

# **Obstetric Hemorrhage**

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# Lecture Organization

- Antepartum hemorrhage
  - Placenta previa
  - Vasa previa
  - Abruptio placentae
- Postpartum bleeding
  - Uterine atony
  - Laceration
  - Uterine inversion
  - Other

# Placenta Previa Definition

- Total - Internal os covered by placenta
- Partial - Internal os partially covered by placenta
- Marginal - The edge of placenta is at the margin of the internal os
- Low lying - Near the internal os

# Types of Placenta Previa



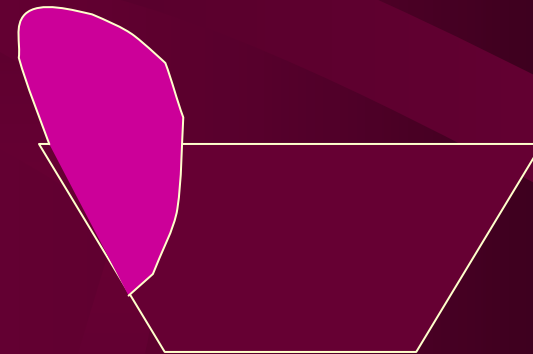
**Complete**



**Partial**



**Marginal**



**Low Lying**

# Placenta Previa - Factoids

- Incidence at approximately 0.3%-0.5%
- Occurs as consequence of zygote implantation
- Risk increased with:
  - Advanced maternal age
  - Prior C/S (at least 1.5 times higher)
  - Defective decidualization
  - Smoking (risk doubled)

# Placenta Previa - Accreta

- Placenta previa is associated with increased risk of placenta accreta (discussed subsequently)
- Risk of accreta is 5% with unscarred uterus
- Previous C-section and previa portends a 25% risk of accreta

# Clinical Findings - Previa (1)

- Most common symptom is painless bleeding
- Some degree of placental separation is inevitable with previa = bleeding
- Bleeding increases with labor, direct trauma, or digital examination

## Clinical Findings - Previa (2)

- Initial bleeding is usually not catastrophic
- Uterine bleeding may persist postpartum because of overdistention of the poorly contractile lower uterine segment
- Coagulopathy is uncommon with previa unless due to massive bleeding



# Overdistended Lower Uterine Segment - Previa



# Placenta Previa - Diagnosis

- DO NOT DIAGNOSE via vaginal exam!  
(Exception – “double setup”)
- Ultrasound is the easiest, most reliable way to diagnose (95%-98+% accuracy)
- False positive - ultrasound with distended bladder
- Transvaginal or transperineal often superior to transabdominal methods

# Placenta Previa – Placental Migration

- Placental location may “change” during pregnancy
- 25% of placentas implant as “low lying” before 20 weeks of pregnancy
- Of those 25%, up to 98% are not classified as placenta previa at term
- Complete or partial previas do not appear to resolve as often (if at all)

# Placenta Previa – Placental Migration (2)

- Clinically important bleeding is not likely before 24-26 weeks gestation
- The clinically important diagnosis of placenta previa is therefore a late second or early third trimester diagnosis
- Migration is a misnomer - the placental attachment does not change, the relative growth of the lower segment does

# Management - Placenta Previa

- The clinical relevance of the diagnosis is in the late second and/or third trimester
- Bedrest probably indicated
- Antenatal testing probably indicated
- Recent data suggests, if environment ideal, home care is acceptable

