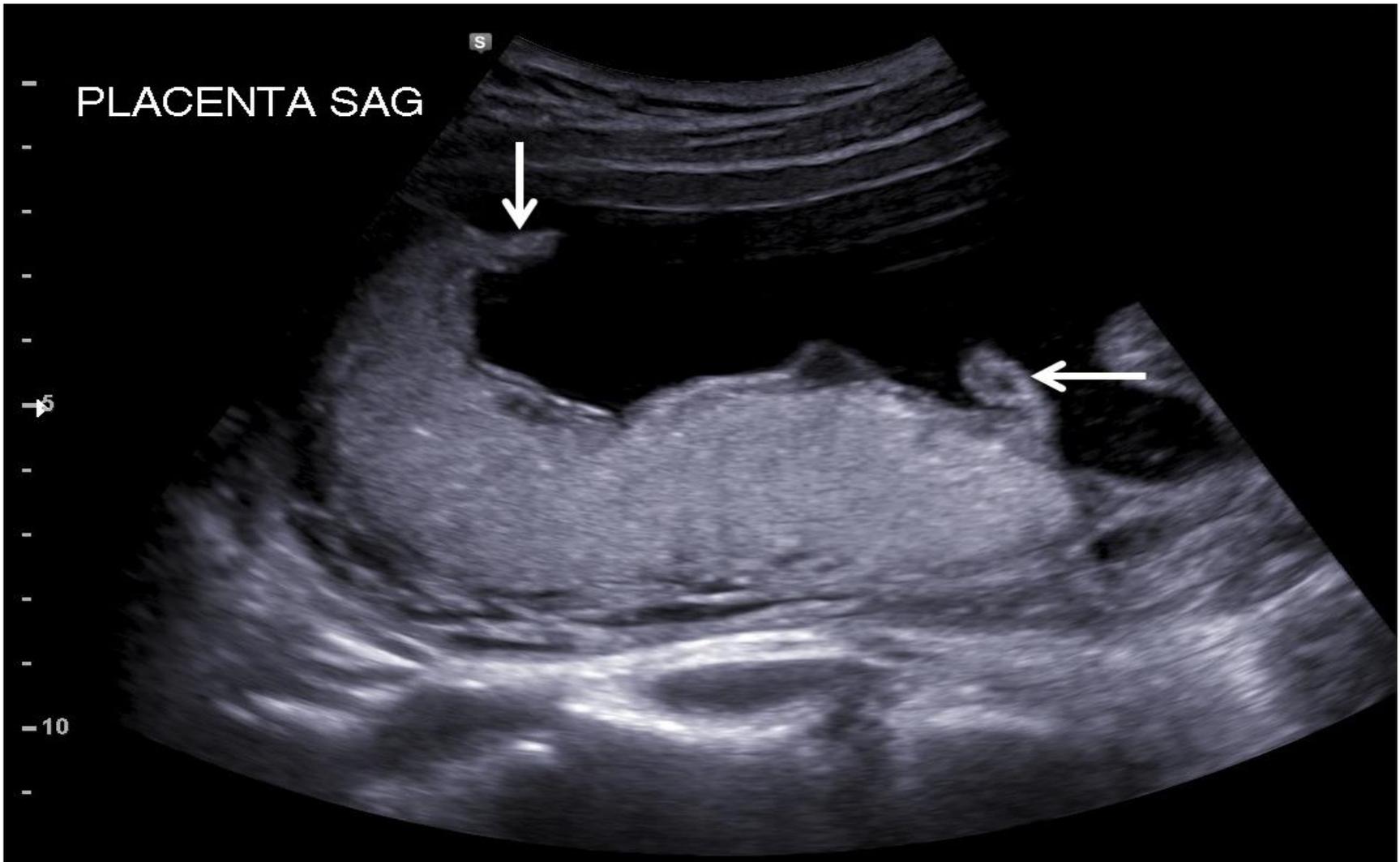




Circumvallate/ Circummarginate Placenta

- **Associated with:**
 - **Premature rupture of the membranes**
 - **Premature labor**
 - **Hemorrhage**
 - **Placental abruption**

Circumvallate Placenta



Placental Hemorrhage

- Refers to bleeding from the placenta from any cause
- More commonly seen than placental abruption
- Locations of placental hemorrhage include
 - Retroplacental
 - Subchorionic
 - Subchorial
 - Intraplacental



