Succenturiate Placental Lobe Abruption: a placental pathology complicating a dangerous delivery

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Disclosure Statement

- I have no relevant financial relationships related to the content of this presentation to disclose.

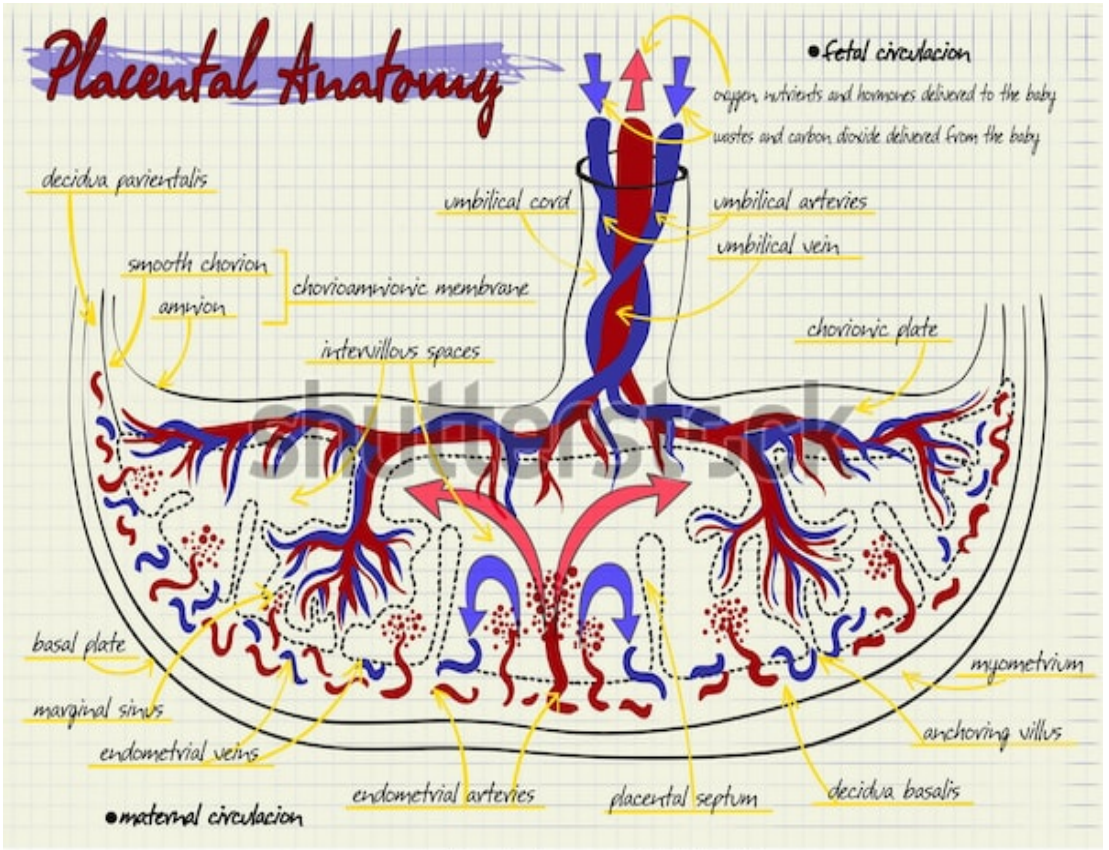
Objectives

- Briefly discuss the embryological development of the placenta.
- Discuss what an abruption is and causes.
- Understand when a succenturiate lobe of a placenta occurs.
- Realize that the exposed vessels of the succenturiate lobe of the placenta are usually associated with poor outcomes.
- Management of abruption of the succenturiate lobe of the placenta.

