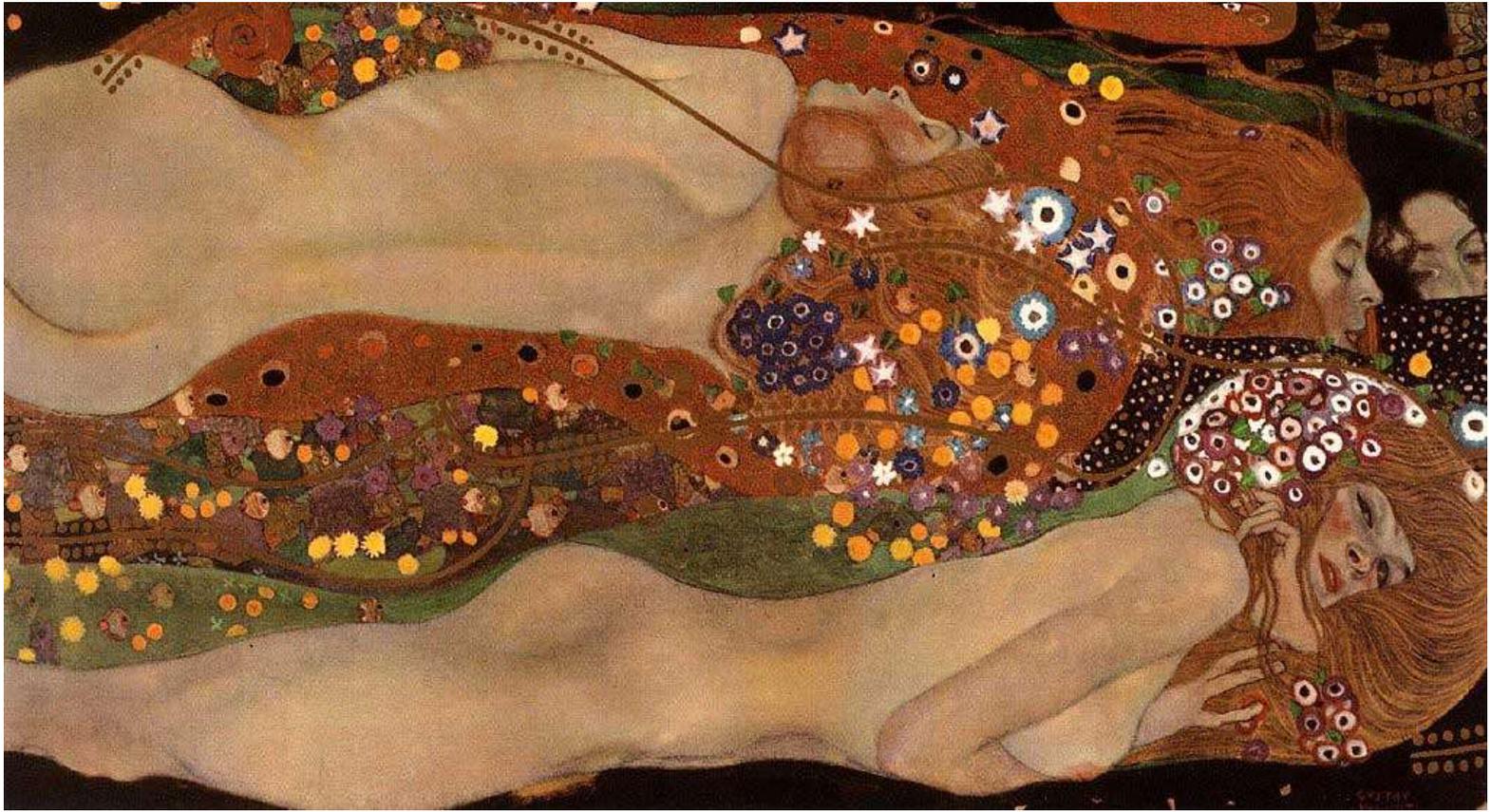


**ANTEPARTUM HAEMORRHAGE**



*Water Serpents II, Water Serpents I, tempera, watercolour, gold and silver leaf. 1904-07  
Gustave Klimt.*

*In June 1902, the great French sculptor Auguste Rodin was passing through Vienna, en route from Prague. While in town, he accepted an invitation to visit the current exhibition of the Vienna Secession movement, and to meet the artist whose monumental work, the Beethoven Frieze, was at the heart of the display: Gustav Klimt. The two artists - Rodin 62, and at the peak of his fame, Klimt just about to turn 40 - went to a café in the Prater garden. According to the art critic, Berta Zuckerkanndl, they sat down "beside two remarkably beautiful young women" at whom Rodin gazed enchantedly. "That afternoon, two slim and lovely vamps came buzzing around Klimt and Rodin, those two fiery lovers",*

