

Placenta Percreta with Bladder Invasion: Delayed Bladder Bleeding After Hysterectomy

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Abstract: Placenta percreta is a rare condition, which can lead to significant morbidity and potentially, mortality. This paper discusses two cases of complete placenta previa with placenta percreta invading the urinary bladder. Both patients underwent caesarean hysterectomy and experienced delayed bladder bleeding postoperatively.

Keywords: Placenta percreta; Bladder invasion; Placenta accreta spectrum; Delayed bladder bleeding; Caesarean hysterectomy

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1. Introduction

Placenta accreta spectrum refers to a range of pathologic adherence of the placenta, including placenta accreta, placenta increta, and placenta percreta ^[1]. Placenta percreta is the most serious and rare form among the three, which is characterized by the invasion of placental chorionic villi into and beyond the uterine myometrium, sometimes into the surrounding structures, commonly invading the bladder anteriorly and rarely invading the rectum posteriorly ^[2]. Maternal morbidity and mortality can occur because of severe and sometimes life-threatening hemorrhage, which often requires blood transfusion ^[3]. Not only that, hysterectomy and ureteral or bladder injury are serious complications of surgery ^[4]. The incidence of injury to the urinary system intraoperatively and postoperatively is extremely high when the placenta invades the bladder, especially in situations of placenta previa and a previous cesarean delivery. It is rare for delayed bladder bleeding to occur after hysterectomy and active management in such cases. However, in two cases, despite aggressive hysterectomy, it is found that the occurrence of delayed bladder bleeding with placenta percreta is not unusual; therefore, these two cases are discussed in this paper to learn and gain experiences for perioperative management of placenta percreta.

2. Case discussion

2.1. Case 1

A 33-year-old woman, gravida 5, 1-0-3-1, who had one previous cesarean delivery for placenta previa and three curettages done in the past, presented at 28 weeks of gestation for prenatal diagnosis, of which magnetic resonance imaging was suggestive of complete previa in view of placenta percreta with serosal invasion of the bladder.

She was hospitalized at 34 weeks and 5 days of gestation and steroids were administered to promote fetal lung maturation. Upon admission, a multidisciplinary team involving several departments (anesthesiology, gynecologic oncology, urology, radiology, and neonatology) were consulted. An elective midline laparotomy was planned at 35 weeks. Preoperatively, she accepted the placement of a balloon for abdominal aortic occlusion and a double-J ureteric stent through cystoscopy, which revealed a bulging posterior bladder wall with extensive vascularization.

A parallel incision to the uterine corpus was made to avoid the placental location, a viable neonate was delivered with Apgar scores of 10-10-10, and subsequently, subtotal hysterectomy was performed after verifying that the placenta will not deliver spontaneously. The bladder was carefully dissected from the lower uterine segment by a combination of both, blunt and sharp dissection using a strict hemostatic technique, starting from the side opposite to that of which the placenta is more bulging. Electrocoagulation hemostasis was performed on the oozing spots on the serosal surface of the posterior bladder wall, and the bladder wall remained intact. Meanwhile, the interventional radiology procedure of abdominal aortic balloon occlusion greatly helped in decreasing the blood loss during surgery. The total blood loss was about 2.4 liters, in which the patient was transfused with 7 units of packed cells and 400 cc of plasma; a Foley catheter was also placed for 3 days.

On the third day after surgery, upon defecation, the patient had an episode of gross hematuria with passage of clots from the external orifice of her urethra and the foley catheter, about 200 cc. Ultrasound revealed about 400 cc of blood clots in the bladder. The patient received conservative treatment, which includes hemostatic drugs, anti-infectives, bladder irrigation, and blood transfusion. A total number of 6 units of packed cells and 200 cc of plasma were intermittently transfused. On postoperative day 10, the persistent gross hematuria was still uncontrolled.

