

# Perioperative management of undiagnosed placenta percreta: case report and management strategies

Chitra Sivasankar

Department of Anesthesiology,  
Guthrie Clinic, Sayre, PA, USA

**Abstract:** Placenta percreta is a rare pregnancy disorder in which the placenta penetrates the uterine myometrium and can invade surrounding organs. Because the rate of cesarean sections is increasing in developed countries, the incidence of placenta percreta is also rising. This condition significantly increases the risk of maternal and fetal morbidity and mortality, and is currently the most common indication for peripartum hysterectomy. Multidisciplinary management in a specialized center capable of providing massive transfusions can improve outcomes for the mother and baby. This team should include a surgeon specialized in pelvic surgery, an anesthesiologist experienced in obstetrics, a skilled urologist, a neonatologist, a blood bank team capable of administering multiple blood products, and an intensive care facility where the patient can be monitored. In this report, we present the case of a patient with preoperatively undiagnosed placenta percreta and discuss the relevant management methods. We also discuss the relevant obstetric and anesthetic management methods, as well as diagnostic and transfusion protocols.

**Keywords:** adherent placenta, accreta, peripartum hysterectomy, post-partum hemorrhage

## Introduction

Adherent placenta accounts for 7%–10% of maternal mortality cases worldwide.<sup>1</sup> Placenta percreta is a rare type of adherent placenta that, when not diagnosed early, can lead to severe maternal morbidity. Previous cesarean section and intrauterine surgery are the most common risk factors for adherent placenta and placenta percreta. A recent study showed that the cesarean section rate has risen in the US from 5.5% in the 1970s to 32.8% in 2010.<sup>2</sup> If cesarean section rates continue to rise at the current rate, more than 50% of all deliveries in the US are estimated to be performed by cesarean section by 2020. This could result in more than 6000 cases of placenta previa, 4500 cases of placenta accreta, and 130 maternal deaths annually.<sup>3</sup> Here, we present the case of a 33-year-old woman intraoperatively diagnosed with posterior placenta percreta. We also review the relevant literature regarding the management of morbidly adherent placenta.

## Case report

A 33-year-old woman (gravida 5, para 2) was admitted to our hospital for her third elective cesarean section and tubal ligation at 39 weeks' gestation. She underwent ultrasonography during pregnancy to rule out a low-lying or adherent placenta, but the scan did not show any signs of an abnormal placenta. Because she had received spinal anesthesia for her previous cesarean sections, this surgery was also planned with

Correspondence: Chitra Sivasankar  
Dept of Anesthesiology, Guthrie Clinic,  
Sayre, PA 14440, USA  
Tel +1 570 887 5583  
Fax +1 570 887 4464  
Email schitra12@hotmail.com

spinal anesthesia. After delivery of a healthy male baby, the surgeon was unable to separate the placenta because it was penetrating the uterus and attached to the bladder.

General anesthesia was induced to provide better muscle relaxation and to improve patient comfort. Two large-bore intravenous lines and a radial arterial line were established in anticipation of severe hemorrhage. The surgeon performed a cystotomy of the dome of the bladder to separate the placenta, after which hysterectomy was undertaken, with repair of the dome of the bladder.

During the surgery, the patient lost 4000 mL of blood and developed severe hemodynamic instability, with a 20%–30% decrease in systolic blood pressure. A massive transfusion protocol was initiated. The patient was managed with vasopressors, blood products, and fluid replacement. She also developed hypocalcemia, which was treated with slow intravenous calcium chloride. Postoperatively, she was transferred to the intensive care unit and intubated for monitoring. She was extubated the next day and discharged 6 days later.

## Discussion

### Adherent placenta

The risk of abnormal implantation of the placenta is known to increase with increasing number of repeat cesarean sections.<sup>4</sup> Such abnormalities include low-lying placenta previa as well as placenta accreta. Adherent placenta encompasses a spectrum of abnormal placentation in which defects in the decidua basalis cause the placenta to adhere to or invade the myometrium. In these cases, there is no clear plane of cleavage between the placenta and the uterus. The incidence of abnormal placentation has increased from one in 2500 in the 1970s and 1980s to one in 533 in 2000.<sup>5</sup> The three types of adherent placenta include: accreta, in which the placenta is only adherent to the myometrium; increta, in which the placenta invades the myometrium; and percreta, in which the placenta penetrates the myometrium and attaches to other intra-abdominal organs.<sup>5</sup> Placenta percreta can lead to bowel injury, bladder injury, life-threatening hemorrhage, coagulopathy, amniotic fluid embolism, and peripartum hysterectomy. It has been associated with a maternal morbidity rate of 9.5% and a perinatal mortality of 24%.<sup>7</sup> The incidence of accreta is 0.1 to 2.3 per 1000 births, while the incidence of percreta is 0.03 per 1000 births.<sup>7</sup> The incidence of peripartum hysterectomy is quoted as 0.24–1.4 per 1000 births. Adherent placenta as a major indication for peripartum hysterectomy has risen from 5.4% to 46.5% over the last four decades.<sup>6</sup>