# Management - Placenta Previa (2)

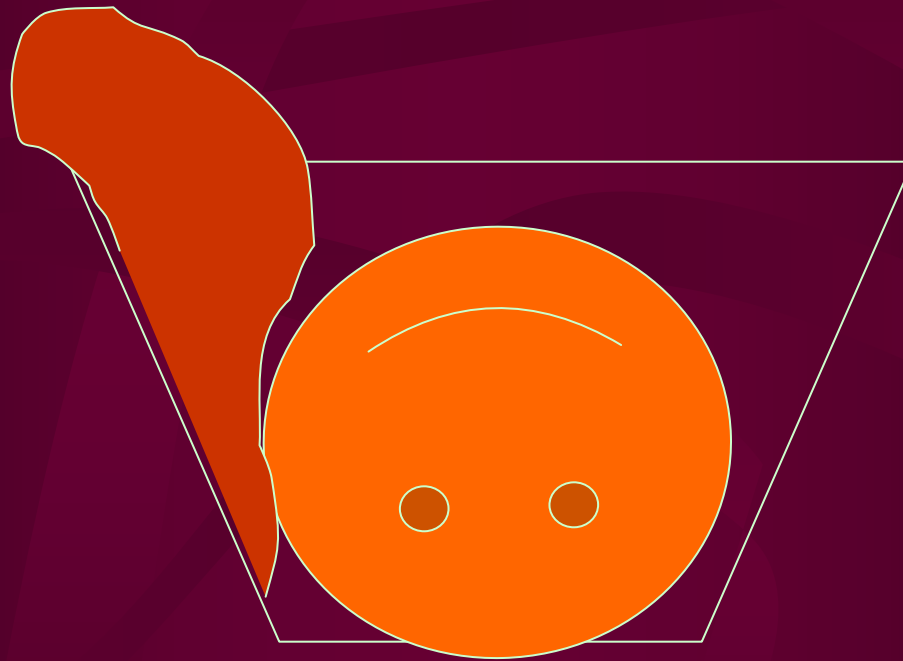
- Evaluation for possibility of accreta needs to be considered
- Consideration for RHIG in Rh-negative patients with bleeding
- Episodic AFS testing with bleeding events
- Vigilance regarding fetal growth
- Follow-up ultrasound if indicated

# Management - Placenta Previa (3)

- Delivery should depend on type of previa
  - Complete previa = c/section
  - Low lying = probable attempted vaginal delivery
  - Marginal/partial = it depends!

Consider “double setup” for uncertain cases

# Tamponade Of Previa By Presenting Part





# Placenta Accreta

- Placenta accreta
  - Accreta = adherent to endometrial cavity
  - Increta = placental tissue invades myometrium
  - Percreta = placental tissue grows through uterine wall

Accreta caused by faulty development  
of NITABUCH'S LAYER

# Placenta Accreta

- Incidence = approximately 1/2500
- Related to abnormal decidual formation
- 1/3 coexisted with placenta previa
- 1/4 with previous curettage
- Grandmultiparity can be risk factor
- If diagnosed microscopically, 1/2 women with C/S have some evidence of abnormal implantation

# Clinical Course - Accreta

- Association with elevated MSAFP
- Antepartum bleeding usually related to coexistent placenta previa
- Main problem is at delivery with adherent placenta
  - Association with inversion
  - Bleeding of placental bed
  - Increta/percreta consequences

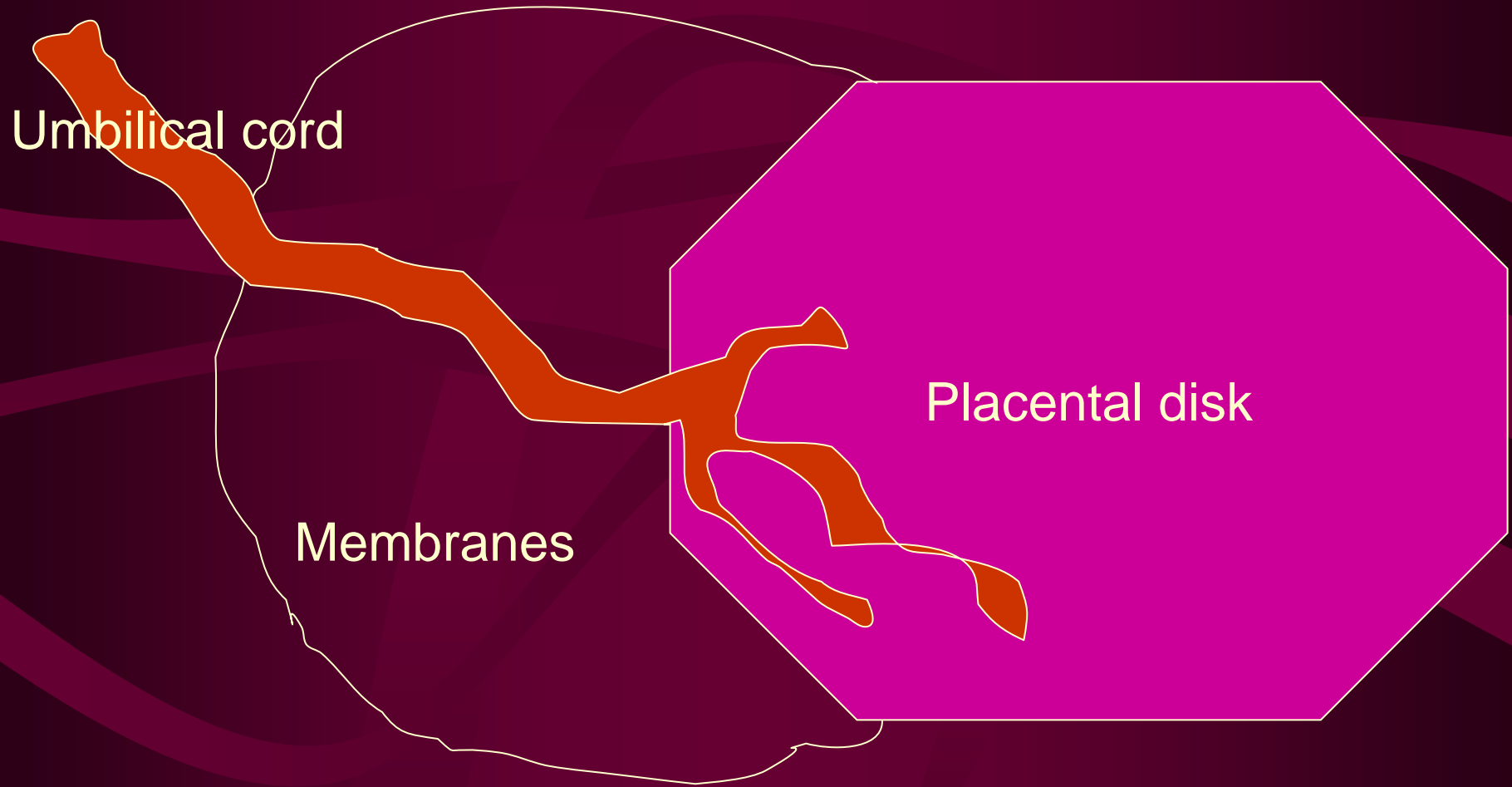
## Clinical Course - Accreta(2)