Cystoscopy revealed diffuse oozing on the posterior wall of the bladder, 500 cc of organized clots were evacuated, the double-J ureteral stent was removed, and bleeding points were cauterized. Postoperatively, the patient was stable, and her urine was clear as well. Following-up to six months postpartum, there was no bladder fistula or ureteral fistula found.

2.2. Case 2

A 39-year-old woman, gravida 3, 2-0-0-2, with twice previous cesarean deliveries, was found to have placenta percreta via ultrasound during her first examination at 20 weeks of gestation. However, she did not receive regular prenatal care and was hospitalized at 39 weeks and 5 days of gestation with an ultrasound imaging showing placenta percreta with highly suspicious involvement of the bladder. This finding was confirmed by magnetic resonance imaging upon admission. Similarly, this case was approached from a multidisciplinary team perspective, with preoperative placement of balloon into the abdominal aorta, preoperative cystoscopy, and a double-J ureteric stent placement. The cystoscopy showed a bulging posterior bladder wall with extensive vascularization. The same surgical protocol was performed, followed by subtotal hysterectomy upon confirming the diagnosis of placenta percreta. A rupture in the posterior wall of the bladder was found while dissecting the bladder from the lower uterine segment.

The bladder was repaired, followed by a wide bore urethral catheter placement and bilateral DJ stent placement. A similar situation occurred, in which the patient had an episode of gross hematuria with passing of clots on postoperative day 3. She underwent emergency cystoscopy, which revealed massive clots in the bladder, which could not be removed. Taking into consideration of a re-rupture of the posterior bladder wall, the patient was pushed for laparotomy, wherein the bladder clots were evacuated, a secondary repair was performed, and a suprapubic cystostomy was created for irrigation, with a suprapubic catheter placed. The patient required 5.5 packed cells and 600 cc of fresh frozen plasma. The suprapubic catheter and DJ stents were removed after 7 weeks on confirming a normal cystogram.

3. Discussion

Placenta percreta is a rare, serious condition that can cause life-threatening bleeding at delivery, resulting in significant maternal morbidity and mortality. This condition occurs when chorionic villi invade through the myometrium, serosa, and into adjacent organs, of which the bladder is the most likely organ to be invaded, especially at the trigone, usually presenting with extensive vascularization.

When the placenta invades the bladder, gross hematuria may occur during the second or third trimester. Rarely cases report that placenta percreta patients with bladder invasion undergoing conservative management of placental in situ preservation develop persistent hematuria during the monitoring period^[5], and no reports were found on persistent hematuria after hysterectomy.

Generally, with the presence of anterior placenta previa percreta, the lower uterine segment is commonly enlarged and hypovascularized; the distorted anatomy and edema of the surrounding structures make it difficult to identify the cervicovaginal junction^[6], especially with one or more previous cesarean sections. The American College of Obstetricians and Gynecologists recommends caesarean hysterectomy as the gold standard after delivery without attempting any placental removal^[7]. Sometimes, partial cystectomy is necessary to avoid serious urinary tract injury or refractory hematuria. While delayed bladder bleeding after hysterectomy is a rare complication, its occurrence increases the loss of blood, the risk of secondary surgery, the risk of infection to the urinary tract, and the average days of hospitalization. Therefore, these two cases have been discussed in this paper to look for a better way to manage similar patients in the future and reduce the recurrence of this complication.

For both patients, the surgeries were performed by a senior obstetrician-gynecologist in a tertiary care center, who is experienced and equipped with surgical skills with respect to placenta accreta spectrum and gynecologic oncology. There was no previous case of delayed bladder bleeding in the past. The likely causes of bladder bleeding are as follows: (1) the spontaneous bleeding from the hyperplastic vessels in the bladder occurs in a short period after delivery due to the increased vascular permeability, which is affected by high levels of estrogen, progesterone, and placental growth factor in pregnancy; (2) intravesical vessel rupture may occur due to physical factors, such as movements during urethral catheter replacement, sudden increase in abdominal pressure from coughing or defecation, or other reasons that may stimulate the fragile vessels. How then to avoid delayed bladder bleeding in patients with placenta percreta with bladder invasion after cesarean hysterectomy?