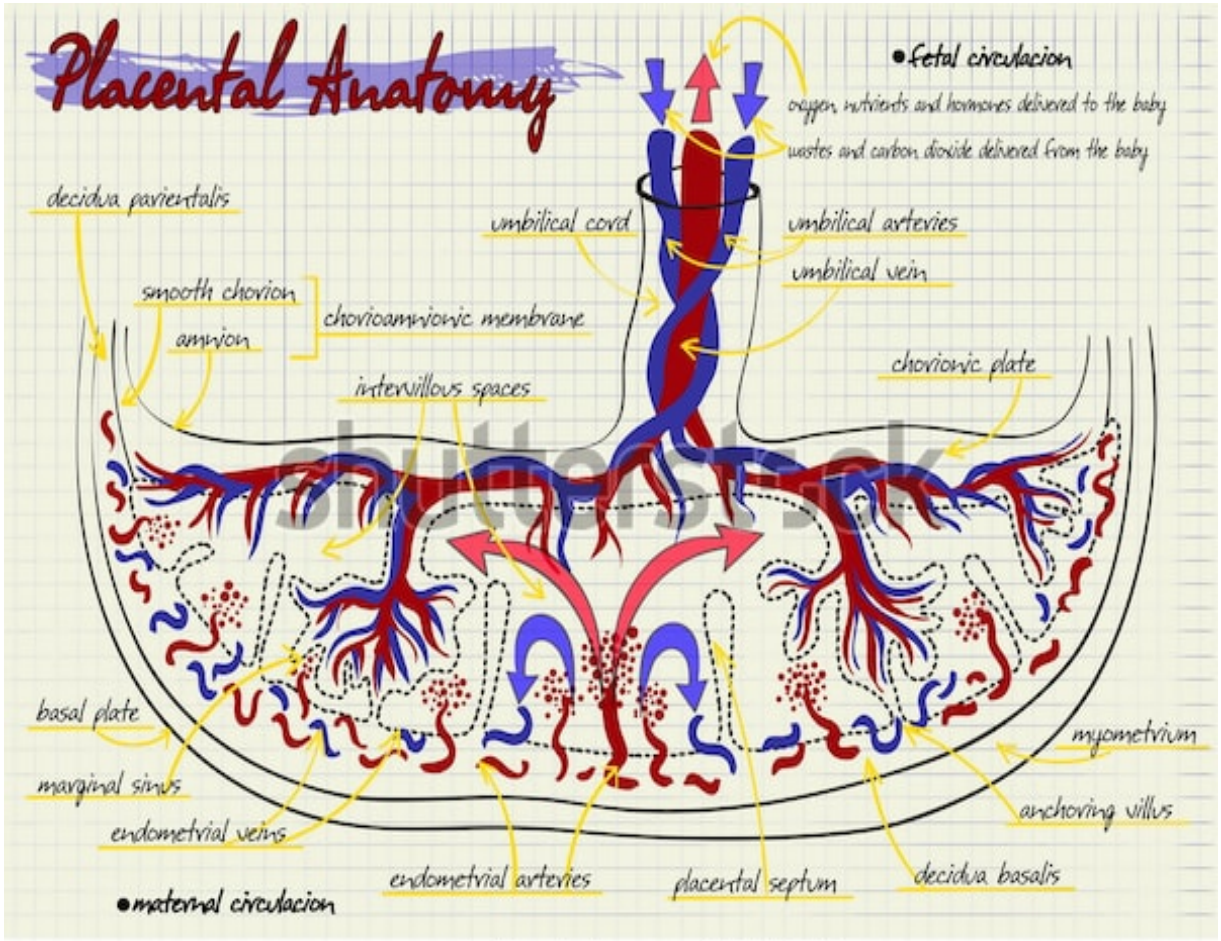
Introduction

Placenta Development

- Composed of both maternal and embryonic tissue.
- Trophoblasts invade the endometrium and differentiate into:
  - inner cytotrophoblastic (CTB) layer
  - outer multinucleated syncytiotrophoblastic (SCTB) mass[1,2]
- SCTB layer invades the endometrial connective tissue.[1]
- By 13-14 days: The CTBs envaginate the SCTB layer forming chorionic villi.[1,2]
- This creates maternal-fetal circulation by five weeks of gestation.[2]