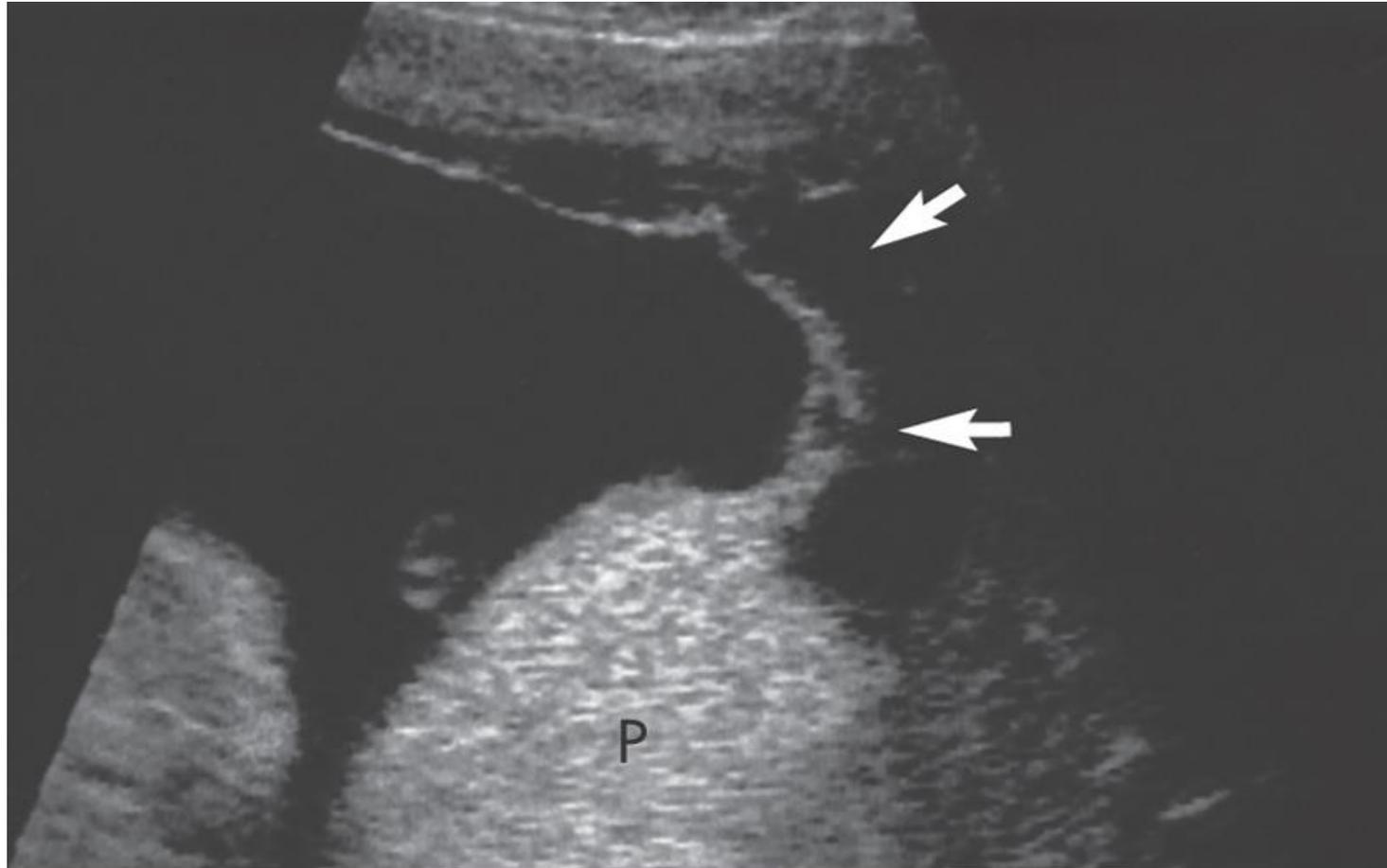
Placental Hemorrhage

- **First trimester more likely to resolve spontaneously than a lesion seen in the third trimester**
- **Sonographic appearance varies greatly with the location, size, and age of onset of hemorrhage**
- **May see an abnormality in the texture and size of the placenta**

Placental Hemorrhage

- If hemorrhage is present
 - Echogenicity depends on the age of the hemorrhage
 - Acute
 - Medium-level echogenic to isoechoic
 - Subacute
 - More hypoechoic
 - Chronic
 - More hypoechoic