- (1) Regular prenatal examinations during pregnancy are important. In the first trimester, women with previous pregnancy scar should be fully informed about the risk of continuing pregnancy, and if necessitated, pregnancy should be terminated. In the second or third trimester, if placenta percreta is found, the patient should be fully informed of the severity of the condition and followed up. Delivery may be considered at 34 to 36 weeks of gestation because the incidence of antepartum hemorrhage appears to increase markedly at 36 weeks^[8].
- (2) A multidisciplinary team (MDT) comprising of obstetricians, urologists, interventional radiologists, hematologists, intensivists, and neonatologists is crucial in the management of such cases. The team should come together preoperatively to discuss on how to reduce the blood loss and improve the patient's surgical outcome^[9]. Preoperative cystoscopy is essential to evaluate the extent of bladder wall involvement. Ureteral stenting is beneficial for identifying the ureter but it does not prevent injury during procedures^[10]. The use of arterial balloon catheters can greatly reduce the pulse pressure and transform the pelvic arterial system into a venous-like system, with slow and sluggish blood flow^[11].
- (3) Upon confirming the diagnosis of placenta percreta with bladder invasion, immediate hysterectomy should be performed after delivery without attempting placental removal. When cystoscopy shows extensive vascularization in the bladder mucosa, the managements available to prevent delayed bladder

bleeding include: preventive ligation of the internal iliac artery to reduce and slow down blood flow to the bladder, which may promote the atrophy of proliferated vessels after delivery; preventive cauterization of proliferated vessels in the bladder wall during preoperative cystoscopy when massive hemorrhage is predicted; create a plane between the placenta and bladder followed by partial cystectomy of the focal infiltration of placenta in the bladder and cauterize or ligate the proliferated vessels in vision, with the bladder repaired and a wide bore urethral catheter kept in place.

(4) Postoperative care

- (A) Increasing nutritional support and limiting liquid diet will help avoid early defecation. Nebulization and percussion on back should be performed to clear secretions. Any early activities out of bed should be performed with caution.
- (B) A three-way indwelling catheter should be used for postoperative retention, and intermittent bladder irrigation with ice saline should be used to constrict blood vessels.
- (C) The color of the urinary catheter should be monitored. A urologist should attend to the patient as soon as possible if gross hematuria is noted.
- (D) For any complaints of abdominal pain or painful urination, a detailed examination should be performed to exclude suspicious complications.
- (E) Although there will be a high risk of venous thromboembolism, prophylactic anticoagulants should not be used prematurely, which may lead to spontaneous bleeding in the bladder or intra-abdominal bleeding.
- (F) If the patient has underlying hypertension, the patient's blood pressure should be kept stable to avoid variability, which can cause blood vessels to rupture.

(5) Treatment of postoperative bladder bleeding

In the aforementioned cases, both patients developed severe bladder bleeding on the third day after surgery. The first patient was treated with conservative treatment (bladder irrigation and hemostatic drugs), but the effect was not obvious. Finally, the bleeding was controlled after electrocoagulation under cystoscopy. In the second case, cystoscopy was performed as soon as the bleeding was discovered, but the presence of large blood clots in the bladder made the surgical manipulation difficult. The patient was pushed for exploratory laparotomy, wherein the bladder clots were evacuated through an anterior cystotomy. Although bladder bleeding rarely occurs after hysterectomy, it is catastrophic and unmanageable if it does. Hemostasis under cystoscopy is recommended as soon as possible. Researchers and clinicians are now exploring more improvements in terms of surgery techniques and perioperative management to decrease the risk of bladder bleeding. When dealing with placenta percreta with bladder invasion, a multidisciplinary team approach is important. In particular, urologists are highly needed in the care of these patients. These cases are discussed in hope that experienced urologists and obstetrician-gynecologists can share their experience and knowledge on this issue.

Disclosure statement

The authors declare no conflict of interest.

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