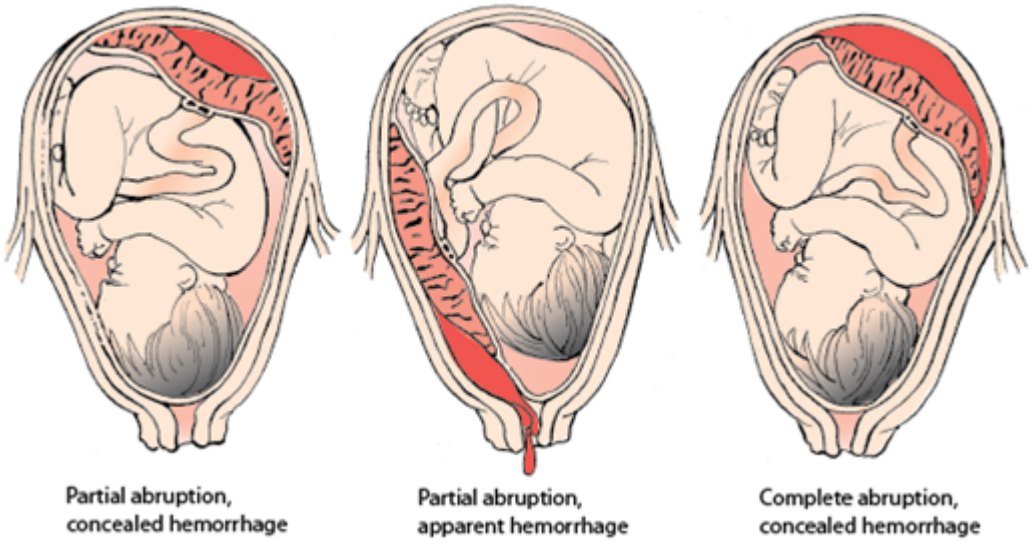
Placenta Development



- By 8 weeks: Placental bed forms (Decidua Basalis).[1,2]
- Decidual Reaction restrains the invasive blastocyst[3] and villi atrophy on the Decidua Capsularis.[1,2]
- By 10-12 weeks, the maternal spiral arteries bring oxygen rich blood.[1]
- By 3 months: Placental cotyledons are formed by partitioning of the villi and in-folding of the decidua basalis.[2]

Abruption

- Placental abruption complicates 1% of births[13] and 10% of preterm births.[1]
- Occurs when the maternal portion of the decidua-basalis prematurely separates from the endometrium causing vascular compromise and hemorrhage.[6,7,13]
- As blood accumulates, it forces further separation.[6]
- Clinical presentation is dependent upon:
  - location (central or marginal)
  - severity (partial or complete)
- Can be primarily grouped into:
  - vascular etiologies
  - mechanical etiologies



Causes of Abruption
(Table 1)

Vascular Issues

Poor Placentation
Leiomyoma
Placental Previa
Previous Cesarean Delivery
Coagulaopathy
Factor V Leiden Deficiency
Hyperhomocysteinemia
MTHFR, homozygous
Prothrombin Mutation

Mechanical (stretching/sheering) Issues

Sudden Uterine Decompression
Multiple Gestation
Polyhydramnios
Trauma
Direct Blow to the Abdomen
External Cephalic Version
Fall
Motor Vehicle Accident
Short Umbilical Cord

Vascular Damage
Smoking
Hypertension (current or history)
Diabetes
Abruption History
Pre-Eclampsia
Maternal Age >35 yo
Cocaine-vasospasm

*MTHFR-Methyltetrahydrofolate Reductase

Case Presentation

“When she stood up, the blood ran out of her like a faucet”

- A 21 year old Gravida 3, Para 2002 at 34 5/7th weeks gestation, known for rapid deliveries, presented to labor and delivery triage by ambulance for vaginal bleeding.
- Maternal vital signs were initially stable.
- The fetal heart rate was category I with a baseline of 140 beats/min.
- External tocometer demonstrated painful contraction every three to four minutes.
- A bedside ultrasound showed a vertex term fetus with a posterior placenta.
- Vaginal exam demonstrated a moderate amount of bright red blood and her cervix of four centimeters dilation, 75% effacement and at 0 station.

Labor Management

- Two large bore IVs were placed, through which lactated ringers was infused.
- A complete blood count demonstrated a hemoglobin of 10.4 mg/dL. Two units of packed red blood cells were transfused to mitigate the continued blood loss burden.
- Coagulation studies were normal.
- As her cervix changed, the bleeding decreased but always persisted at a level greater than expected for normal bloody show.
- Antibiotics were started for her preterm status.
- Close continuous monitoring with a vaginal delivery was initially planned, but she was prepped for cesarean delivery prophylactically.