- Attempted manual removal is often unsuccessful
- Conservative management suggested (albeit with *high* M/M)
- May require radical surgery if invasion is extrauterine

# Vasa Previa

- Associated with velamentous insertion of the umbilical cord (1% of deliveries)
- Bleeding occurs with rupture of the amniotic membranes (the umbilical vessels are only supported by amnion)
- Bleeding is FETAL (not maternal as with placenta previa)
- Fetal death may occur with trivial symptoms

# Vasa Previa



# Abruptio Placentae

- Placental abruption occurs when all or part of the placenta separates from the underlying uterine attachment
- Incidence - approximately 1/100-1/200 deliveries
- Common cause of intrauterine fetal demise

# Abruptio Placentae - Associating Factors

- Hypertension - Half of fatal fetal abruptions were associated with HTN
- PPRM - abruptio may be a manifestation of rapid decompression of uterus or from subacute villitis
- Smoking (and/or ethanol consumption) linked to abruptio



# Abruptio Placentae - Associating Factors (2)

- Cocaine abuse - 2%-15% rate of abruption in patients using cocaine
- Uterine leiomyoma - risk increased if fibroid is behind implantation site
- Trauma - relatively minor trauma can predispose (association with bleeding, contractions, or abnormal FHT)

# Abruptio Placentae - Recurrence

- Recurrence rate may be as high as 1 in 8 pregnancies
- Antenatal testing is indicated (albeit predictive value may be poor - numerous examples of normal testing with subsequent serious or fatal event)

# Abruptio Placentae – Concealed Hemorrhage

- Bleeding from abruption may be all intrauterine - vaginally detected bleeding may be much less than with placenta previa
- DIC occurs as a consequence of hypofibrinogenemia - in chronic abruption, this process may be indolent

# Occult Hemorrhage in Abruptio



# Abruption - Other Complications

- Shock - now thought to be in proportion to blood loss
- Labor - 1/5 initially present with diagnosis of “labor” - abruption may not be immediately apparent
- Ultrasound may not diagnose abruption in up to 14% of cases

# Abruption - Other Complications (2)

- Renal failure - may be pre-renal, due to underlying process (preeclampsia), or due to DIC
- Uteroplacental apoplexy (Couvelaire uterus) - widespread extravasation of blood into the myometrium and serosa

# Abruption Management

- Management is influenced by gestational age and degree of abruptio
- Indicators for delivery -
  - Fetal intolerance
  - DIC
  - Labor

# Abruption Management (2)

- Vaginal delivery is acceptable (and generally preferred with DIC)
- Tocolysis:
  - Betasympathomimetics contraindicated in hemodynamically compromised
  - Magnesium possibly indicated in special circumstances
  - NSAID's contraindicated



# Postpartum Hemorrhage

- Traditional definition =  $>500$  ml blood loss
- Normally seen blood losses:
  - Vaginal delivery - 50%  $>500$  ml
  - C/section - 1000 ml
  - Elective C-hys - 1500 ml
  - Emergent C-hys - 3000 ml

# Postpartum Hemorrhage (2)

- Pregnancy is normally a state of hypervolemia and increased RBC mass
- Blood volume normally increased by 30%-60% (1-2 L)
- Pregnant patients are therefore able to tolerate some degree of blood loss
- *Estimated* blood loss is usually about 1/2 of actual loss!

