Overview

Vaginal bleeding is common in pregnancy and is typically from a maternal source. Provisional diagnoses can be made based upon the gestational age and character of bleeding, combined with biochemical testing and imaging.

Definitions

- First Trimester Bleeding: vaginal bleeding within the first twelve weeks GA
- Second Trimester Bleeding: vaginal bleeding between 13-28 weeks GA
- Antepartum Hemorrhage: vaginal bleeding at or after 20 weeks GA

Approach to the patient with bleeding in T1

Differential Diagnosis

- Implantation of pregnancy
- Spontaneous abortion → threatened, inevitable, complete, incomplete
- Ectopic pregnancy

History

- Risk factors for an ectopic
- Previous spontaneous abortion (SA)
- Recent trauma
- Characteristics of the bleeding (including any tissue passed)
- Characteristics of the pain (cramping pain suggests SA)
- History of coagulopathy
- Gynecological/obstetric history
- Dizziness (significant blood loss, may be associated with ruptured ectopic)
- Fever (may be associated with septic abortion)

Physical

- Vitals (including orthostatic changes, temp)
- Abdomen (SFH, tenderness, presence of contractions)
- Perineum (signs of trauma, genital lesions)
- Speculum exam (cervical os open or closed, presence of active bleeding/clots/tissue)
- Pelvic exam (uterine size, adnexal mass, uterine/adnexal tenderness)

Investigations

- beta-hCG (lower than expected for GA in SA/ectopic)
- U/S (to confirm intrauterine pregnancy and fetal viability)
- CBC
- Group and screen

Treatment

- IV resuscitation for hemorrhagic shock
- Treat the underlying cause

Spontaneous Abortions

Classifications of Spontaneous Abortions

<table>
<thead>
<tr>
<th>Type</th>
<th>Clinical</th>
<th>Management in clinically stable patient (+ Rhogam™)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threatened</td>
<td>Vaginal bleeding + cramping</td>
<td>Watch and wait</td>
</tr>
<tr>
<td></td>
<td>Cervix closed and soft</td>
<td>50% go on to abort</td>
</tr>
<tr>
<td></td>
<td>U/S shows viable fetus</td>
<td></td>
</tr>
<tr>
<td>Inevitable</td>
<td>Worsening bleeding, cramping</td>
<td>Wait and wait</td>
</tr>
<tr>
<td></td>
<td>Cervix closed until products start to expel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Following this, external os opens</td>
<td></td>
</tr>
<tr>
<td>Incomplete</td>
<td>Extremely heavy bleeding and cramping + passage of tissues</td>
<td>Wait and wait</td>
</tr>
<tr>
<td>Complete</td>
<td>Bleeding, cramping, and complete passage of sac and placenta</td>
<td>No D&amp;C</td>
</tr>
<tr>
<td></td>
<td>Cervix open</td>
<td>Expectant management, no therapy required</td>
</tr>
<tr>
<td>Missed</td>
<td>Asymptomatic (fetal death in utero)</td>
<td>Wait and wait</td>
</tr>
<tr>
<td></td>
<td>Cervix closed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>U/S may show SGA</td>
<td></td>
</tr>
<tr>
<td>Recurrent</td>
<td>3+ consecutive spontaneous abortions</td>
<td>Evaluate mechanical, genetic, environmental causes</td>
</tr>
<tr>
<td>Septic</td>
<td>Contents of uterus infected, fever, pelvic pain</td>
<td>D&amp;C should be managed in ED</td>
</tr>
</tbody>
</table>

Dr. Michael Evans developed the One-Pager concept to provide clinicians with useful clinical information on primary care topics.
Management of Spontaneous Abortions

- Always rule out an ectopic
- Always check Rh status before D&C
- 50 mcg Rhogam should be given within 72 hrs of threatened or complete abortion if mother Rh-
- Always ensure patient is hemodynamically stable

Ectopic Pregnancy

Definition: embryo implants outside of the endometrial cavity

- 1/100 pregnancies
- Fourth leading cause of maternal mortality, leading cause of death in first trimester
- Increase in incidence over the last 3 decades