Delivery

- Amniotomy at eight centimeters was followed thirty minutes later by a precipitous delivery of a 4 pound 5 ounce female with APGARs of 8 & 9.
- The placenta delivered easily with gentle cord traction within seven minutes.
- A five to six centimeter succenturiate lobe was noted connected to an approximately 300cc clot.
- No evidence of Abruption was noted on pathologic examination of the main body of the placenta.
- The infant was taken to the NICU for monitoring, where she stayed for 10 days.

Discussion

Succenturiate Lobe of the Placenta

- Definition: One or more cotyledons developing imbedded in the amnion but apart from the main placental body.[3-5]
  - Roughly equal sized = Bi-lobed Placenta[2,3]
  - Smaller lobe = Succenturiate lobe
- Embryologically results from the persistence of proliferating villi on the decidua capsularis.[2,4,5]
- How it occurs:
  - abnormality during implantation of the blastocyst
  - poor nutrition or abnormalities in oxygen tension,[4,6]
  - damage to an intervening segment of the placenta[4,7]
- Vascular endothelial damage risk factors:
  - Implantation on previous scars or leiomyomas[8]
  - advanced maternal age and in vitro fertilization.[3-5,7,8]
- Vessels 'unprotected' by Wharton's Jelly are susceptible to:
  - compression (poor fetal growth, low infant birth weight and fetal distress)[4,7,9]
  - laceration (rapid fetal bleeding from membrane rupture and retention of products during the third stage of labor)[4,10-12]
- Antenatal ultrasound can detect this anomaly but a majority of SLP are diagnosed at delivery. [5,10]

Labor Management

- Vaginal bleeding with a firm, tender uterus, one must work under a presumptive diagnosis of abruption until a definitive diagnosis can be rendered at the conclusion of the third stage of labor.[6]
- With the presumptive diagnosis of an abruption, decisions regarding management balanced amongst:
  - relative maternal and fetal stability
  - cervical change
  - gestational age.[6,13,14]
- Continued pregnancy for antibiotics and lung maturity is warranted with maternal and infant stability in prematurity, but delivery is necessary with labor or instability in either patient.
- Management requires a combination of continuous monitoring and supportive care by:
  - giving oxygen
  - IV fluids
  - sometimes blood
  - BUT ultimately results in delivery.
- Vaginal delivery can be considered if:
  - delivery is not prolonged and maternal and fetal stability is maintained, but hemorrhage constantly threatens to disrupt that stability.[6,13]

Transfusions

- Assessment of blood volume status often is underestimated.[14]

- The magnitude of acute blood loss isn't reflected in the initial hemoglobin and hematocrit as maternal circulation must first come to homeostasis.[13]

- This expected decrease may necessitate transfusion at a higher hemoglobin level than usual to blunt this decrease and maintain a reassuring maternal blood pressure and fetal heart rate.

Conclusion

Effect of a Succenturiate Lobe of the Placenta

- More often, it is first identified at the time of delivery,[3,5,10] when the intervening cord is either compressed, causing decelerations in fetal heart rate pattern, or severed, leading to fetal exsanguination or placental retention.[3,4,10]

- The SLP abrupting kept the consequences for mother and infant from being more severe.

- The main portion of the placenta was sequestered from the sheering forces of the abrupting lobe and allowed for continued exchange of nutrients and wastes. Soon the bleeding from the SLP clotted and labor continued as expected, leading to a vaginal delivery.

Abruption Classification
(Table 2 [10, 14])

Class	0	1	2	3
Description	**Asymptomatic**	**Mild**	**Moderate**	**Severe**
Bleeding	None	None or Small	None or Moderate	None or Heavy
Uterus	Non-Tender	Slight Tenderness	Significant Tenderness	Tetanic Uterus
Maternal	Normal BP/HR	Normal BP/HR	Changes to BP/HR	Shock
Fetal	No Fetal Distress	No Fetal Distress	Fetal Distress	Fetal Death
Other	Found after Delivery		Clotting Profile Changed	Coagulopathy

Table 2: Characterizes abruption by rating system. Highlighted regions demonstrate this case's findings that span class 1 and 2, demonstrating the clinical findings of an abrupted succenturiate lobe of the placenta

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