Placental Hemorrhage

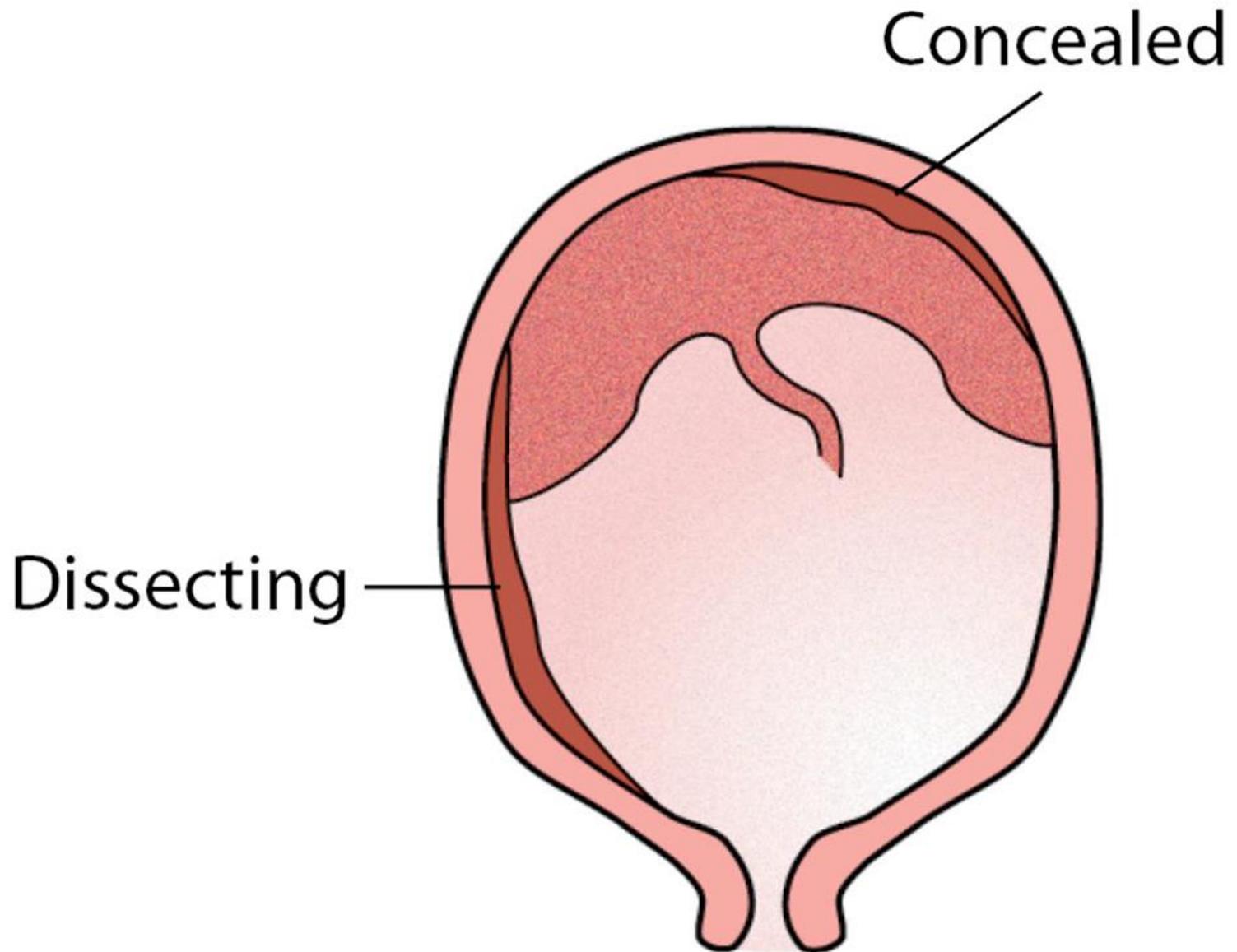


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Placental Abruption

- Premature placental detachment
- Occurs in 1 in 120 pregnancies
- Bleeding in the decidua basalis occurs with separation
- Mortality rate ranges from 20% to 60%
 - Accounts for 15% to 25% of perinatal deaths



Placental Abruption

- **Clinically the patient may present with any of the following signs:**
 - preterm labor
 - vaginal bleeding
 - abdominal pain
 - fetal distress or demise
- **Abruptio placenta may be further classified as retroplacental or marginal**

