Placenta Praevia: Causes, Pathophysiology, Diagnosis and Treatment

Placenta praevia refers to a condition wherein the placenta implants over the cervical os.

There can be implantation completely covering the os (total placenta previa), a placental edge partially covering the os (partial placenta praevia), or the placenta approaching the border of the os (marginal placenta previa).

A low-lying placenta implants a half to a third of the uterus distinct from the os in the caudad.

Causes Of Placenta Praevia

Bleeding is thought to occur secondary to the thinning of the lower uterine segment in preparation for the onset of labor.

The placental attachments become disrupted or tear with this thinning process and cervical dilatation.
When this bleeding occurs at the implantation site in the lower uterus, the uterus is unable to contract adequately and stop the flow of blood from the open vessels. This is not an issue with placental implantation in the upper uterus secondary to a larger volume of myometrial tissue able to contract and constrict bleeding vessels.

Other causes of hemorrhage in the setting of placenta previa include a digital examination and sexual intercourse.

Pathophysiology

Placenta praevia is initiated by implantation of the embryo (embryonic plate) in the lower (caudad) uterus. With placental attachment and growth, the cervical os may become covered by the developing placenta. A defective decidual vascularization exists, possibly secondary to inflammatory or atrophic changes.

When an absence of the decidua basalis exists and incomplete development of the fibrinoid layer occurs, the placenta can attach directly to the myometrium (accreta), invade the myometrium (increta), or penetrate the myometrium (percreta). In general, placenta accreta occurs in approximately 1 of 2500 deliveries.

The incidence increases to 10% in women with placenta praevia.

Maternal age and any uterine surgery (including previous cesarean delivery) increase the risk for placenta accreta.

The risk for placenta accreta with placenta praevia increases from 4% for those with no surgeries to 65% for those with a history of multiple cesarean deliveries.

Two of 3 patients with placenta accreta require a cesarean hysterectomy

Clinical Presentation of Placenta praevia

The classic presentation of placenta previa is painless vaginal bleeding.

Painless hemorrhage is often noted near the end of the second trimester or in the third trimester. Occasionally, this hemorrhage stops spontaneously and then recurs with labor.

Physical Examination

Any pregnant patient beyond the first trimester presenting with vaginal bleeding requires a speculum examination followed by ultrasound unless previous documentation confirms no placenta praevia.

Absolutely no digital examination should be performed until placenta praevia is excluded because of the risk of provoking life-threatening hemorrhage.

Uterine activity monitoring reveals that approximately 20% of patients have concurrent contractions with their bleeding.

Differential diagnosis

- Placenta abruption
- Cervicitis
- Premature Rupture of Membranes
- Preterm Labor
- Vaginitis
- Vulvovaginitis

Other Problems to be Considered:

- Vasa Previa
- Cervical laceration
- Vaginal sidewall laceration
- Miscarriage (spontaneous abortion)

Lab Studies:

Although coagulopathy is a rare occurrence, a baseline CBC count with platelets is useful.

Coagulation profile: A disseminated intravascular coagulopathy (DIC) profile with prothrombin time (PT), activated partial thromboplastin time (aPTT), fibrinogen, and fibrin split products (FSP) may also be helpful because retroplacental bleeding has been associated with consumptive coagulopathy.

If the alpha-fetoprotein study result is elevated, the mother may be at increased risk for bleeding and preterm birth.

Imaging Studies:

The most useful and least expensive study is sonography.

While transabdominal sonography has a 95% accuracy, transvaginal sonography provides 100% accuracy in identifying placenta previa.

However, a phenomenon termed placental migration exists in which placenta previa identified early in pregnancy resolves as the pregnancy proceeds. For example, ultrasounds early in the second trimester identify placenta previa in 5-15% of patients, with 90% of these resolving by term. Similarly, 26% of the total cases of placenta praevia and only 2.5% of the cases of partial or marginal placenta previa diagnosed in the second trimester persist into the third trimester.