*Zuckerkanndl recalled. "Rodin leaned over to Klimt and said, "I have never before experienced such an atmosphere - your tragic and magnificent Beethoven fresco, your unforgettable, temple-like exhibition, and now this garden, these women, this music. What is the reason for it all?" And Klimt slowly nodded his beautiful head, and answered only one word; "Austria".*

*"Gustav Klimt: a life devoted to women",  
Martin Gayford, The Telegraph, May 2008.*

*The Undines were primal female water beings that inhabited rivers and lakes and forest pools. The group contained many sub-species, including the nereides, naiades, sirens, sprites, mermaids and the kelpies of Celtic mythology. They featured especially in Ovid's Metamorphosis as water nymphs in the First Century A.D, and in the alchemical writings of Paracelsus in the Sixteenth century. The exact nature of these beings was uncertain, they were not like mortal humans, yet they were not quite immortal goddesses either - more like spirits of nature. To acquire full immortality they required the soul of a mortal man, and so they took on the sinister role of the original "femme fatale". They would enchant men and then lure them to their watery graves, steal their souls and thus become immortal like the gods. The undine is an ancient, recurring and powerful leitmotif, of literature, legend, sculpture and the visual Arts. Perhaps its most refined and beautiful expression was achieved in the age of Austrian Art Nouveau, by the Viennese secessionist, Gustav Klimt. The image of the Undine was perfectly suited to Art Nouveau, and to Klimt, who loved women with an uncontrolled passion. The waves of a woman's hair and the curves of their bodies provided infinite metaphor for the flowing waters of the forest streams and rivers. In Klimt's series on "Water Serpents" we see his image of the alluring femme fatale in the form of the organic flowing and branching lines of Art Nouveau. Klimt by combining mythology and metaphor and presenting it in acceptable beautiful and visually stunning modern ways was able to present in his works, themes that polite society had previously hidden away and held as strictly taboo - female sexuality. In the age of Sigmund Freud, this was one of Klimt's greatest contributions to Austrian culture at the dawn of the Nineteenth century.*

*When we assess a woman for PPH we need remember the ancient stories on the Undine. In the case of an abruption the true danger may be largely concealed!*

## ANTEPARTUM HAEMORRHAGE

### Introduction

**Antepartum haemorrhage (APH) is defined as any bleeding from the genital tract after the 20th week of pregnancy and before the onset of labour.**

Some of the causes of antepartum haemorrhage might also cause intrapartum bleeding, such as an abruption or placenta praevia.

There are four principal causes:

1. Placenta Praevia
2. Placental abruption
3. Vasa Praevia
4. Cervical and lower genital tract bleeding

**Bleeding can range from mild to massive where it constitutes a medical emergency.**

### Classification of APH

APH is classically divided into 4 principle groups:

1. **Placenta Praevia** (about 30% of APH cases):
  - This it is bleeding from a placenta when the placenta is inserted wholly or partly into the lower segment of the uterus in the third trimester of pregnancy.
  - As the placenta occupies the lower uterine segment, the presenting part may be high or the foetus may be a mal-presented, due to restricted descent into the pelvis.
2. **Placental abruption** (about 25% of APH cases):
  - The premature separation of a normally situated placenta from the uterine wall that occurs before delivery of the foetus.
3. **Vasa Praevia** (a rare condition):
  - Here umbilical blood vessels traverse the foetal membranes of the lower uterine segment above the cervix., unsupported by the umbilical cord or the placenta.
  - Bleeding from these vessels is almost always associated with rupture of the foetal membranes.

4. **Cervical and lower genital tract bleeding** (about 45% of APH cases):

- This includes bleeding from the cervix or vagina.

**Pathophysiology**

**Placenta Praevia**

This is bleeding from separation of an abnormally placed placenta

Placenta praevia generally is defined as the implantation of the placenta over or near the internal os of the cervix.

From the second trimester, a placenta praevia may be also associated with vasa praevia (see below).

