Placenta Percreta and the Urologist

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Placenta percreta, the rarest and most severe form of placenta accreta, can involve the urinary bladder. Because of its propensity for severe hemorrhage, it is a potentially life-threatening condition. Although commonly discovered at the time of delivery, antenatal diagnosis may be achieved with ultrasound, magnetic resonance imaging, and/or cystoscopy. Every attempt should be made to minimize potential for blood loss by avoiding removal of the placenta at the time of delivery and either performing a hysterectomy or using methotrexate therapy to ablate the residual placenta in the postpartum period. If hemorrhage does occur during delivery, immediate surgical removal of the uterus should be considered and, depending on the severity of the hemorrhage and the depth of invasion of the placenta into the bladder, excision and/or reconstruction of the bladder may be necessary.
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Major obstetric hemorrhage is the leading cause of maternal morbidity and mortality.[1] In rare cases, life-threatening hemorrhage in pregnant women may result from abnormal invasion of the bladder by the placenta. Retained placental membranes and tissues are responsible for 5% to 10% of postpartum hemorrhages. Normally, a layer of decidua separates the placental villi and the myometrium (the inner layer of the uterus) at the site of placental implantation. When the placenta directly adheres to the myometrium without the

Table 1
Classification of Placenta Accreta by Degree of Invasion

Placenta accreta vera	Placental villi adhere to superficial myometrium
Placenta increta	Placental villi adhere to the body of the myometrium
Placenta percreta	Placental villi penetrate the full thickness of the myometrium

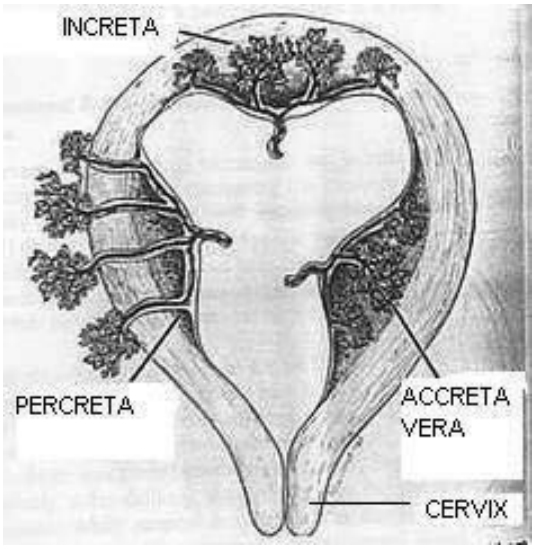


Figure 1. *Placenta accreta is classified according to the degree of invasion into the myometrium.*

presence of an intervening decidua, this condition is known as *placenta accreta*, which is one cause of retained placental tissue.

Placenta accreta is classified according to its degree of invasion into the myometrium (Table 1, Figure 1): placenta accreta vera, placenta increta, and placenta percreta. *Placenta accreta vera* is a term used to denote a placenta with villi that adhere to the superficial myometrium. *Placenta increta* occurs when the villi adhere to the body of the myometrium, but not through its full thickness. *Placenta percreta* occurs when the villi penetrate the full thickness of the myometrium and may invade neighboring organs such as the bladder or the rectum. Although the exact cause of placenta accreta is unknown, it is associated with several clinical situations such as previous cesarean delivery, placenta previa, grand multiparity, previous uterine curettage, and previously treated Asherman syndrome, which is a condition characterized by the presence of scars within the uterine cavity.[2]

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Bladder invasion by the placenta (placenta percreta) is a potentially life-threatening obstetric complication, albeit a rare one. The diagnosis is usually established when attempts are made to separate the adherent placenta from the bladder. This maneuver causes massive hemorrhage that is often quite challenging to control. A firm preoperative diagnosis allows adequate preparation and organization of multidisciplinary help for what may be a difficult surgical procedure requiring massive blood transfusion. Use of newer intervention techniques and alternate surgical approaches may decrease morbidity and blood loss. Urologists are usually consulted after a life-threatening emergency situation has already arisen.[3] Familiarity with this condition is crucial for effective management. Herein, we present a case report, followed by a discussion of the alternatives for diagnosis and management of placenta percreta.

Case Report

A 27-year-old woman presented at 32 weeks of gestation with premature preterm rupture of membranes. Prenatal ultrasound was noted as normal. Ultrasound at the time of presentation, however, revealed evidence of compromised blood flow through the umbilical cord. The pregnancy was without complications up to the day of presentation. The patient's obstetric history was significant for 1 prior pregnancy delivered by cesarean and complicated by placenta previa.

The patient was taken for emergency cesarean delivery. A healthy, 1840-g male was delivered. The placenta, however, could not be removed with gentle traction, and no surgical plane could be identified between the uterine wall and the placenta,

suggesting the presence of some form of placenta accreta. The obstetricians immediately proceeded with an emergency hysterectomy, during which time the lower uterine segment was found to be densely adherent to the bladder wall.

The urology service was then consulted. Intraoperatively, an 8-cm cystotomy was noted at the bladder dome. The posterior bladder had a significant amount of placental tissue invading the muscularis. The bladder mucosa was noted as normal throughout. Both ureteral orifices were cannulated with 6-Fr feeding tubes and hemostasis was achieved over the remaining placental and uterine tissue with a series of figure-8 sutures. The bladder was then closed in 2 layers with running absorbable sutures, a 24-Fr Foley catheter was placed, and the bladder was irrigated to ensure water-tight closure. The procedure was subsequently terminated after placement of a drain anterior to the suture line of the bladder and closure of the abdomen.