This does not represent true migration of the implantation site but, rather, differential growth of the placenta and distention of the myometrial cavity away from the os.

MRI is an ideal study for planning the delivery because it allows identification of placenta accreta, placenta increta, and placenta percreta with any placenta praevia.

These rare placental abnormalities carry very high morbidity and mortality rate and may suggest the need for a scheduled cesarean hysterectomy.

Counsel all patients with placenta previa about the possible eventuality of an emergent cesarean hysterectomy.

Other Tests done

Fetal monitoring for reassurance is of primary importance.

Patients who are Rh-negative and unsensitized presenting with painless vaginal bleeding require Rh-immune globulin.

Perform a Kleihauer-Betke test to detect any cases of excessive fetomaternal hemorrhage (>30 mL) that would necessitate additional Rh-immune globulin therapy.

Treatment of placenta praevia

If placenta previa is serendipitously discovered (ie, through an ultrasound ordered for some other reason), continue expectant management until bleeding occurs.

Once bleeding or contractions occur, the patient must quickly return to the hospital for further evaluation.
While classic teaching required admission from the time of the first bleeding episode until delivery, some studies have shown that no difference in maternal or fetal morbidity exists between home management and hospitalization.

The appropriate candidate for home management must be compliant and have accessible transportation, assistance, and sufficient cognitive function to ensure comprehension of instructions.

Preterm labor can manifest as painless vaginal bleeding with placenta previa.

Magnesium sulfate is the tocolytic of choice.

Because of the conflicting information regarding beta-mimetics producing maternal hypotension and tachycardia in the presence of hypovolemia, many clinicians avoid its use.

Be sure to exclude abruption from the differential diagnosis before tocolysis is undertaken; continuous fetal monitoring is required during tocolysis.

If bleeding is minimal and fetal reassurance is noted, consider expectant management to allow for fetal maturity.

For patients who are preterm (24-36 wk), expectant management is the treatment of choice. Volume replacement, blood transfusion (if necessary), and hematocrit maintenance between 30-35% is the goal.

However, if the patient is at term (37 wk) with good dating, perform delivery.

Vaginal delivery may be considered in patients with marginal or partial placenta previa who present in labor with minimal bleeding or in patients with pre-viable gestations or intrauterine fetal demise. In this setting, perform a thorough evaluation of maternal vital signs and a semiquantitative evaluation of blood loss.

If bleeding persists, proceed with an immediate cesarean delivery versus a double setup examination in the operating room.

The double setup with full preparation implies having both pediatric and anesthesia personnel in the operating room and having the patient prepared and draped to proceed with emergent cesarean delivery if necessary. Only consider this option if prompt vaginal delivery is considered to be highly likely.

Surgical management

Cesarean delivery is the safest mode of delivery for patients with complete placenta previa or significant hemodynamic compromise.

If time permits, regional anesthesia is the better alternative because general anesthesia is associated with increased blood loss and the need for blood transfusion.

Most often, the low transverse uterine incision is used; however, a vertical uterine incision may be used when concern about an anterior placenta and fear of fetal bleeding exists.

No medication is of specific benefit to a patient with placenta previa. Tocolysis may be cautiously considered in some circumstances.

Encourage patients with known placenta previa to maintain the intake of iron and folate as a safety margin in the event of bleeding.

Magnesium sulfate

Magnesium sulfate is a tocolytic that is used to prevent preterm labor or contractions.

Magnesium sulfate is also used as a nutritional supplement in hyperalimentation. It is also a cofactor in enzyme systems involved in neurochemical transmission and muscular excitability.

In adults, 60-180 mEq of potassium, 10-30 mEq of magnesium, and 10-40 mEq of phosphate per day may be necessary for an optimum metabolic response.

It is administered intravenously or intramuscularly for seizure prophylaxis in preeclampsia.

Use the IV route for the quicker onset of action in true eclampsia. Discontinue treatment as soon as the desired effect is obtained. Repeat doses are dependent upon the continuing presence of patellar reflex and adequate respiratory function.

It is contraindicat