**Classification:**

Traditionally placenta praevia was classified into 4 types:

- Type 1: The placenta is in the lower segment but does not reach the internal os.
- Type 2: The placenta reaches the margin of the internal os.
- Type 3: The placenta partially covers the internal os.
- Type 4: The placenta completely covers the internal os

Placenta praevia is now more commonly classified as simply **major** or **minor**:

- **Minor placenta praevia** (Type I &II):
  - ♥ Placenta not lying over the cervical os but encroaching on the lower uterine segment.
- **Major placenta praevia** (Type III &IV):
  - ♥ Placenta lying over the cervical os.

Additionally placenta praevia can be classified according to the degree of placental **adherence to the uterus**:

- **Placenta accreta** (superficial)
- **Placenta increta** (into muscle)
- **Placenta percreta** (through muscle).

### Risk factors:

1. A low lying placenta occurs in 5% of pregnancies at 16 - 18 weeks gestation but are evident in only 0.5% pregnancies at term.

The change of placental position results from the formation of the lower uterine segment and which moves the placenta upwards with the expanding uterus.

2. The incidence of placenta praevia is higher in women with a previous caesarean section and increases in prevalence with each caesarean section.

### Complications:

1. Haemorrhaging
2. Foetal effects:

The foetal effects of placenta praevia, that are seen in the longer term, may include:

- Intrauterine growth restriction (IUGR), due to abnormal placental implantation and vascularisation in the area of the uterus destined to be the lower segment
- A higher incidence of premature pre-labour rupture of the membranes (PPROM), which is thought to be as a result of the blood affecting the integrity of the membranes.

### Placental abruption

Abruptio is an antepartum haemorrhage due to the premature separation of a normally situated placenta from the myometrial wall that occurs before delivery of the foetus.

The exact aetiology is unknown, but the final pathophysiology is likely rupture of a spiral artery with haemorrhage into the decidua basalis leading to separation of the placenta. The small vessel disease seen in abruptio placentae may also result in placental infarction.

Placental abruption is associated with a high maternal and neonatal morbidity and mortality.

### Classification:

Placental abruption can be classified in a number of ways:

#### **Revealed verses concealed:**

The bleeding may be may be:

1. Revealed:
  - When blood escapes through the vagina
2. Concealed:
  - When the bleeding occurs behind the placenta, with no evidence of bleeding from the vagina.

**Note that when there is revealed bleeding it is also likely that there is a significant concealed proportion of bleeding as well.**

### **Degree of separation:**

Abruption may also be classified according the *degree of separation* that occurs, usually as class I, II, III, or IV.

The increasing degree of abruption will correlate with increasing signs of maternal and foetal compromise and biochemical abnormalities.

### **Position of the abruption:**

According to the position of the abruption within the placenta it can be classified as:

- Marginal placental abruption: most common by far
- Retro-placental abruption
- Pre-placental abruption

### **Risk factors:**

Risk factors for placental abruption include:

1. Trauma e.g. motor vehicle accident:
  - This is a major risk factor
  - A woman involved in trauma, such as an MVA, should be evaluated for abruption.

An abruption may occur in the absence of direct abdominal trauma or, an abruption may become apparent several hours or days after the trauma.
2. Chronic hypertension
3. Preeclampsia
4. Thrombophilia

5. Previous placental abruption
6. Smoking
7. Drug abuse: in particular cocaine abuse.
8. Chorioamnionitis
9. Sudden reduction in size of an over-distended uterus:
  - e.g. rupture of the membranes in association with polyhydramnios, or between births of multiple pregnancies.

### Complications:

The complications of placental abruption include:

1. Maternal shock.
2. Foetal distress and death.
3. Coagulopathies, in particular DIC, is a major complication in abruptions.
4. Renal failure (shock and microthrombosis).
5. Postpartum haemorrhage is also relatively common following a placental abruption and may occur as a consequence of both a bleeding disorder (thrombocytopenia / DIC) and uterine atony.

### Vasa Praevia

Vasa praevia is a condition in which the umbilical vessels, unsupported by either the umbilical cord or placental tissue, traverse the foetal membranes of the lower segment above the cervix.

### Classification:

Vasa praevia can be of two types: <sup>3</sup>

**Type I** (present in about 90% of cases with vasa praevia):

- Abnormal foetal vessels connect a velamentous cord insertion with the main body of the placenta

**Type II** (present in about 10% of cases with vasa praevia):

- Abnormal vessels connect portions of a bilobed placenta.

- Placenta with a succenturiate lobe.

Due to this association, vasa previa needs to be excluded in patients with variant placental morphology

#### Risk factors:

Risk factors for vasa praevia include:

1. Placenta praevia
2. Low lying placenta
3. Bilobate placenta.
4. Succenturiate placenta.

#### Complications:

Bleeding may result from the rupture of these vessels usually during rupture of the membranes.

