




Placenta Accreta


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- Placenta accreta spectrum (PAS) is a general term used to describe abnormal trophoblast invasion into the myometrium of the uterine wall.
 - It is clinically important because the placenta does not spontaneously separate at delivery and attempts at manual removal result in hemorrhage, which can be lifethreatening and usually necessitates hysterectomy.
 - The pathogenesis of most cases of PAS is thought to be placental implantation at an area of defective decidualization caused by preexisting damage to the endometrial-myometrial interface.
 - The most important risk factor for PAS is a placenta previa after a prior cesarean delivery.


DEFINITIONS

PAS includes:

- **Placenta accreta** – Anchoring placental villi attach to the myometrium (rather than decidua).
- **Placenta increta** – Anchoring placental villi penetrate into the myometrium.
- **Placenta percreta** – Anchoring placental villi penetrate through the myometrium to the uterine serosa or adjacent organs.

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- Placenta **accreta** is much **more common** than placenta increta and percreta.
 - In the same systematic review, the types and frequencies of abnormal placentation were:
 - **Placenta accreta** – 63 percent
 - **Placenta increta** – 15 percent
 - **Placenta percreta** – 22 percent

- The most common theory is that defective decidualization (thin, poorly formed, partial, absent, or dysfunctional decidua) in an area of scarring caused by previous uterine surgery involving the endometrial-myometrial interface allows the anchoring villi of the placenta to attach directly to or invade the myometrium.
- This theory is supported by the observation that 80 percent of patients with PAS have a history of previous cesarean delivery, curettage, and/or myomectomy.
- Other theories PAS to excessive extravillous trophoblastic invasion or defective maternal vascular remodeling in an area of scarring.

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- In rare cases, uterine pathology, such as bicornuate uterus, adenomyosis, or submucous fibroids, may be associated with microscopic endometrial defects that interfere with normal biological endometrial functions and thereby allow abnormal placental attachment.
 - This may explain the rare occurrence of PAS in primigravid women with no history of uterine surgery.

CLINICAL FEATURES

Risk factors

The **most important risk factor** for development of a **PAS** is **placenta previa** after a prior cesarean delivery.

The **frequency** of **PAS** increased with an increasing **number of cesarean** deliveries as follows:

- First (primary) cesarean birth, 3 percent
- Second cesarean birth, 11 percent
- Third cesarean births, 40 percent
- Fourth cesarean births, 61 percent
- Fifth or greater cesarean birth, 67 percent

- In the **absence of placenta previa**, the frequency of a **PAS** in women undergoing cesarean delivery was much **lower**:
 - First (primary) cesarean birth, 0.03 percent
 - Second cesarean birth, 0.2 percent
 - Third cesarean birth, 0.1 percent
 - Fourth or fifth cesarean birth, 0.8 percent
 - Sixth or greater cesarean birth, 4.7 percent

Other risk factors include:

- A history of uterine surgery (eg, myomectomy entering the uterine cavity,
- Hysteroscopic removal of intrauterine adhesions, cornual resection of ectopic pregnancy,
- Dilation and curettage, endometrial ablation),
- Cesarean scar pregnancy,
- Maternal age greater than 35 years,
- Multiparity,
- History of pelvic irradiation, manual removal of the placenta,
- Postpartum endometritis,
- Infertility and/or infertility procedures (eg, especially transfer of cryopreserved embryos).

Clinical presentation

- Ideally, **PAS** is **first** suspected because of findings on obstetric **ultrasound** examination while the patient is **asymptomatic**.
- It is **often diagnosed** during prenatal **sonographic screening** of women with a **placenta previa** or a **low anterior placenta** and **prior uterine surgery**.
- In women with **less prominent risk factors** for abnormal placental attachment, it may be an **incidental finding** during routine **ultrasound examination**.
- The **first clinical** manifestation of **PAS** is usually profuse, **lifethreatening hemorrhage** that occurs at the **time** of attempted **manual placental separation**.

Possible laboratory findings

- **Elevated maternal serum alpha-fetoprotein (MSAFP)** – Several series and case reports have reported an association between PAS and otherwise unexplained elevations in secondtrimester MSAFP concentration.
- Moreover, **a normal MSAFP** does **not exclude** the diagnosis.
- pregnancy-associated plasma protein A, free beta-human chorionic gonadotropin) have also been associated with PAS and are also **not useful clinically** because of their very low positive predictive value.

Hematuria

- Placenta percreta with bladder invasion can cause hematuria during pregnancy.
- Cystoscopy was performed in 12 patients but was not useful for making a preoperative diagnosis.
- This may be due to microscopic invasion of the bladder that is not visible on cystoscopy but can lead to hematuria.

