

CASE REPORT

Placenta percreta managed by transverse uterine fundal incision with retrograde cesarean hysterectomy: a novel surgical approach

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Funding Information

No funding information provided.

Received: 10 April 2014; Revised: 17 June 2014; Accepted: 17 June 2014

Clinical Case Reports 2014; 2(6): 260–264

doi: 10.1002/ccr3.108

Introduction

Placenta previa is an obstetric complication in which the placenta is inserted into the lower uterine segment. It can be complicated with abnormal placentation, the most serious of which is placenta percreta [1, 2]. Placenta percreta is the rarest and most complicated variant of placenta accreta in which the placenta abnormally penetrates through the myometrium; it is associated with heavy obstetrical hemorrhage and bladder injury [2–4]. Severe hemorrhage can occur at the time of cesarean hysterectomy in cases with placenta percreta – blood loss from 7000 mL to as high as 47,000 mL has been reported [3, 5, 6] – and this increases the difficulty of the operative technique. Performing cesarean delivery and total abdominal hysterectomy in a patient with placenta percreta can be difficult and potentially life threatening. Although several techniques to decrease the incidence of maternal morbidity and complications have been reported [7–10], the results have not been very satisfactory [11, 12].

We report here a case of placenta percreta where we attempted a novel surgical approach. We used a combination of a transverse uterine fundal incision and

Key Clinical Message

Placenta percreta (with bladder invasion) is a rare obstetric condition with the risk of massive intraoperative hemorrhage. In these cases, the combination of a transverse uterine fundal incision and retrograde cesarean hysterectomy could be useful to minimize maternal hemorrhage and avoid severe bladder injury.

Keywords

Hemorrhage, placenta percreta, retrograde hysterectomy, transverse uterine fundal incision.

subsequent retrograde cesarean hysterectomy, with amputation of the anterior uterine wall and placenta, thereby successfully managing placenta percreta.

Case Report

A 32-year-old woman (gravida 5, para 3) at 32 weeks of gestation was diagnosed with placenta previa and was referred to our hospital from a private facility. She had a history of 3 cesarean deliveries. In her current pregnancy, the placenta was located along the entire anterior uterine wall. Ultrasonographic findings revealed multiple lacunae, and magnetic resonance imaging revealed the loss of uterine myometrium between the placenta and bladder wall (Fig. 1A and B). Therefore, she was considered to be at a high risk for placenta percreta. Fetal growth was appropriate for gestational age.

At 33 weeks, she experienced a sudden onset of vaginal bleeding. Blood loss was estimated about 100 mL and she was admitted to our hospital. She was received intravenous fluids and intramuscular betamethasone to stimulate fetal lung maturation. The day after admission, she experienced vaginal bleeding again and total blood loss was

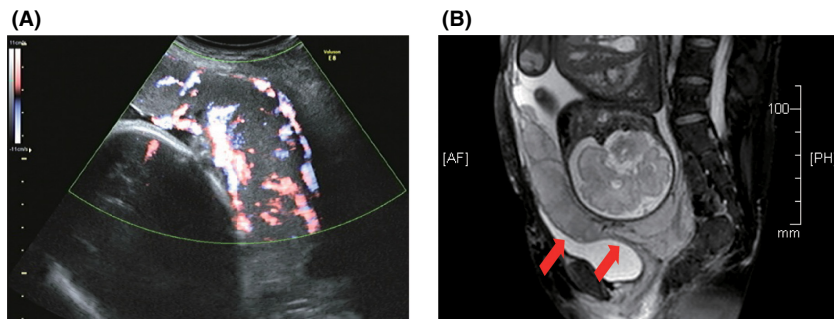


Figure 1. (A) Ultrasonography revealed multiple lacunae and placenta previa. (B) Pelvic magnetic resonance imaging was performed for suspected placenta accreta. Red arrows indicate the loss of uterine myometrium between the placenta and the bladder wall. Based on these findings, we suspected placenta increta or percreta.

estimated to be over 300 mL. We decided to perform an emergency cesarean delivery using a transverse uterine fundal incision to deliver the fetus.

An ureteral stent was preoperatively placed by a urologist. Laparotomy revealed large blood vessels and the placenta was observed through the anterior uterine wall (Fig. 2A). Based on these findings, placenta percreta was suspected and separation of the bladder from the uterus was considered extremely difficult. We performed a transverse uterine fundal incision to avoid an incision into the placenta. After elevating the uterus outside of the abdominal wall, an ultrasound-guided transverse incision was made into the uterine fundus to avoid rupturing or producing a bulge on the fetal membrane (Fig. 2B). The incision produced minimal bleeding and avoided the placenta. A healthy male infant of 2122 g was successfully delivered.

The placenta was not spontaneously delivered because of abnormal uterine adherence, vaginal bleeding continued. We initially attempted to perform hysterectomy using the bladder-filling technique; but because of adherence between the anterior uterine wall and bladder,

we could not strip the bladder from the uterus. Because of our attempt to separate the bladder, bleeding suddenly increased from the placental site and the total blood loss reached over 3500 mL. Conventional hysterectomy could have caused severe bladder injury and cystectomy. A retrograde hysterectomy and placental amputation were successfully performed (as shown in Fig. 3A).