Risk Factors

- <50% of patients have no risk factors
- Demographics:
  - older women, African descent
- Smoking
- Prior ectopic pregnancy
- Structural
  - Uterine leiomyomas
  - Adhesions
  - Abnormal uterine anatomy (e.g. T
    shaped uterus)
- Gynecologic:
  - Endometriosis
  - IUD use – although decreased pregnancy
    rate, if pregnancy occurs there is
    increased risk of ectopic
  - history of PID (especially infection with
    C. trachomatis), salpingitis
  - Infertility
  - Use of clomiphene citrate (for induction
    of ovulation)
- Previous procedures:
  - Any surgery on fallopian tube (for
    previous ectopic, tubal ligation, etc.)
  - Abdominal surgery for ruptured
    appendix, etc.
  - IVF pregnancies following ovulation
    induction (7% ectopic rate)

Clinical Features

Vaginal bleeding is common in pregnancy and is typically from a maternal source. Provisional diagnoses can be made based upon the gestational age and character of bleeding, combined with biochemical testing and imaging.

Investigations

- Serial beta-hCG levels; normal doubling time with intrauterine pregnancy is 1.6-2.4 days in early pregnancy
  - Rise of <20% of beta-hCG is 100% predictive of a nonviable pregnancy
  - Prolonged doubling time, plateau or decreasing levels before 8 weeks implies nonviable gestation but does not provide information on location of implantation
- Ultrasound
  - U/S is only definite if fetal cardiac activity is detected in the tube or uterus
  - Intrauterine sac should be visible when serum beta-hCG is
    - >1500 mIU/mL (transvaginal)
    - >6000 mIU/mL or 6 weeks gestational age (transabdominal)
    - → Specific finding on transvaginal U/S is a tubal ring
  - Culdocentesis (rarely done)
  - Laparoscopy (for definitive diagnosis)

Management

- If vital signs unstable → immediate surgery
- If vitals stable
  - AND <3.5cm un-ruptured ectopic
  - AND no FHR
  - AND beta < 5000
  - AND no hepatic/renal/hematologic disease
  - AND compliance assured/able & willing to follow up
    - → Methotrexate
- If vitals stable AND:
  - > 3.5cm un-ruptured ectopic
  - OR FHR
  - OR beta > 5000
  - OR no hepatic/renal/hematologic disease
  - OR poor compliance, unable to follow up
    - Consider surgical management or Methotrexate with more frequent follow-up

Approach to the patient with bleeding in T2

Differential Diagnosis:

- Miscarriage
- Cervical/uterine/vaginal pathology
- Cervical insufficiency
- Abruptio Placentae
- Ectopic pregnancy

> The approach to bleeding in the second trimester BEFORE 20 weeks is approached similarly to bleeding in T1

Antepartum Hemorrhage

Definition → vaginal bleeding from 20 weeks to term

Differential Diagnosis:

- Bloody show (shedding of cervical mucous plug) → most common etiology in T3
- Placenta previa
- Placental abruption → most common pathological etiology in T3
- Vasa previa
- Marginal sinus bleeding
- Cervical lesion (cervicitis, polyp, ectropion, cervical cancer)
- Uterine rupture
- Other: bleeding from bowel or bladder, placenta accreta, abnormal coagulation
<table>
<thead>
<tr>
<th>Definition</th>
<th>Placenta previa&lt;sup&gt;11,12&lt;/sup&gt;</th>
<th>Placental abruption&lt;sup&gt;13,14&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abnormal location of the placenta near, partially or completely over the cervical os</td>
<td>Premature separation of a normally implanted placenta after 20 weeks gestation</td>
<td></td>
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</tbody>
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<table>
<thead>
<tr>
<th>Etiology</th>
<th>Idiopathic</th>
<th>Most are idiopathic</th>
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<table>
<thead>
<tr>
<th>Epidemiology</th>
<th>Incidence = 0.5-0.8% of all pregnancies</th>
<th>Incidence: 1-2% of all pregnancies</th>
</tr>
</thead>
</table>