Consequences

- When removal of the placenta is attempted after delivery, the lack of a normal plane of cleavage between the placental basal plate and the uterine wall results in major hemorrhage.
- The hemorrhage is especially severe with more invasive placentation because of greater hypervascularity of the placental bed .

Potential sequelae of massive hemorrhage include:

- Disseminated intravascular coagulopathy,
- Adult respiratory distress syndrome,
- Renal failure,
- Unplanned surgery,
- Death, as well as potential complications from transfusion.

Peripartum hysterectomy and transfusion

- PAS is a common indication for peripartum hysterectomy, either to prevent or to control postpartum hemorrhage.

A review of 109 cases of placenta percreta reported the following types and frequencies of complications:

- Transfusion of over 10 units (44 cases),
- Infection (31 cases),
- Maternal death (8 cases),
- Ureteral ligation or fistula formation (5 cases each), and
- Spontaneous uterine rupture (3 cases).

PRENATAL CARE

- All patients with suspected PAS should be counseled about the diagnosis and potential sequelae (eg, hemorrhage, blood transfusion, cesarean hysterectomy, maternal intensive care unit admission).
- Consultation with a maternal-fetal medicine specialist is desirable, and transfer to a Center of Excellence for placenta accreta is strongly advised .
- Patient should deliver at a facility where she can receive level III maternal care.

For patients with placenta previa-accreta, prenatal care follows typical guidelines for management of placenta previa :


- Correction of **iron deficiency** anemia, if present.
- Antenatal **betamethasone** between 23 and 34 weeks of gestation for pregnancies at increased risk of delivery within seven days (eg, antepartum bleeding).
- **Anti-D immune globulin** if vaginal bleeding occurs and the patient is RhD-negative.
- **Avoidance of pelvic examination and rigorous physical activity.** Many clinicians recommend **avoidance of sexual activity**, although any **benefit is unproven.**
- Consideration of **hospitalization** in the **third trimester** in the setting of vaginal bleeding, contractions, or residence at a remote distance from a center of excellence for PAS.
- **Asymptomatic** women can be followed as **outpatients** as long as they are appropriately counseled and can get to the hospital rapidly if symptoms develop .

- **Serial sonographic** assessment of the placenta is generally **not useful** after the diagnosis of accreta, increta, or percreta has been made.
- However, a **sonogram at 32 to 34 weeks** can precisely locate the placenta and help to assess the likelihood of bladder involvement.
- This information is useful for surgical planning and delivery.


PREPARATION FOR DELIVERY

- Components of preoperative planning
- It is critical to develop a plan preoperatively for managing women with a high likelihood of PAS.
- The goal is reduce the risk of massive postpartum hemorrhage.
- Cesarean hysterectomy is usually performed because if left in situ, subinvolution often results in postpartum hemorrhage.

- Specific components of preoperative planning and care that should be addressed include:
- **Informed consent** – Discussion of potential **intraoperative complications and interventions** (eg, severe hemorrhage, blood transfusion, injury to or partial resection of bladder and bowel, hysterectomy to control bleeding, risk of postoperative vesicovaginal fistula).

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- **Multidisciplinary care team** – Management by a multidisciplinary team and delivery in a tertiary care facility improve outcomes and lower complication rates .
 - We schedule a multidisciplinary conference with all of the key care participants **at least two weeks prior to planned delivery** to ensure that all necessary preparations are completed and management plans implemented.

- The multidisciplinary team **includes** maternal-fetal medicine specialists, anesthesiologists, neonatologists, interventional radiologists, and blood bank and nursing personnel.
- It is desirable to have a **surgeon** in the operating room who has **extensive experience** with wide dissection of the parametrium and exploration of the retroperitoneum in the event this expertise is required for control of bleeding, bladder resection, and/or isolation, partial resection, and/or reimplantation of the ureters.
- Some **obstetrician-gynecologists** have this **experience**; **general surgeons**, **urologists**, and **vascular surgeons** also have expertise in this area.

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- If an appropriate **multidisciplinary** team and support services are **not available** at the site the patient plans delivery, she should be **transferred** to a **tertiary facility** that has the capability to most effectively manage major intraoperative hemorrhage and provide postoperative intensive care.

Scheduled delivery

- Delivery should be scheduled at a time with optimal availability of necessary personnel and facilities.
- Planned delivery is associated with less intraoperative blood loss than emergency delivery.

Cesarean hysterectomy

- In most cases, a definitive decision regarding conservative management or cesarean hysterectomy should be made preoperatively.
- Recommend cesarean hysterectomy, leaving the placenta undisturbed in situ when the prenatal diagnosis of placenta accreta is reasonably certain based on imaging studies and/or clinical risk factors (women with placental implantation at the site of prior uterine surgery).