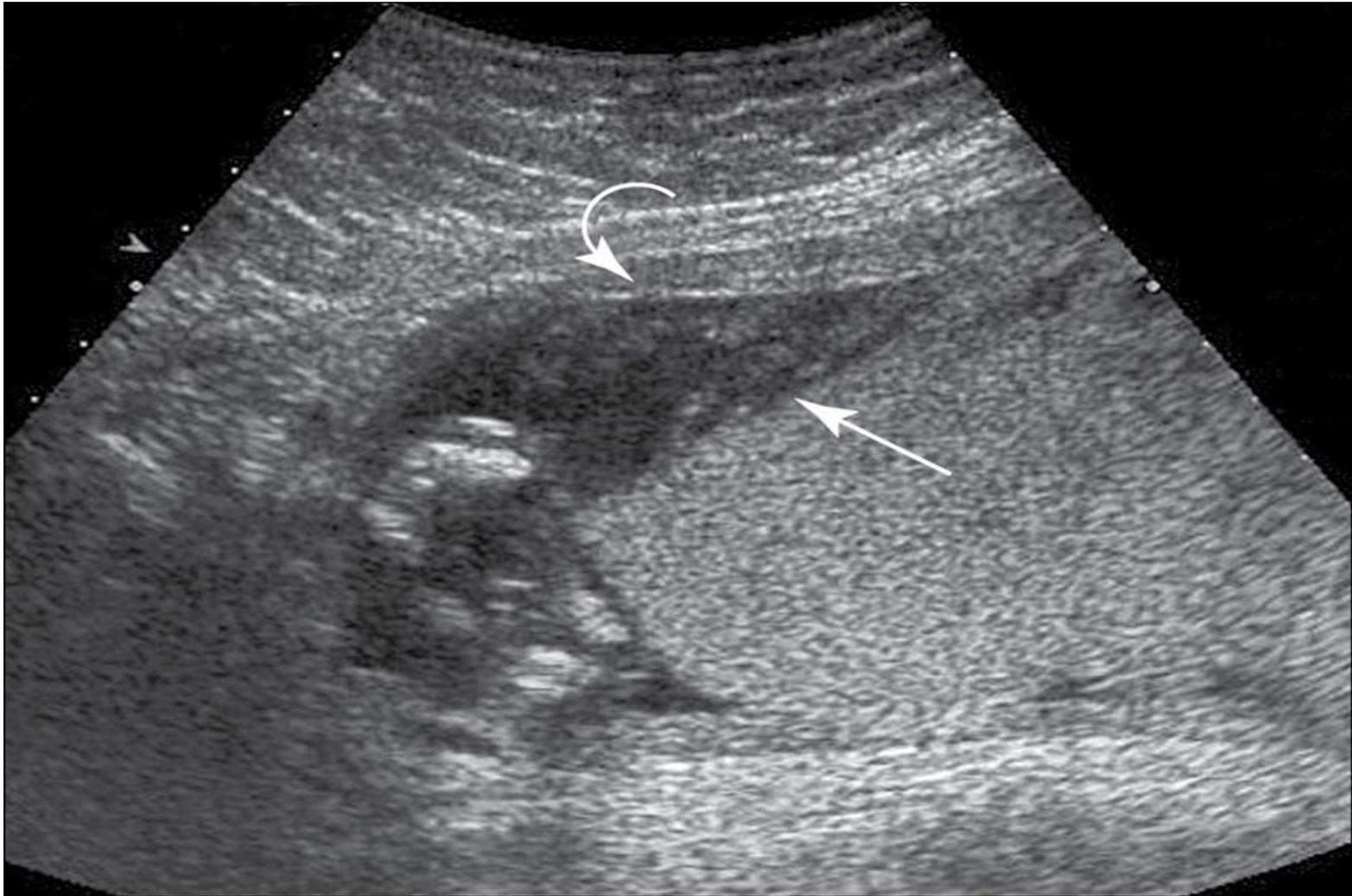
Placental Abruption

- **Maternal hypertension is seen in 50% of severe abruptions**
- **Other risk factors include previous history of:**
 - **Abruption**
 - **Trauma**
 - **Perinatal death**
 - **Placenta previa**
 - **Short umbilical cord**
 - **Cocaine**
 - **Premature delivery**
 - **Other drugs**
 - **Fibroids**

Retroplacental Abruptio

- Results from the rupture of spiral arteries and is a “high-pressure” bleed
 - Associated with hypertension and vascular disease
- If the blood remains retroplacental
 - Patient has no visible bleeding