# Postpartum Hemorrhage (3)

- Early postpartum hemorrhage is within 1<sup>st</sup> 24 hours (also may be referred to as “postpartum hemorrhage”)
- Late postpartum hemorrhage (not addressed in this talk) is less common and occurs *after* the 1<sup>st</sup> 24 hours postpartum

# Postpartum Hemorrhage - Causes

- Genital tract laceration
- Coagulopathy
- Uterine
  - Uterine atony
  - Uterine inversion
  - Uterine rupture
  - Retained POC

# Postpartum Hemorrhage - Genital Tract Laceration

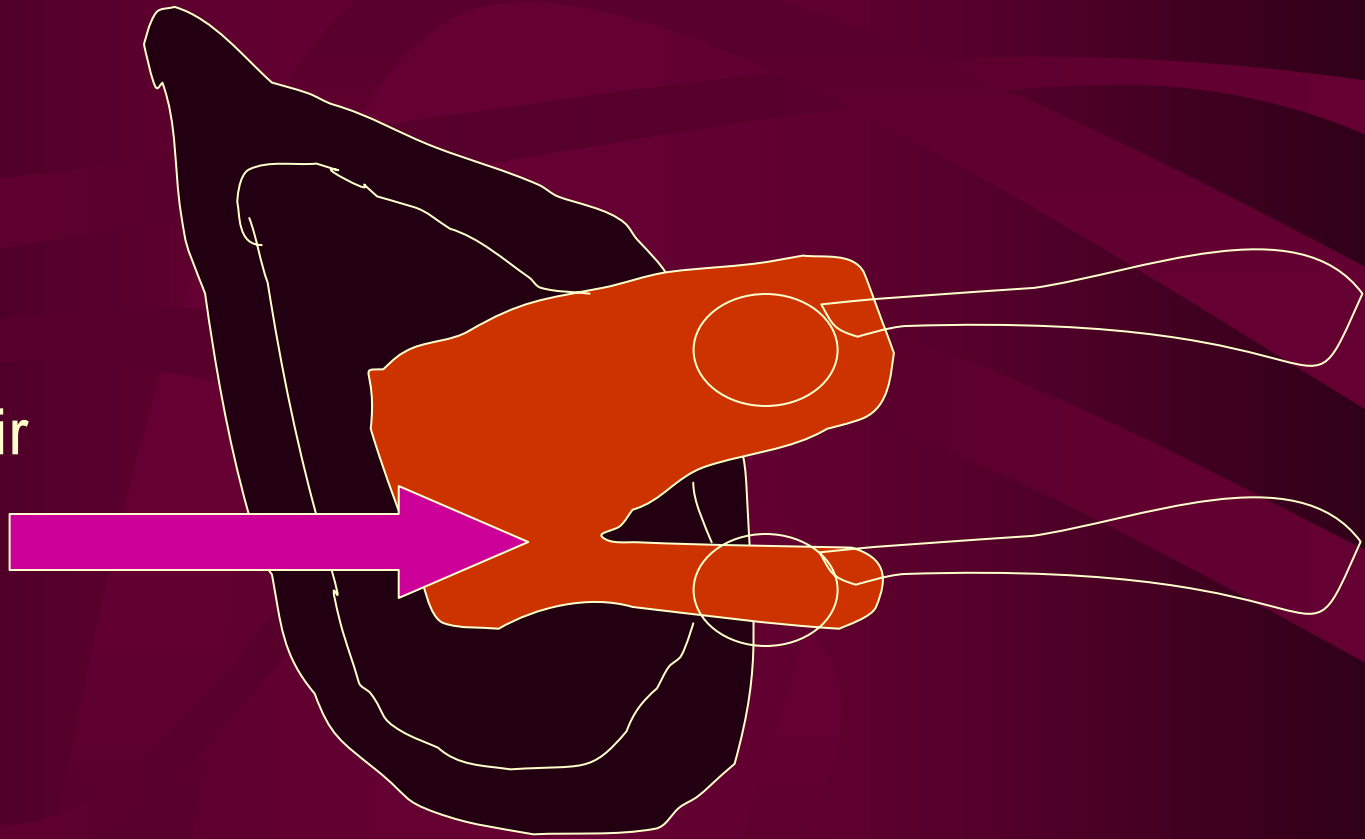
- May be cervix, vaginal sidewall, rectal (example = hemorrhoid), or episiotomy
- Genital tract needs thorough inspection after any delivery
  - Cervix needs to be seen
  - Vagina needs to be inspected