- **Intravenous access** – At least two large bore intravenous catheters should be placed.
- **Thromboembolism prophylaxis** – Pneumatic compression devices should be placed, given that surgery, major hemorrhage, and blood transfusion all increase the risk of postpartum venous thrombosis.
- **Blood products** – We ensure availability of comprehensive blood product replacement. The Blood Bank should be notified, and adequate red blood cells, fresh frozen plasma, cryoprecipitate, and platelets should be available at delivery; the median estimated blood loss has been reported to be 2.5 to 7.8 liters.

Drugs

- **Tranexamic acid** inhibits fibrin degradation and reduces the risk of death due to postpartum bleeding.
- However, efficacy specifically in PAS (either as treatment for active bleeding or as a prophylactic agent) is uncertain.
- Use of **recombinant VIIa** for control of obstetric hemorrhage is under investigation.

- **Bladder** – A **three-way Foley catheter** and ureteral stents should be available in case they are needed to assess integrity of the urinary tract.
- This is **critical** in cases in which **bladder resection is required**.
- **Preoperative** placement of **ureteric stents** may be **most useful** in women with a **percreta** given the likelihood that hysterectomy will be complicated .
- Although **stents** in this setting are of unproven efficacy and very rarely can be associated with complications, **morbidity is low**, and they are routinely used by many groups.
- **Routine preoperative cystoscopy is not recommended.**

- **Anesthesia** – General anesthesia is most commonly performed .
- Regional anesthesia, typically with continuous epidural, has been used successfully in scheduled deliveries.
- **Positioning** – Placing the patient in a lithotomy position or with legs flat on the table but separated provides access to the vagina and cervix, which can facilitate hysterectomy .
- It is also important to be able to assess bleeding through the vagina that may occur intraoperatively. Such bleeding may not be appreciated in the abdominal cavity until the patient has cardiovascular decompensation.
- **Postoperative care** – An intensive care unit bed should be available for postoperative care, if needed.

Endovascular intervention for hemorrhage control

- **Prophylactic endovascular intervention** with a balloon catheter in both internal iliac arteries, uterine artery embolization, or a combination of the two may be used to reduce bleeding during or after delivery.
- The choice depends on the operator's expertise and the available equipment.
- The value of endovascular intervention remains controversial, and it is not possible to predict which patients are most likely to benefit from this procedure.

Risks

- While catheter-related complications have been reported in small observational series (5 percent in the above meta-analysis), reliable data on complication rates in this clinical setting are not available.
- The risk of a vascular complication with percutaneous coronary artery intervention using femoral artery access, a well-established analogous procedure, is approximately 3 percent.
- Groin or retroperitoneal hematoma is the most common complication; most patients do not require transfusion.

- **Planning** – If prophylactic endovascular intervention is planned, the patient should undergo delivery on a fluoroscopy table so that the procedure can be performed intraoperatively immediately after delivery of the infant.
- **Procedure** – Preoperatively under fluoroscopic guidance, an angiographer inserts a catheter into each femoral artery and guides it to the desired target vessel.

- For balloon occlusion, balloon-tipped catheters are introduced into the target artery.
- After delivery of the newborn, the balloons can be inflated intermittently for up to 20 minutes to reduce bleeding in the operative field, which facilitates placement of clamps and sutures and decreases total blood loss.
- Catheters may be left in situ for several hours postoperatively, and used for selective embolization of small pelvic vessels if postoperative bleeding occurs.
- They are removed under fluoroscopic guidance.

- In a **modification** of this **standard approach** In a modification of this standard approach, the **balloontipped** catheters are placed **before surgery**, the **uterine** and **abdominal incisions** are **closed** after the infant is delivered, and the patient is transferred to the angiography unit for embolization of the uteroplacental bed.
- The patient is then **immediately** returned to the operating room for hysterectomy.
- Blood loss was significantly less than that in patients undergoing hysterectomy without embolization.
- This approach **requires further study** to determine safety and efficacy compared with the standard approach.

DELIVERY

Timing

- For **stable** (no bleeding or preterm labor) patients, we advise planned **delivery between 34+0 and 35+6 weeks** of gestation, in agreement with the American College of Obstetricians and Gynecologists.
- For women at **high risk** of **emergency delivery before 34 weeks**, planned delivery before 34 weeks may be reasonable.
- Antenatal **betamethasone** is administered according to standard guidelines.