#### Cervical and lower genital tract bleeding

Causes can include

- Cervical ectropion
- Carcinoma.
- Cervicitis/ infection
- Polyps
- Vulval varices
- Trauma

#### Clinical features

##### Placenta Praevia

Women with a placenta praevia generally present in one of the following ways:

- With an antepartum haemorrhage.
- As a finding on ultrasound in an asymptomatic woman.
- With a foetal malpresentation or a high mobile presenting part in late pregnancy.

- With vaginal bleeding in labour

The clinical features of an **APH** due to placenta praevia include:

1. **Painless** bleeding:

- Bleeding is more likely to occur in the third trimester when the lower uterine segment is developing or during contractions with cervical dilatation, which is thought to cause shearing forces, leading to disruption of the placental attachment.
- **Bleeding can also be provoked by a digital examination or by intercourse.**

**Vaginal examination should be done with a *speculum only*, to assess the site of bleeding.**

2. Bleeding can be **recurrent** (and often progressively worse):

- The most common pregnancy complication arising from a placenta praevia is *intermittent* vaginal bleeding.
- About 70 - 80 % of women with a placenta praevia will have at least one episode of vaginal bleeding, irrespective of whether the placenta praevia is major or minor.
- Intermittent bleeding may also lead to maternal anaemia and so it is worthwhile ensuring and maintaining adequate maternal haemoglobin levels and iron stores.

3. Blood loss is largely “**revealed**”

4. Blood tends to be “bright”

5. Usually no abdominal tenderness

6. Presenting part is high and mobile

*Placental abruption*

The clinical features of an **APH** due to placental abruption include:

1. **Painful** bleeding:

- This is in contrast to the *painless* bleeding of placenta praevia or bleeding from the cervix or lower genital tract.

- Abruptio should be high on the differential diagnosis list whenever abdominal pain occurs in the second half of pregnancy.

**Back pain** may also be another common symptom.

2. Blood tends to be “dark”
3. Abdominal / back tenderness:
  - Where the abruptio is *substantive*, the uterus may be tender on palpation or may feel hard or tense.
4. Blood loss may be largely “**concealed**”.
  - The absence of vaginal bleeding therefore does not rule out an abruptio.
  - Note that when there **is** revealed vaginal bleeding it is also likely that there is a significant concealed proportion of bleeding as well.
5. Fundus may be higher than expected for dates
6. Uterine activity:
  - Uterine contractions are a common finding with placental abruptio.  
  
This is a sensitive marker of abruptio and, in the absence of vaginal bleeding, should raise the suggestion of an abruptio, especially following some form of **trauma** or in a patient with multiple risk factors.
  - Symptoms, signs and clinical examination findings of **preterm labour** may also coexist with abruptio.
7. Foetal demise:
  - In some cases foetal demise may be the only indication that an abruptio has occurred.

### Vasa Praevia

Vasa praevia will only rarely present as an antepartum haemorrhage.

Detection is more likely:

- On vaginal examination with palpation of foetal vessel
- Vaginal bleeding at amniotomy
- Sudden severe abnormalities of the foetal heart rate in labour.

### Cervical and lower genital tract bleeding

In these cases bleeding is usually:

- Revealed
- Painless

Bleeding associated with the onset of labour (i.e. “show”) is not traditionally considered an Antepartum Haemorrhage.

If the cervix is effaced or a dilated cervix and other causes of bleeding are excluded, the bleed is likely to be a “show”.

Cervical ectropion / dysplasia:

- Bleeding from the surface of the cervix caused by contact with the speculum and may indicate cervical pathology and warrant further investigation i.e. pap smear/colposcopy.

Vaginitis:

- Bleeding from the walls of the vagina may indicate a severe vaginitis.

Genital Tract Polyps:

- Cervical polyps are usually apparent upon speculum examination.

Vulval or vaginal varices:

- These will be apparent upon speculum examination.

Trauma:

- Consider victims of domestic violence and sexual assault.

### Investigations

#### Blood tests:

1. FBE
2. U&Es/ glucose
3. Coagulation profile.
4. Thrombophilia screen:

- Women who have had a **placental abruption** should be screened for both congenital and acquired thrombophilias.
5. Blood group and cross match as clinically indicated
  6. Kleihauer test.

### CTG Monitoring:

All cases should have CTG monitoring to assess foetal well-being and maternal contractions.