# Repairing Lacerations

- Be sure to suture above internal apex of laceration
- Forceps may be used as vaginal retractors
- Cervical lacerations  $>2.0$  cm in length need to be repaired. The cervix is grasped with ringed forceps and retracted to allow repair (starting at or above apex).

# Cervical Laceration

Begin repair  
at apex



# Puerperal Hematomas

- Incidence = 1/300 to 1/1500 deliveries
- Episiotomy is most commonly associated risk factor
- Considerable bleeding may occur with dissection above pelvic diaphragm
- Drainage usually indicated (source often not evident?)



# Uterine Rupture

- 1%-2% of previous lower segment C/S TOL patients (more with classical C/S)
- Other causes include:
  - Instrumented deliveries/versions/operative
  - Curettage
  - Macrosomia
  - Prolonged labor
  - Oxytocin

## Uterine Rupture (2)

- Rupture = separation of whole scar with rupture of membranes and bleeding
- Dehiscence = partial separation of previous uterine scar that is usually associated with less bleeding
- Dehiscence may be occult

# Uterine Rupture (3)

- Uterine rupture may be associated with antepartum or postpartum events
- Repair may require simple closure or hysterectomy
- Consider uterine rupture in patient with firm uterus (no atony), negative laceration survey, and continued bleeding

# Hemostatic Disorders

- Thrombocytopenia and DIC may predispose to continued vaginal bleeding after delivery
- Occasionally, a patient with von Willebrand's disease (or other inherited disorder) will be diagnosed at or after delivery
- Bleeding from hemostatic disorder is usually not brisk, but it is persistent
- Amniotic fluid embolism may present with DIC

# Uterine Atony

- Most common cause of postpartum hemorrhage
- Should be default diagnosis in patients with postpartum bleeding (albeit always exclude other causes)
- Can be suspected by uterine palpation exam

## Uterine Atony (2)

- A prolonged third stage of labor (>30 min) is associated with postpartum hemorrhage
- Other associations with postpartum hemorrhage include:
  - Enlarged uterus (macrosomia or twins)
  - Prolonged labor or oxytocin (tachyphylaxis)
  - High parity
  - Maneuvers that hasten placental removal

# Uterine Atony Presentation

- Bleeding may be indolent and not easily recognized
- Postpartum patients may not exhibit dramatic hemodynamic changes until blood loss is pronounced
- Patients with pregnancy induced hypertension may fare poorly (MgSO<sub>4</sub>+ volume contraction)

# Uterine Atony Treatment

- Make sure uterus is evacuated (manual exploration)
- Rule out other causes
- Resuscitation
- Uterine contractile agents
  - Oxytocin
  - Ergonovine
  - Prostaglandin



# Uterine Inversion

- May occur spontaneously, as a consequence of placental removal, or in association with connective tissue disorder (Marfan's, Ehlers-Danlos)
- Risk of inversion increased with higher parity
- May occur with accreta

## Uterine Inversion (2)

- Treatment is to reduce inversion before contraction of uterus
- If accreta-associated, **DO NOT REMOVE THE PLACENTA (BLEEDING)**
- May require uterine relaxants (TNG, halothane)
- Rarely, surgical reduction necessary (with constriction band)

# Postpartum Hemorrhage - Unified Approach

- Always examine systematically
- Uterine atony most common, but other causes may be overlooked
- Get help!
- Remember the hemodynamic implications of the bleeding

# Postpartum Hemorrhage

Hemorrhage suspected



Exploration of uterus



Retained placenta  
(Accreta?)



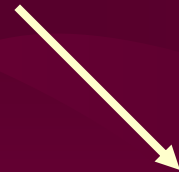
Empty uterus  
(Next Slide)

# Postpartum Hemorrhage (2)

Empty Uterus



Oxytocin  
Atony?



Yes - Secondary medical tx.  
Consider surgery for failure

No - Inspect vagina  
and cervix (next slide)

# Postpartum Hemorrhage (3)