| Risk Factors | Placenta previa: History of placenta previa (4-8% recurrence risk), Multiparity, Advanced maternal age >35 years, Smoking and cocaine use in pregnancy, Multiple gestation, Uterine tumour (e.g., fibroids) or other uterine anomalies, Uterine scar due to previous abortion, C/S, D&C, myomectomy | Placental abruption: Previous abruption (recurrence rate 5-16%), Maternal hypertension (chronic or PIH in 50% of abruptions) or vascular disease, Cigarette smoking (>1 ppd), excessive alcohol consumption, cocaine, Multiparity and/or maternal age >35 (felt to reflect parity), PPROM, Rapid decompression of a distended uterus (polyhydramnios, multiple gestation), Uterine anomaly, fibroids, Trauma (e.g., motor vehicle collision, maternal battery), Iron deficiency, Inherited thrombophilia, Multiple gestation |

<table>
<thead>
<tr>
<th>Clinical Features</th>
<th>Classification</th>
<th>Classification</th>
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<tbody>
<tr>
<td><strong>Classification</strong></td>
<td>Total: placenta completely covers the internal os</td>
<td>Total (fetal death inevitable) vs. partial</td>
</tr>
<tr>
<td></td>
<td>Partial: placenta partially covers the internal os</td>
<td>External/revealed/apparent: blood dissects downward toward cervix</td>
</tr>
<tr>
<td></td>
<td>Marginal: within 2 cm of os but does not cover any part of os – causes potential risk of hemorrhage during cervical effacement and dilatation</td>
<td>Internal/concealed (20%): blood dissects upward toward fetus</td>
</tr>
<tr>
<td></td>
<td>Low lying (NOT a previa): placenta in lower segment but clear of os (can also bleed, but usually in labour) distance of leading edge 2-3 cm from internal os, not significant increased risk of bleeding</td>
<td>o Most are mixed</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>History</th>
<th>PAINLESS: bright red vaginal bleeding (recurrent), may be minimized and cease spontaneously, but can become catastrophic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean onset of bleeding is 30 wks GA, but onset depends on degree of previa (complete bleed earlier, marginal bleed at onset of labour)</td>
<td>PAINFUL: vaginal bleeding, uterine tenderness, uterine contractions</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Physical exam</th>
<th>Uterus soft and non-tender, presenting part high or displaced</th>
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</thead>
<tbody>
<tr>
<td>Do NOT perform a vaginal exam until placenta previa has been ruled out by U/S</td>
<td></td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Complications</th>
<th>Fetal: Perinatal mortality low but still higher than with a normal pregnancy, Prematurity (bleeding often dictates early C/S), Intrauterine hypoxia (acute or IUGR), Fetal malpresentation, PPROM, Risk of fetal blood loss from placenta, especially if Incised during C/S, Maternal, &lt;1% maternal mortality, Hemorrhage and hypovolemic shock, anemia, acute renal failure, pituitary necrosis (Sheehan syndrome), Placenta accreta – especially in previous uterine surgery; anterior placenta previa, Hysterectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal</td>
<td>DIC (in 20% of abruptions)</td>
</tr>
<tr>
<td></td>
<td>Placental abruption is the most common cause of DIC in pregnancy</td>
</tr>
<tr>
<td></td>
<td>Acute renal failure</td>
</tr>
<tr>
<td></td>
<td>Anemia</td>
</tr>
<tr>
<td></td>
<td>Hemorrhagic shock</td>
</tr>
<tr>
<td></td>
<td>Pituitary necrosis (Sheehan syndrome)</td>
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<td></td>
<td>Amniotic fluid embolus</td>
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<table>
<thead>
<tr>
<th>Investigations</th>
<th>Ultrasound diagnosis (transabdominal ultrasound has 95% accuracy)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Due to development of lower uterine segment, 90-95% of previas diagnosed in T2 resolve by T3</td>
</tr>
<tr>
<td></td>
<td>o repeat U/S at 30-32 weeks for partial or total previas; repeat U/S for low-lying not indicated unless recurrent bleeding</td>
</tr>
</tbody>
</table>

| Investigations | Clinical diagnosis- u/s not sensitive for abruption |
### Management