The patient was then admitted to the intensive care unit for 24 hours, transferred to the ward, and discharged home on postoperative day 4 after removal of the abdominal drain. The Foley catheter was left in place.

Outpatient cystogram performed 4 weeks postoperatively revealed no extravasation of contrast material. The Foley catheter was removed and the patient has not experienced further urinary difficulties.

Discussion

Placenta accreta occurs in approximately 1 in 2500 pregnancies. Of these, approximately 75% to 80% are placenta accreta vera, about 17% are placenta increta, and the remaining 5% or so are placenta percreta. Although the overall incidence of placenta percreta is extremely low, the appearance of this rare disorder seems to be increasing due to the performance of more cesarean deliveries in the past few years.[4] About 75% of placenta percreta cases are associated with placenta previa.[3]

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Most cases of placenta percreta that involve the bladder are recognized only at the time of delivery. Gross hematuria, surprisingly, is rare even when the bladder is invaded and occurs in only about 25% of such cases.[5] Unlike the painless third trimester prepartum hemorrhage common with placenta previa, vaginal bleeding of placenta percreta is more likely to be painful due to invasion of the hemorrhaging placental tissue into the uterine wall. Some patients with placenta percreta have even described a history of dull, continuous lower abdominal pain during their pregnancy.[3] When a multiparous woman with a history of a previous cesarean delivery is found to have a placenta previa, especially with coexistent hematuria, the possibility of bladder invasion by an adherent placenta should be considered. Microscopic or gross hematuria should prompt further evaluation in the setting of other clinical signs and symptoms resulting in suspicion of placenta percreta.

Evaluation to identify whether placenta percreta may be present includes ultrasound, magnetic resonance imaging (MRI), and cystoscopy. Grayscale ultrasonography, when performed in the first trimester, will reveal a low-lying uterine sac with a thin myometrium. Sonographic findings during the second and third trimester include placental lacunae (vascular lakes of various shapes and sizes seen within placental parenchyma),[6] an irregular border between the bladder and myometrium, a thin myometrium, and loss of clear space (loss of the decidual layer of the placenta). Doppler ultrasonography will often reveal turbulent blood flow extending from the placenta to surrounding tissues. MRI may reveal nonvisualization of the inner layer of the placenta-myometrium interface on half-Fourier single-shot turbo spin-echo images.[7] Cystoscopy may often show posterior bladder wall abnormalities. Biopsy and/or fulguration of these abnormalities should be avoided, as this may precipitate massive hemorrhage.[5]

In the setting of a preoperative diagnosis of placenta accreta, manual removal of the placenta should be avoided. No intervention should be entertained until delivery of the baby has occurred. Once delivery has occurred, the presence of unstoppable uterine bleeding from the retained part of the placenta may force the obstetrician to perform a hysterectomy. Intraoperative internal iliac artery embolization after preoperative cannulation or prophylactic bilateral ligation may be performed to prevent excessive blood loss at the time of hysterectomy.[4] In patients with massive intraoperative hemorrhage from placenta percreta, isolation and temporary occlusion of the infrarenal aorta may

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help to decrease bleeding and allow the surgical team to assess and manage the situation more effectively.[3] A transvaginal pressure pack has been used to stop the hemorrhage when coagulopathy ensues and hemostasis becomes difficult to achieve.[8]

However, if uterine bleeding from the retained placenta percreta is controlled after delivery, strong consideration for the use of methotrexate rather than any further surgical intervention should be considered. Similar to its use in management of ectopic pregnancy, oral methotrexate will destroy all viable products of conception by its inhibition of dihydrofolate reductase. Conservative management with methotrexate should be performed with caution, however, and complications such as delayed bleeding and delayed hysterectomy should be expected.[9]

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In the presence of bladder wall invasion and in the setting of uncontrolled uterine bleeding following delivery, every attempt should be made to preserve the bladder, as this has been demonstrated to be a reasonable possibility provided that the integrity of the ureters is established during and after the operation. Reconstructive surgery, if necessary, may be postponed until after the patient is hemodynamically stabilized.[10] Although removal of the posterior bladder and distal ureters has been advocated if invasion is found at time of delivery, resection of the bladder base with the distal ureters can be performed, but it carries the risk of coagulopathy, transfusion reaction, sepsis, adult respiratory distress syndrome, multiorgan failure, and vesicovaginal fistula due to aggressive blood transfusion and extensive surgery.[3,11,12] Regardless of the decision whether to remove the bladder, anterior bladder wall cystotomy is particularly helpful for defining dissection planes and determining whether posterior bladder wall resection is required.[3]

Conclusion

Placenta percreta, which can affect any neighboring uterine structure, is a life-threatening condition. When it involves the urinary bladder, a multidisciplinary approach utilizing a team of physicians and surgeons representing urology, radiology, and obstetrics-gynecology is the key to successful management. Every attempt should be made to achieve the diagnosis antenatally, to minimize blood loss, and to preserve the bladder. ■

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Main Points

- Placenta accreta is a potential cause of life-threatening maternal hemorrhage.
- Placenta accreta can be classified by degree of invasion into the uterine wall: placenta accreta vera, placenta increta, and placenta percreta.
- Although commonly found at time of delivery, antenatal diagnosis of any of these conditions may be made with ultrasound, magnetic resonance imaging, and/or cystoscopy.
- Indications for investigation for placenta percreta include the presence of gross or microscopic hematuria, previous cesarean delivery or other uterine surgery, abdominal pain, and/or vaginal bleeding during the second or third trimester.
- Management of placenta percreta may be achieved with intraoperative ligation or embolization of the internal iliac arteries, immediate hysterectomy or therapy with methotrexate, and preservation of bladder tissue whenever possible.