- Most women with **no bleeding, contractions, or rupture of membranes** remain **stable** through 36 weeks of gestation.
- For those who become **unstable** between 34 and 36 weeks, outcomes with emergency delivery still appear to be favorable in centers of excellence.
- Therefore, we **individualize timing of planned delivery within this interval based on clinical symptoms, obstetric history (eg, prior preterm birth), cervical length, and logistical considerations (distance from a center of excellence)**.

- The Society for Maternal-Fetal Medicine recommends delivery between 34 and 37 weeks of gestation for stable women with placenta accreta .
- An international panel suggested delivery at ≥36+0 weeks in **asymptomatic** women (no bleeding, rupture of membranes, or preterm labor) and no history of preterm birth .
- They suggested delivery at around 34+0 weeks in women with a **previous preterm birth, multiple episodes of minor bleeding, or a single episode of substantial bleeding.**
- **Optimal timing** of delivery remains **controversial** and individualized management is appropriate.

Procedure

Cesarean hysterectomy

- We typically make a vertical midline skin incision or a Cherney incision ,
- However, others may choose to make a transverse incision (eg, Pfannenstiel) in cases with a low likelihood of intraoperative complications (eg, posterior placenta not extending to the serosa).

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- An **intraoperative ultrasound** examination is useful to map the placental edge and determine the **best position** for the hysterotomy incision, which should avoid transecting the placenta.
 - We make a **vertical hysterotomy** at least **two fingerbreadths** above the **placental edge**; leaving a myometrial margin between the placenta and incision helps to prevent disruption of the placenta during opening or closing of the uterus.
 - After delivery of the infant, the cord is cut, the uterine incision is rapidly closed to decrease blood loss, and hysterectomy is performed.

- Prophylactic oxytocin is not routinely administered after the infant is delivered because it may lead to partial placental separation and, in turn, **increased bleeding** .
- However, if the placenta has been mostly or completely removed or bleeding is already heavy, then uterotonic drugs should be given.
- We **avoid internal iliac** (hypogastric) **artery ligation** because it is time consuming, operator dependent, ineffective (without hysterectomy) for controlling pelvic hemorrhage in up to 60 percent of cases , and precludes use of selective pelvic angiography and embolization if needed subsequently.

Management of placenta percreta with bladder invasion


- Placenta **percreta** with bladder invasion may require **partial cystectomy**.
- Ideally, a urogynecologist, urologist, or gynecologic oncologist should be consulted when the bladder is involved.
- Cystoscopy or intentional cystotomy at surgery is often helpful for assessing the degree of bladder, and possible ureteral, involvement.

CONSERVATIVE MANAGEMENT OF PLACENTA ACCRETA

Potential candidates


Uterine conservation may be considered in:


- Patients who very much want to **preserve fertility**.
- Such patients should be **counseled** extensively regarding the **risks** of hemorrhage, infection, possible need for intra- or postoperative lifesaving hysterectomy, and even death, as well as suboptimal outcomes (including recurrence or hemorrhage in future pregnancies).

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- When hysterectomy is thought to have an unacceptably high risk of hemorrhage or injury to other organs, which may be mitigated by leaving the placenta in situ .
 - When placental resection is thought to be possible because of focal accreta or a fundal or posterior placenta.

Uterine conservation with the placenta left in situ

- In this approach (called expectant management), the placenta is left in situ after delivery of the newborn.
- The umbilical cord is ligated at its placental insertion site; the hysterotomy is closed in the standard way; and uterotonic drugs, compression sutures, intrauterine balloon tamponade, uterine artery embolization, and/or uterine artery ligation are variably used.
- **Delayed hysteroscopic resection** of placental remnants has been used successfully to expedite resolution of the placenta or treat delayed bleeding and/or pelvic pain, but experience is limited.

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- Delayed-interval hysterectomy is another option, particularly for patients with placenta percreta, but experience is limited and experts have recommended against it .
 - Clinicians experienced with the technique have suggested it as an option for only the most severe, potentially life-threatening cases of placenta percreta or when immediate hysterectomy is too dangerous because of the extent of placental invasion or lack of appropriate resources.
 - Experience with this approach has yielded mixed results, and no high-quality data regarding the advantages and disadvantages compared with planned cesarean hysterectomy exist.