### Ultrasound:

**An ED US scan can be done as an initial screen for foetal movements and detection of the foetal heart rate.**

### Placenta praevia:

- **Trans-vaginal** or **trans-labial ultrasound** is now the preferred method for localization of a low lying placenta.

They have been shown to be significantly more accurate than using trans-abdominal

Sonography and it is safe to perform, even in the presence of bleeding.

It is easier to identify an anterior than a posteriorly located placenta praevia.

This is because the foetus often obscures the leading edge of a posterior placenta.

### Placental abruption:

- Placental abruption may be appreciated on US, but it is **not** the ideal investigation to diagnose it.

Unless there is *substantive* placental separation, (which in any case will be clinically apparent), a placental abruption is **not** likely to be seen on ultrasound.

### Vasa Praevia:

- When performing a third trimester ultrasound on a woman with a suspected placenta praevia, it is recommended that colour Doppler imaging is also performed specifically to detect the presence of foetal vessels.
- The diagnosis is often made with trans-abdominal Doppler sonography demonstrating flow within vessels which are seen overlying the internal cervical os.

- Occasionally a trans-vaginal scan is required to aid better visualization of aberrant vessels.

### Uterine Rupture:

Reported sonographic signs of uterine rupture include: <sup>3</sup>

- The identification of the protruding portion of the amniotic sac
- An endometrial or myometrial defect
- An extra-uterine haematoma
- Haemoperitoneum or free fluid

### MRI:

MRI is the gold standard to **imaging the placenta and its relationship to the cervix**, although in most instances it is not required.

Sagittal images best demonstrate the relationship of the placenta to the internal cervical os.

**MR imaging** can accurately detect **placental abruption** and should be considered after negative US findings. <sup>3</sup>

Haemorrhage due to abruption appears as an area of medium to high signal intensity on T1 and high signal intensity on T2 weighted image, located between the placenta and uterine wall.

Multiplanar MR imaging offers a comprehensive assessment of the uterine wall and the peritoneal cavity when uterine rupture is suspected.

### Management

1. Attend to any immediate ABC issues of resuscitation:
  - IV access: one or two size 16 gauge or larger bore cannulae.
  - Initial crystalloid fluid resuscitation as required.
  - Give blood and blood products as indicated:
    - ♥ Packed RBCs
    - ♥ FFP
    - ♥ Platelets

♥ Cryoprecipitate

**For severe/life threatening bleeding, O negative blood and activation of a massive transfusion protocol will be required.**

2. Analgesia as required:

Note that the need for analgesia should raise suspicion of:

- A moderate or severe placental abruption

*And/ or*

- That the woman is in labour.

3. **Establish CTG monitoring.**

4. PV examination:

- This is **contraindicated** in APH, (as it may promote significant bleeding in cases of **placenta praevia**).
- Gentle *speculum examination* may be undertaken by the obstetrician under controlled circumstances (e.g. in theatre) to exclude cervical or other lower genital tract bleeding.
- Generally it is best to check the placental site on a previous ultrasound before any vaginal examination is undertaken.

5. Anti D Immunoglobulin:

- If the woman is Rhesus negative.
- Give an initial dose of 625 IU IM
- The Kleihauer test is then used to estimate the exact degree of foeto-maternal haemorrhage and thus the requirement for any additional dosing of Anti-D immunoglobulin.

6. Steroids:

- Corticosteroids are given if the gestation is less than **34 weeks**.
- Give two doses of **betamethasone 11.4mg**, 24 hours apart, if delivery is not planned within the next 12 hours.

7. MgSO<sub>4</sub>:

- The treating obstetrician may consider MgSO<sub>4</sub> for foetal neuroprotection if the gestation is < 30 weeks and imminent delivery is likely.

## 8. **Obstetric Management:**

The subsequent mode and urgency of delivery will then depend on a number of factors including:

- The risk to the mother:
  - ♥ Degree of shock/ coagulopathy.
  - ♥ Co-existent conditions (e.g. preeclampsia).
- The risk to the foetus:
  - ♥ The gestational age
  - ♥ Cardiotocography findings.
- The exact cause.

**The timing of birth must therefore weigh the risks of the maternal condition and prematurity, against those of continuing the pregnancy.**

### *Disposition:*

**All patients with APH must be referred urgently to the Obstetric Unit**

**All cases will require admission.**

In cases of severe haemorrhage, the following will also require early referral:

- Anaesthetics
- Paediatrics
- Haematologist:
  - ♥ If blood component therapy is indicated, advice should also be sought from a haematologist regarding the most appropriate therapy.

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