Following hysterectomy, bleeding continued and the remaining placental tissue was resected. During the resection, a 10-mm² bladder injury was detected. The border between the bladder and placenta was visualized to separate the organs, and after complete resection of the placental tissue, we repaired the bladder. The total blood loss was approximately 7800 mL, including an estimated blood loss of 4000 mL from the placental site prior to hysterectomy; 2000 mL during hysterectomy; 1000 mL from the bladder wall after hysterectomy; and 800 mL from other sources. The patient was transfused with 3360 mL of red blood cells; 1800 mL of flash frozen plasma; and 400 mL of platelets. The excised specimens are shown in Figure 3B.

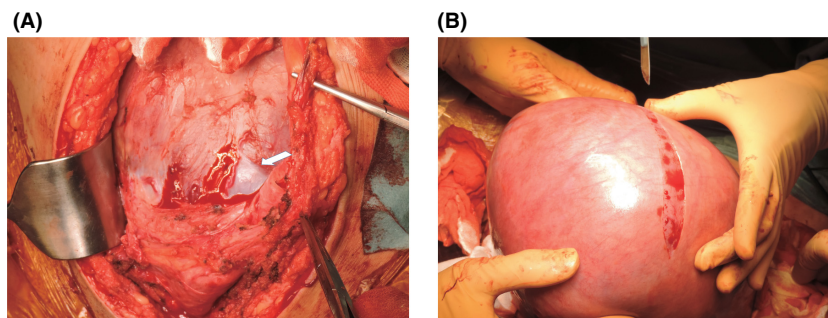


Figure 2. (A) Large blood vessels and portions of the placenta were observed through the anterior uterine wall. Surgical separation of the anterior uterine wall and the bladder was very difficult. White arrows indicate the placenta observed through the anterior uterine wall. (B) A transverse incision was made on the uterine fundus with minimal blood loss from the incision site. The fetal membrane bulged through the transverse uterine fundal incision.

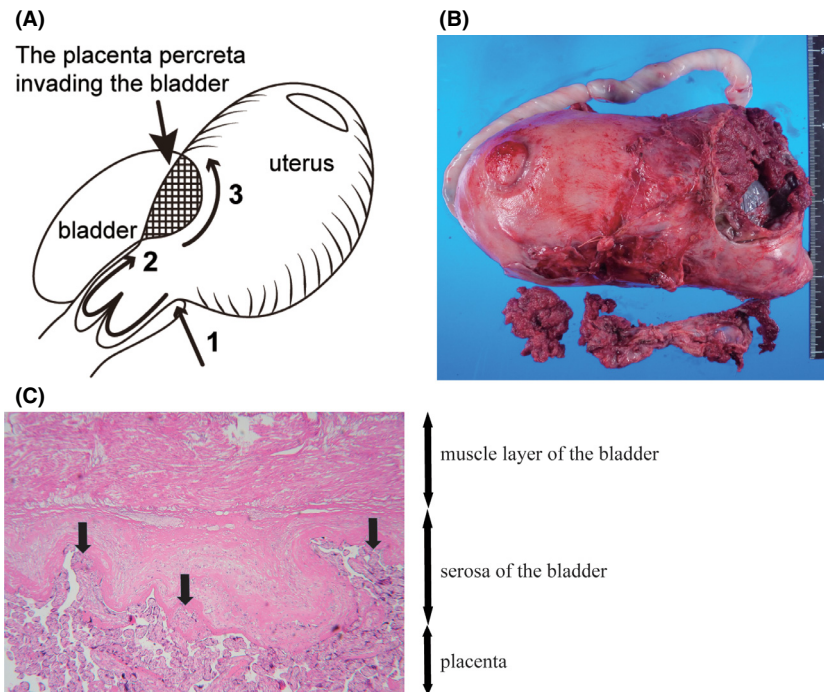


Figure 3. (A) Our retrograde cesarean hysterectomy method. First, the posterior vaginal wall was opened. Second, the uterine artery and parametrial vessels were clamped and ligated while palpating the ureters, that contained an ureteral stent placed preoperatively. Third, the circumferential vaginal wall was carefully opened. Finally, the anterior uterine wall and placenta were amputated and resected to the uterine body. (B) Retrograde cesarean hysterectomy was performed. Abnormal adherence was observed between the anterior uterine wall and the placenta. The placenta invaded the entire myometrium to the uterine serosa, confirming a diagnosis of placenta percreta. (C) A hematoxylin and eosin-stained section of the placenta (magnification 40 \times). The upper edge of the section indicates the bladder side and the lower edge of the section indicates the uterine side. The black arrows indicate the placenta invading the serosa of bladder. This finding suggests that the diagnosis is placenta percreta.

The patient was transfused with 560 mL of red blood cells after the operation. Postoperative blood pressure stabilized to 120/70 mmHg, and pulse rate was 90 beats/min. A complete blood count indicated a hematocrit level of 29.6% and a hemoglobin level of 10.6 g/dL. Because of the substantial hemorrhage, considerable blood transfusions were required; and she was subsequently placed in the intensive care unit. She had an uncomplicated postoperative course and was discharged 10 days later. The infant was discharged 30 days later in a healthy condition.