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- Adjunctive therapy with **methotrexate** therapy should **not be used**.
 - There is no convincing evidence that it improves any outcome when the placenta is left in situ, and there is clear evidence of drug-related harms (eg, **pancytopenia, nephrotoxicity**)

Complications

- The prolonged course and significant **risks** of **uterine conservation** with the **placenta left in situ** were illustrated by a systematic review of 10 cohort studies.
- Severe vaginal bleeding: 53 percent
- Sepsis: 6 percent
- Secondary hysterectomy: 19 percent (range 6 to 31 percent)
- Death: 0.3 percent (range 0 to 4 percent)
- Subsequent pregnancy: 67 percent (range 15 to 73 percent)

- Long-term reproductive outcomes following conservative management appear to be **suboptimal**, but data are limited.
- Although there appears to be an **increased risk** of developing **intrauterine synechiae**, most women who desire another pregnancy are able to conceive and are at increased **risk** of **recurrent placenta accreta**.

Uterine conservation with placental resection

- Uterine conservation with placental resection may be successful without excessive risk in two clinical settings:

Focal accreta

- Management involves oversewing the bleeding sites or removing a **small wedge** of uterine tissue containing the focally adherent placenta.

Fundal or posterior placenta accreta

- In contrast to anterior placenta accreta, the authors' experience is that **uterine conservation** may be **possible** for a **posterior or fundal accreta**, since **bleeding** after removal of placenta accreta in these locations is **more readily controlled** medically, with interventional radiology, and with conservative surgery.


Recurrence in future pregnancies

- PAS occurs in 22 to 29 percent of future pregnancies of women successfully managed conservatively .
- Women who choose to become pregnant again should be aware of this risk and consult with a maternal-fetal medicine specialist early in pregnancy to facilitate diagnosis and management.

UNEXPECTED PLACENTA ACCRETA

At cesarean delivery

- Some cases of placenta accreta are first recognized at cesarean delivery, typically repeat cesarean delivery.
- Upon entering the peritoneal cavity, the surgeon may make the diagnosis of PAS if one or more of the following are seen:
- Placental tissue invading the lower uterine segment, serosa, or bladder.
- Increased and tortuous vascularity along the serosa of the lower uterine segment. Vessels may run cranio-caudally in the peritoneum.
- A bluish/purple and markedly distended lower uterine segment bulging toward the pelvic sidewalls.


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- It is important to distinguish these findings from a placenta normally attached underneath a uterine window (uterine scar dehiscence).
 - In these cases, the uterine tissue and vessels appear normal.
 - If the diagnosis is uncertain, then gentle digital exploration for plane of cleavage can be attempted; the absence of a plane is diagnostic.

Management

- If PAS is suspected before the hysterotomy, it is important to avoid or minimize manipulation of the uterus or sites of possible extrauterine placental extension as this can precipitate life-threatening hemorrhage.

- If the patient is not bleeding heavily, mother and fetus are **stable**, and resources for managing these complicated cases are not immediately available, the uterus can be covered with warm packs and further surgery delayed until appropriate personnel and other resources are available.
- If the **patient is not bleeding heavily**, mother and fetus are **stable**, and assembling these resources is not possible locally, the abdomen should be closed and the patient expeditiously transferred to a facility that can manage these patients, although the risk of massive hemorrhage in transit must be considered.

- If the mother is bleeding heavily and/or the fetus is compromised, the **best option is delivery through a hysterotomy far from the placenta**, followed by closure of the hysterotomy with the **placenta left undisturbed** until appropriate personnel and resources for maternal care are available.
- **Intraoperative ultrasound** using a probe with a **sterile cover** can indicate the placental location.
- If there is **no time** for ultrasound examination, in most cases, a **hysterotomy in the posterior uterus or fundus will avoid the placenta.**

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- Women who are bleeding heavily or otherwise **unstable** need to be managed as optimally as allowed by the clinical setting and available resources.
 - This includes resuscitation with fluid and blood products, standard surgical procedures for controlling hemorrhage, and pressure on bleeding sites (digital, abdominopelvic packs); infrarenal aortic compression or aortic crossclamping can be used in an attempt to control life-threatening hemorrhage.
 - Direct pressure on a percreta should be avoided or applied cautiously as it may increase the size of the bleeding area. A massive transfusion protocol is useful.

At vaginal delivery

- **Rarely**, a focal or complete placenta accreta is first recognized at the time of manual removal of a retained placenta after vaginal delivery.
- Life-threatening hemorrhage may occur.
- These patients **should receive fluids and transfusion**, as appropriate, while being **prepared for laparotomy and surgical management**.

POSTOPERATIVE CARE

- An **intensive care unit** bed should be available for postoperative care, if needed.
- These patients may require ventilator support due to pulmonary edema from massive fluid resuscitation or fluid shifts, or from acute transfusion-related lung injury .
- Some patients need vasopressor support and invasive hemodynamic monitoring.
- Postoperative bleeding may occur, and the availability of interventional radiology to provide angiographic embolization of deep pelvic vessels, thus avoiding reoperation, can safely enhance patient care.



Thanks