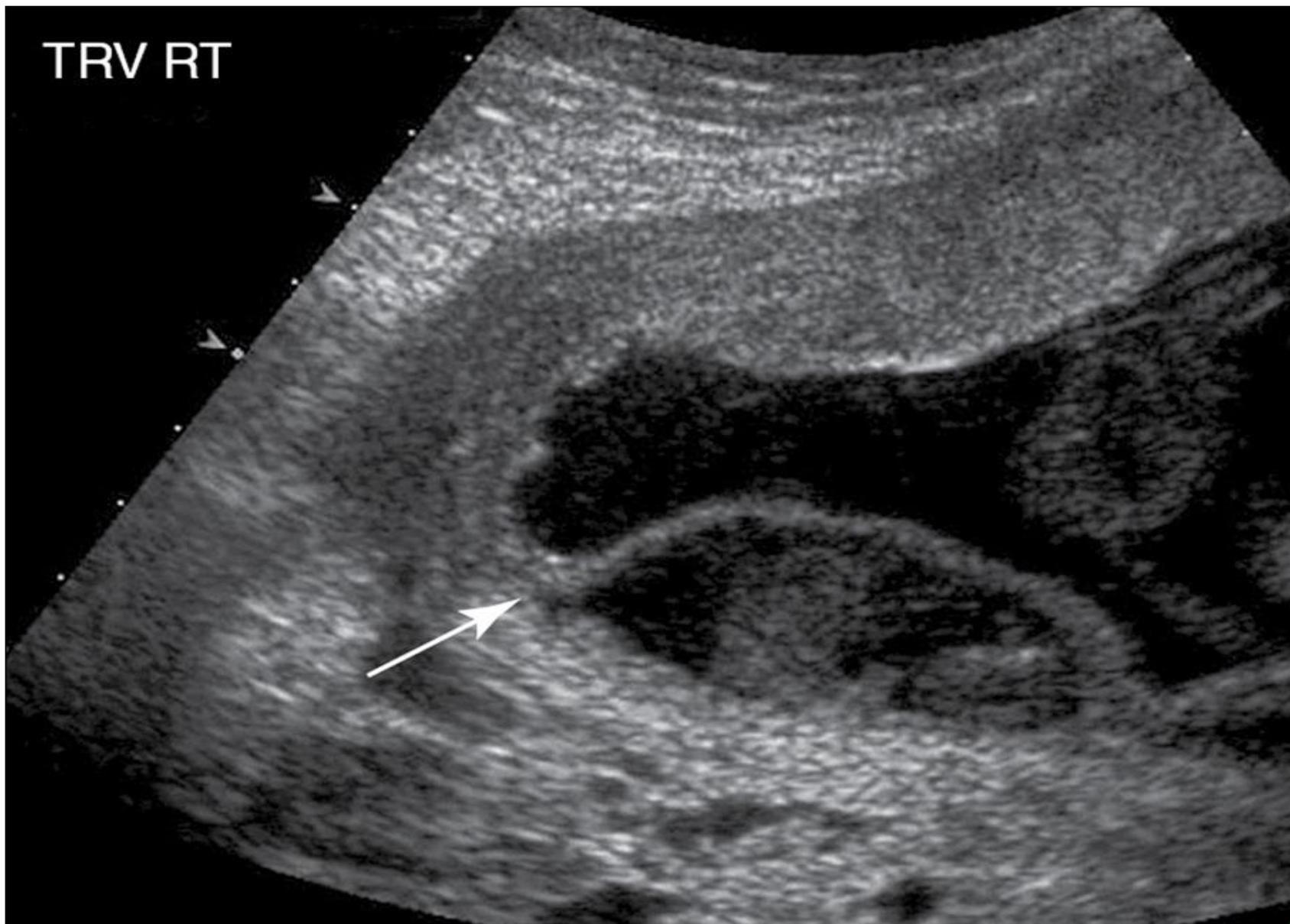
Retroplacental Abruption



Marginal Abruptio

- Results from tears of the marginal veins and represents a “low-pressure” bleed
- Dissects beneath the placental membranes
 - associated with little placental detachment
- Subchorionic hemorrhage accumulates at the site separate from the placenta

TRV RT



Intervillous Thrombosis

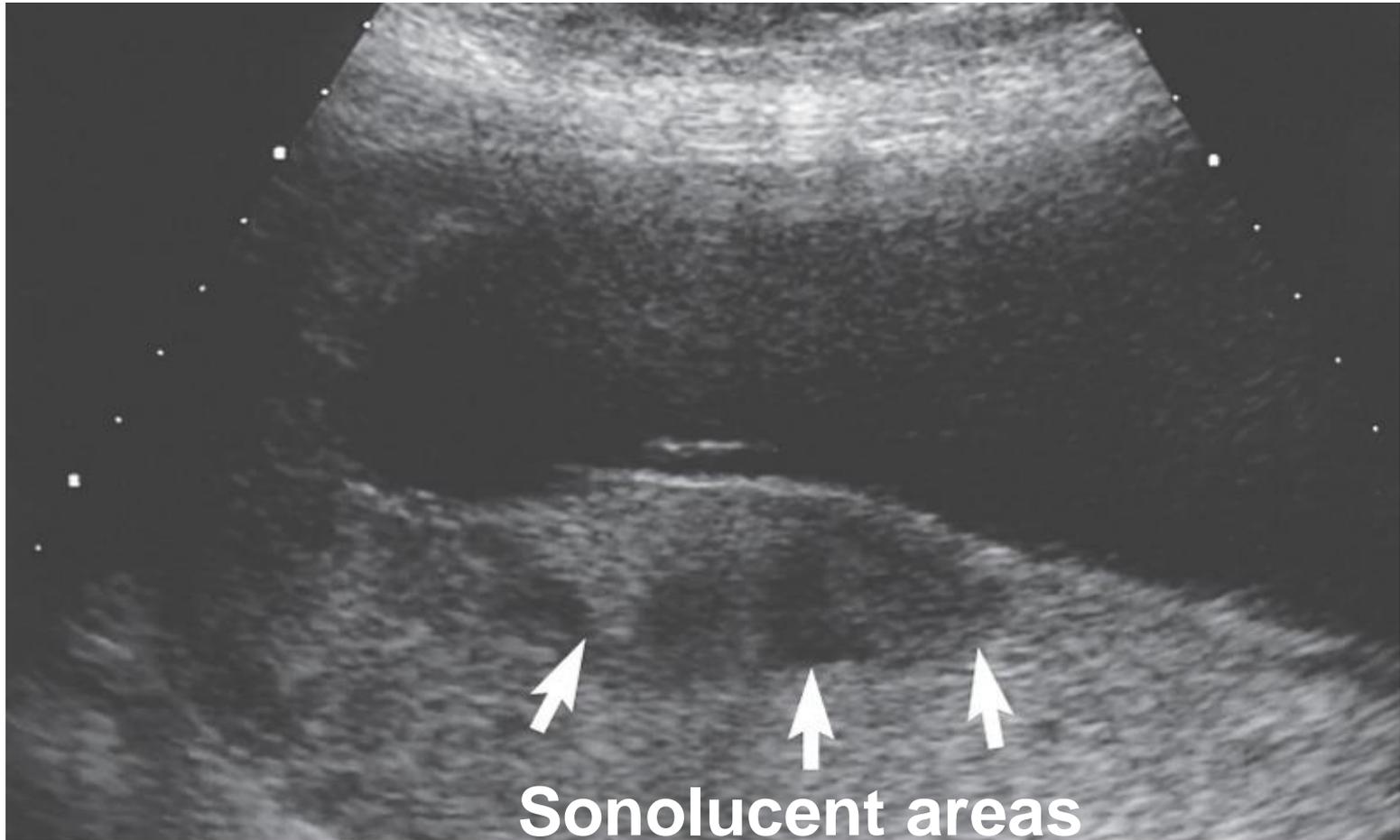
- **Presence of thrombus within the intervillous spaces**
 - Occurs in one third of pregnancies
 - Results from intraplacental hemorrhage caused by breaks in the villous capillaries
- **Usually there is little risk to the fetus**
 - Condition is associated with Rh sensitivity and elevated alpha-fetoprotein (AFP) levels from a fetal–maternal hemorrhage