A hematoxylin and eosin-stained section of the placenta (Fig. 3C) revealed the placenta invaded the serosa of bladder. These findings suggested the diagnosis was placenta percreta. As shown in Figure 3B, the lower uterine segment was resected from the uterine body and the residual tissues were resected step by step from the bladder. We considered the placental tissue to be completely resected, and this was confirmed by a negative qualitative human chorionic gonadotropin test result obtained after discharge.

Discussion

The incidence of placenta accreta increases with the increase in the number of previous cesarean deliveries [13], and the number of cases of placenta percreta most likely increases as the number of cases of placenta accreta increases. Placenta percreta has an incidence of only 0.008% [14].

Although it is difficult to diagnose placenta accreta antenatally, an accurate diagnosis is one of the most important objectives for the successful management of maternal hemorrhage; and this can be achieved using magnetic resonance imaging and ultrasonography [15–18].

A transverse uterine fundal incision for the management of placenta accreta can effectively avoid an accidental incision into the placenta and consequently decrease the risk of heavy fetal and maternal hemorrhage [19, 20]. However, in these reports, the total number of cases involving placenta percreta was small, and few other reports have used this technique for placenta percreta. Nevertheless, we considered it a very useful technique for this condition. In our patient, the placenta covered the

entire anterior uterine wall. However, we could avoid an incision into the placenta, giving us time to strip the bladder from the uterus. If we had used a conventional method such as a vertical uterine incision, severe hemorrhage because of iatrogenic partial separation of the placenta may have occurred. These situations can easily lead to severe bladder injury or total cystectomy in the surgeon's blind haste to control the massive bleeding.

Urologic complications occur in approximately 72% (39 of 54 cases) of cesarean hysterectomies performed during placenta percreta cases [4]. Urologic complications include bladder lacerations 26% (24 of 54 cases), urinary fistulas 13%, gross hematuria 9%, ureteral transection 6%, and a small capacity bladder 4%. Another study reported that partial cystectomy (3 of 29 cases) or cystotomy (3 of 29 cases) are required for the treatment of placenta accreta and placenta percreta cases [21]. Therefore, the avoidance of severe bladder injury is of the utmost importance in cesarean hysterectomy for the management of placenta percreta. However, cesarean hysterectomy is extremely difficult, particularly when massive bleeding occurs, because the urgency of stopping the hemorrhage leaves little time to strip the bladder from the uterus. Some reports have suggested using supracervical cesarean hysterectomy for placenta percreta [10] to avoid severe bladder injury. However, supracervical hysterectomy may cause severe hemorrhage due to the large volume of placenta (approximately one-third of the total placenta) being amputated without ligation of the uterine artery and the parametrial vessels. In contrast, our method (Fig. 3A) likely reduced intraoperative hemorrhage because only approximately 5% of the placenta was retained, and the placenta was amputated after ligation of the uterine artery and parametrial vessels. In fact, in our case, we first opened the posterior vaginal wall and immediately clamped the parametrial vessels and uterine artery. After ligating these vessels, the bleeding from the placental site dramatically decreased.

Compared with supracervical hysterectomy, retrograde hysterectomy may pose a higher risk of ureteral injury because of the uncertainty regarding the location of the ureters. As a result of preoperative placement of the ureteral stent in our case, we could palpate the ureters to avoid ureteral injury when opening the vagina and clamping and ligating the uterine artery and parametrial vessels. We, therefore, recommend that, in case of potential life-threatening hemorrhage during retrograde hysterectomy, a ureteral stent should be placed preoperatively to minimize the risk of ureteral injury.

Numerous studies have reported various methods for the postpartum management of placenta percreta, including conservative management, uterine artery embolization,

balloon occlusion, uterine compression sutures, and cesarean hysterectomy [2, 3, 22–26]. Our patient experienced both preoperative and intraoperative vaginal bleeding and conservative management was not possible. We, therefore, performed a cesarean hysterectomy. While bleeding may be reduced with the use of the balloon occlusion technique [27], it was not used in our case because its safety has not yet been established.

In summary, we successfully managed a case of placenta percreta with bladder invasion complicated by life-threatening hemorrhage using a transverse uterine fundal incision and retrograde hysterectomy without cystectomy. We found the following four strategies to be particularly useful; (1) the placement of a transverse uterine fundal incision to minimize bleeding from the uterine incision; (2) use of the bladder-filling technique to avoid bladder injury by allowing visual discrimination between the anterior uterine wall and the bladder [8]; (3) placement of an ureteral stent to facilitate palpation of the ureters, thus minimizing ureteral injury risk; and (4) performing a retrograde hysterectomy, even if life-threatening hemorrhage occurs during hysterectomy. Finally, retrograde hysterectomy and placental amputation should be performed to avoid severe bladder injury and to dramatically reduce hemorrhage.

Acknowledgments

We thank A. Yagi and K. Sakiyama for secretarial assistance.

Conflict of Interests

None declared.

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