Goal: keep pregnancy intrauterine until the risk of delivery < risk of not delivering
Stabilize and monitor
- Maternal stabilization: large bore IV with hydration; O2 for hypotensive patients
- Maternal monitoring: vitals, urine output, blood loss, bloodwork (hematocrit, CBC, INR/PTT, platelets, fibrinogen, FDP, type and cross match)
- Electronic fetal monitoring
- U/S assessment: when fetal and maternal condition permit, determine fetal viability, gestational age and placental status/position
  - Rhogam™ if mother is Rh negative
  - Kleihauer-Betke test to determine extent of fetomaternal transfusion so that appropriate dose of Rhogam can be given

RA <37 weeks and minimal bleeding – expectant management
- Admit to hospital
- Limited physical activity, no douches, enemas, or sexual intercourse
- Consider corticosteroids for fetal lung maturity
- Delivery when fetus is mature or hemorrhage dictates

GA >36 weeks, profuse bleeding or L/S ratio is >2:1 – deliver by C/S
- Maternal stabilization: large bore IV with hydration; O2 for hypotensive patients
- Electronic fetal monitoring
- Maternal monitoring: vitals, urine output, blood loss, bloodwork (hematocrit, CBC, INR/PTT, platelets, fibrinogen, FDP, type and cross match)
- Blood products on hand (red cells, platelets, cryoprecipitate) because of DIC risk
- Rhogam™ if Rh negative
- Kleihauer-Betke test may confirm abruption
- Mild Abruption (abruption with no fetal compromise)
  - GA <36 weeks: use serial Hct to assess concealed bleeding, deliver when fetus is mature or hemorrhage dictates
  - GA >36 weeks: stabilize and deliver
- Moderate (abruption with fetal compromise) to Severe (abruption with fetal death)- consider DIC Abruption
  - Hydrate and restore blood loss and correct coagulation defect if present
  - Vaginal delivery if no evidence of fetalm or maternal distress and if cephalic presentation OR with dead fetus
  - C/S if live fetus and fetal or maternal distress develops with fluid/blood replacement, labour fails to progress or non-cephalic fetal presentation

### Differentiating Placenta previa & Placental abruption

<table>
<thead>
<tr>
<th>Placenta Previa</th>
<th>Placental Abruption</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAINLESS</td>
<td>Abdominal PAIN and/or backache</td>
</tr>
<tr>
<td>NO tenderness</td>
<td>Uterine TENDERNESS</td>
</tr>
<tr>
<td>Uterus SOFT</td>
<td>INCREASED uterine tone</td>
</tr>
<tr>
<td>No uterine irritability/contractions</td>
<td>Uterine IRRITABILITY/CONTRACTIONS</td>
</tr>
<tr>
<td>Malpresentation and/or high presenting part</td>
<td>Usually NORMAL fetal presentation</td>
</tr>
<tr>
<td>Fetal heart usually NORMAL</td>
<td>FHR may be ABSENT or Non-reassuring</td>
</tr>
<tr>
<td>Shock and anemia CORRESPOND to apparent blood loss</td>
<td>Shock and anemia OUT OF PROPORTION to blood loss</td>
</tr>
<tr>
<td>Coagulopathy very UNCOMMON initially</td>
<td>May have COAGULOPATHY</td>
</tr>
</tbody>
</table>

### Vasa Previa

**Definition**
- Unprotected fetal vessels pass over the cervical os; associated with velamentous insertion of cord into membranes of placenta or succenturiate lobe

**Epidemiology**
- 1 in 5,000 deliveries – higher in twin pregnancies

**Clinical Features**
- PAINLESS vaginal bleeding and fetal distress (tachy- to bradyarrhythmia)
- 50% perinatal mortality, increasing to 75% if membranes rupture (most infants die of exsanguination)

**Investigations**
- Apt test (NaOH mixed with the blood) can be done immediately to determine if the source of the bleeding is fetal (supernatant turns pink) or maternal (supernatant turns yellow)
- Wright stain on blood smear and look for nucleated red blood cells (in cord, not maternal blood)

**Management**
- Emergency C/S (since bleeding is from fetus, a small amount of blood loss can have catastrophic consequences)

References can be found online at [http://www.dfcm.utoronto.ca/programs/postgraduateprograme/One_Pager_Project_References.htm](http://www.dfcm.utoronto.ca/programs/postgraduateprograme/One_Pager_Project_References.htm)