Intervillous Thrombosis

- **Sonographically**
 - **Sonolucencies seen within the homogeneous texture of the placenta**
- **Lucencies increase with advanced gestational age and indicate maturity of the placenta**

Intervillous Thrombosis



Placental Infarcts

- **Focal discrete lesion caused by ischemic necrosis**
- **Occurs in 25% of pregnancies with no clinical significance**
- **Large infarcts may indicate underlying maternal vascular disease**
- **Evolve through acute, subacute, and chronic stages**



Placental Tumors



Gestational Trophoblastic Disease

- Encompasses disease processes that originate in placenta
- Commonly known as “molar” pregnancy
- Types of molar pregnancy:
 - Complete or partial mole
 - Choriocarcinoma
 - Invasive mole



Gestational Trophoblastic Disease

- **Clinical symptoms include**
 - **Extreme nausea and vomiting**
 - **From elevated levels of hCG**
 - **Vaginal bleeding**
 - **Uterine size larger than dates**



Gestational Trophoblastic Disease

■ Sonographically

- Uterine size larger than dates
- No identifiable fetal parts
- Inhomogeneous texture of the placenta
 - Represents the multiple vesicular changes throughout the placenta
- Bilateral theca lutein cysts are seen in the ovaries
 - Secondary to the hyperstimulation of the elevated hCG



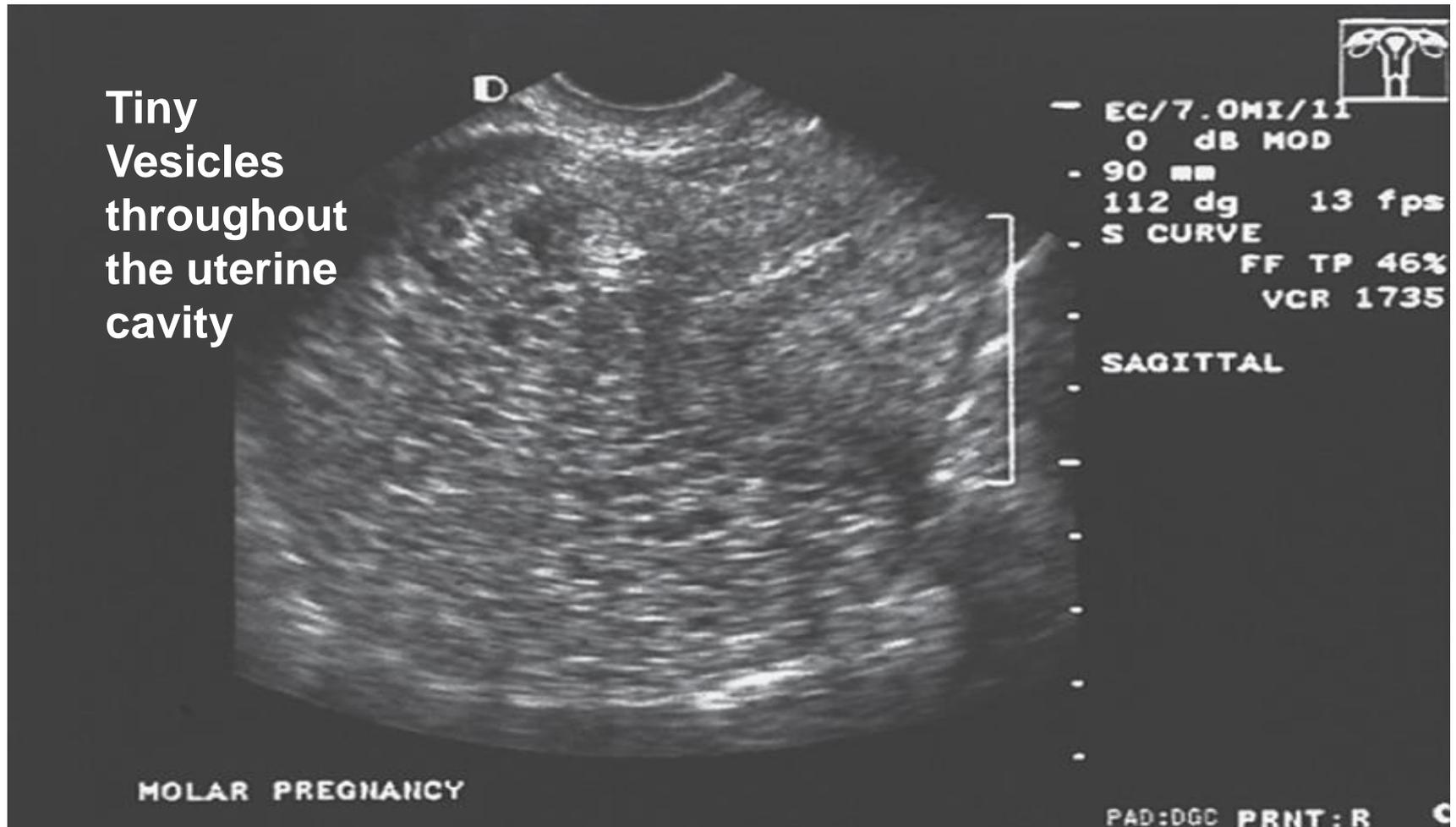
Gestational Trophoblastic Disease

- **Complete moles generally have diploid karyotype and no fetal tissue**
- **Partial (incomplete) mole usually have a triploid karyotype and fetal tissue is often present**
 - **Associated with an abnormal fetus or fetal tissue**

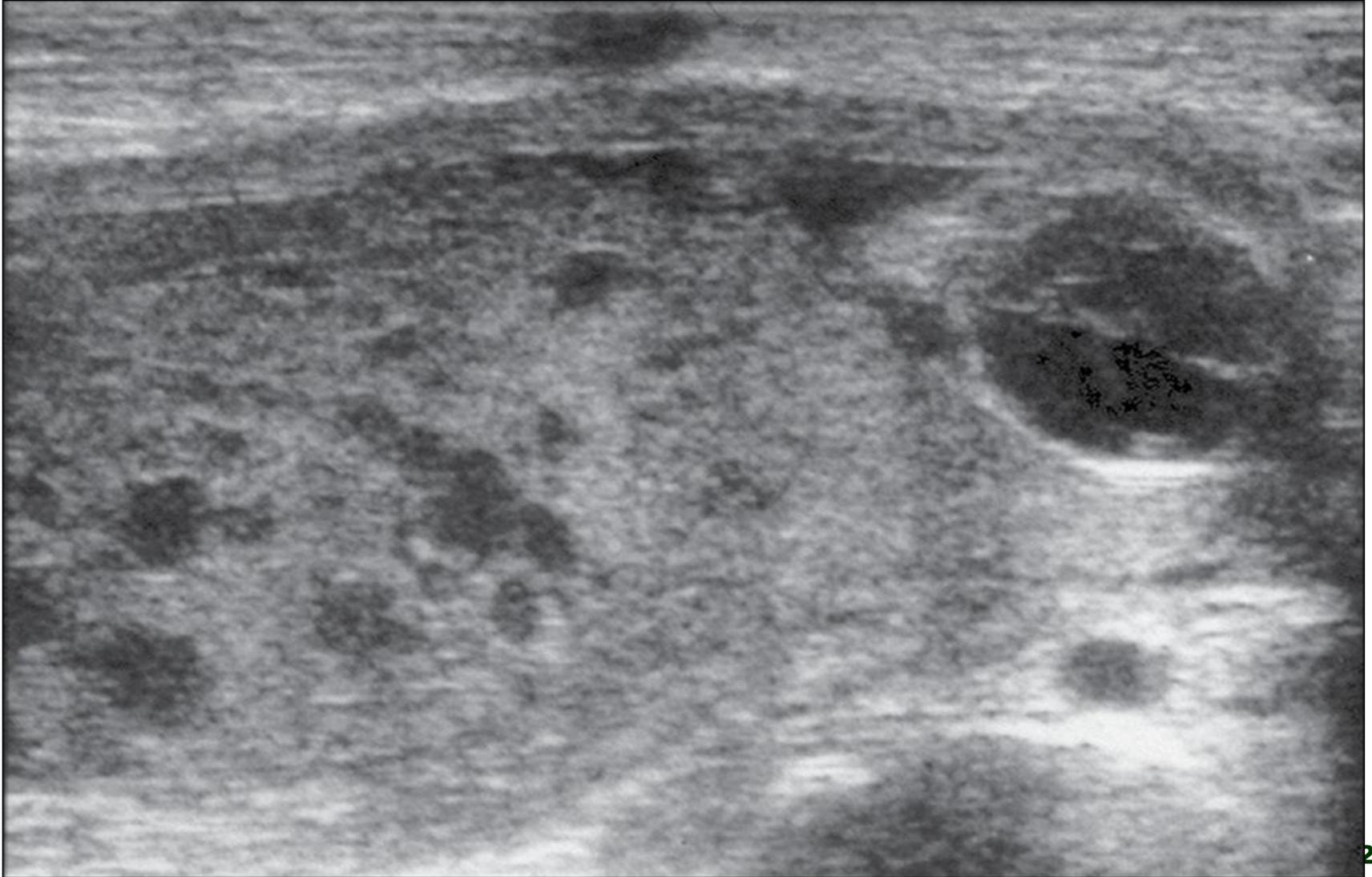
Gestational Trophoblastic Disease

- **Coexistent mole and fetus is very rare**
 - Mole may result from a hydatidiform degeneration of a twin fetus
 - Condition is more likely when two placentas are present
 - Abnormal placenta is hyperechoic with multiple small cysts
 - Coexisting fetus is live with a normal placenta

Complete Mole



Partial Mole



Chorioangioma

- **Second to trophoblastic disease**
 - Chorioangioma is the most common “tumor” of the placenta
- **Tumor is usually:**
 - Small
 - Consists of a benign proliferation of fetal vessels
 - Majority are capillary hemangiomas that arise beneath the chorionic plate

Chorioangioma

- **Complications include**
 - **Polyhydramnios**
 - **Fetal hydrops**
 - **Fetal cardiomegaly**
 - **Intrauterine growth restriction**
 - **Fetal demise**
- **Maternal serum AFP may be elevated**

Chorioangioma

- **Sonographically**

- Shows a circumscribed solid or complex mass that protrudes from the fetal surface of the placenta

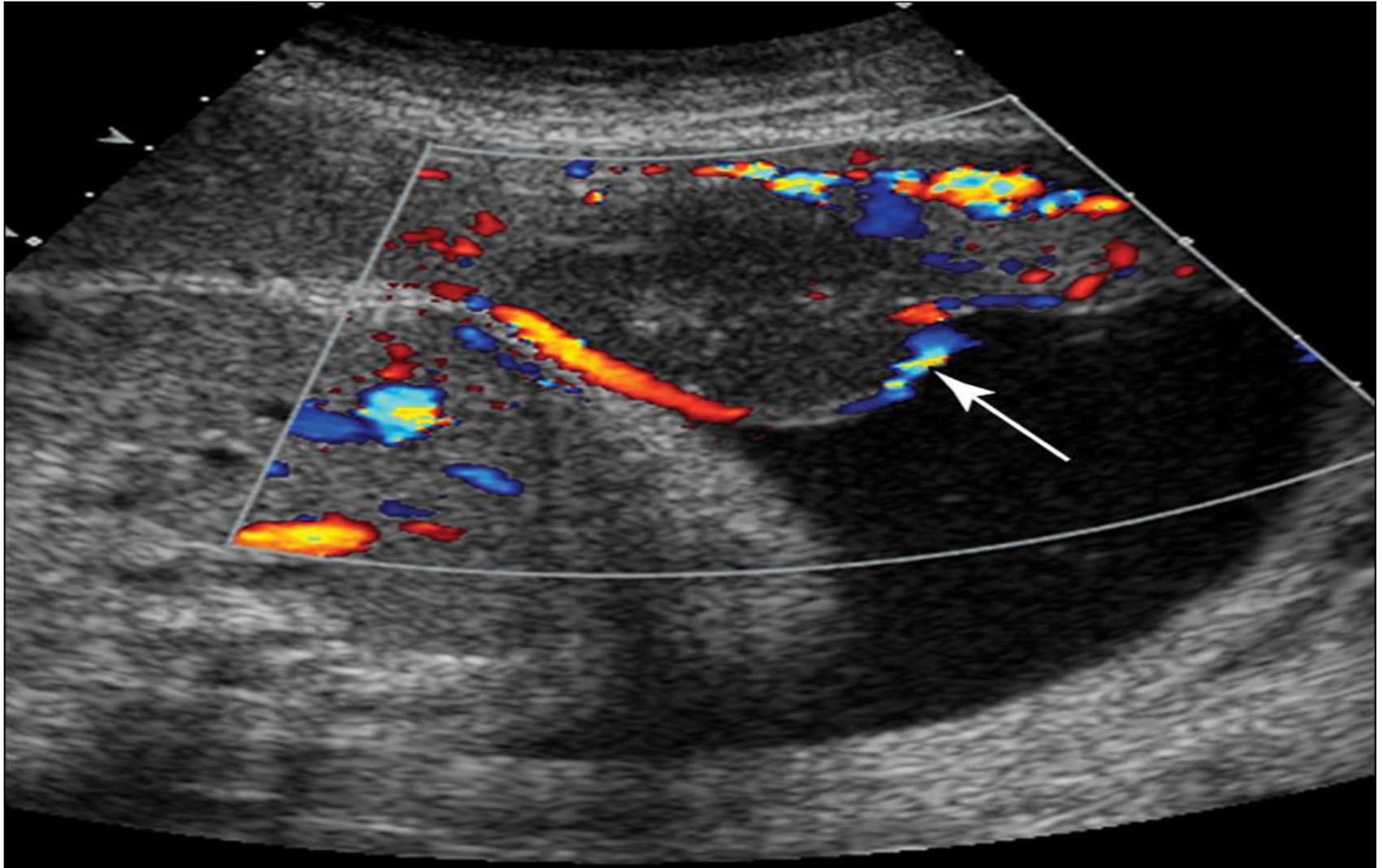
- **May be located near the umbilical cord site**

- **Evaluate for**

- Polyhydramnios

- Fetal hydrops

Chorioangioma



Placenta in Multiple Gestations

- **Monozygotic twins are associated with all three types of membranes:**
 - Dichorionic/diamniotic (di/di)
 - Monochorionic/diamniotic (mo/di)
 - Monochorionic/monoamniotic (mo/mo)
- **To differentiate the type of multiple gestations present carefully scan to determine**
 - Site of the placenta
 - Number of the placentas

Placenta in Multiple Gestations

- **Di/di: pregnancy probably dizygotic (97% chance)**
- **Diamniotic/dichorionic/two placentas can occur in monozygotic pregnancies when division occurs during first 4 days of gestation**
- **Mono/di or mono/mono: from monozygotic pregnancy**

Placenta in Multiple Gestations

■ Dizygotic (Fraternal twins)

- Derived from two zygotes
- Diamniotic/dichorionic/two placentas

■ Monozygotic (Identical twins)

- Derived from one zygote
- Diamniotic/dichorionic/two placentas
 - Occurs within first 4 days of gestation
- Monochorionic/diamniotic/one placenta
 - Occurs during first week of gestation
- Monochorionic/monoamniotic/one placenta
 - Occurs during second week of pregnancy