## Diagnosis

A diagnosis of placenta percreta is made in high-risk patients using ultrasonography and/or magnetic resonance imaging (MRI). Ultrasonography findings of accreta and percreta include loss of myometrial interface, retroplacental clear space, reduced myometrial thickness, turbulent placental lacunar flow, intraplacental lacunae, and an irregular bladder wall. Placental bulging or invasion into the bladder is also often seen. MRI is more accurate in diagnosing a posterior placenta, placenta percreta, and for imaging morbidly obese patients.<sup>8</sup> In 2012, the National Institute for Health and Clinical Excellence in the UK reported that MRI is more accurate at identifying adherent placenta than ultrasonography.<sup>9</sup> Features of placenta percreta on nonenhanced MRI include loss of myometrium overlying the placenta, placental tissue extending to the bladder, heterogeneous signal intensity in the placenta, focal areas of uterine bulging, and loss of interface with adjacent organs.<sup>10</sup> Although our patient underwent multiple prenatal ultrasonography examinations, none showed an adherent or low-lying placenta, so she did not undergo MRI.

## Obstetric management

Optimum management of placenta percreta requires early detection and a planned cesarean hysterectomy, ideally at about 34–36 weeks. Antenatal supplementation with oral iron can maximize iron stores and improve the oxygen-carrying capacity of blood. In a selected group of patients, erythropoietin injections and/or simultaneous parenteral iron infusions may be needed preoperatively.<sup>14</sup> A multidisciplinary approach by a team of experienced obstetricians, anesthesiologists, nurses, interventional radiologists, neonatologists, and urologists, as well as a blood bank, ensures the best outcomes.<sup>11</sup> Women with any type of adherent placenta should be treated at a specialist center. Identifying the extent of infiltration by the placenta and performing preoperative placement of bilateral iliac artery balloon catheters to be inflated after delivery can considerably reduce the bleeding.<sup>12</sup> Preoperative placement of ureteral stents can help identify the ureters, allowing more rapid completion of the hysterectomy.<sup>13</sup>

## Anesthetic management

Anesthetic management requires meticulous preoperative planning.<sup>14</sup> Important management factors include the following: optimization of hemoglobin, adequate intravenous access, availability of rapid infusers, hemodynamic monitoring (including central venous and peripheral arterial

access), use of a cell saver, rapid availability of blood products, compression stockings, padding and positioning to prevent nerve compression, and avoidance and treatment of hypothermia.

Regional or general anesthesia can be used depending on anticipated blood loss and extent of the percreta and duration of the procedure. Regional anesthesia can provide better postoperative pain control, reduce the risk of aspiration, reduce bleeding, allow for better mother–baby bonding, and decrease fetal exposure to drugs.<sup>15,16</sup> Disadvantages include the risk of hemodynamic instability. In addition, the simultaneous management of a potentially difficult airway during the surgery is clearly an undesirable situation.

General anesthesia allows for better control of ventilation as well as better hemodynamic stability in the event of massive hemorrhage. The duration of hysterectomy is much longer than for cesarean section, leading to patient restlessness, and pulling and traction on the viscera can often lead to pain, nausea, and vomiting. Also, hyperemic pelvic viscera require careful dissection with a quiet operative field and good muscle relaxation. A study by Chestnut et al showed that elective cesarean hysterectomy is not a contraindication to continuous epidural anesthesia.<sup>17</sup>

Placenta accreta and increta are usually perfused by uterine vessels, so clamping of uterine artery can control massive bleeding. However, placenta percreta may be perfused by extrauterine vessels,<sup>16</sup> so there is a risk of severe bleeding. Such bleeding cannot be controlled by uterine artery ligation. This, together with the need for prolonged surgery and muscle relaxation, makes general anesthesia a better option than regional anesthesia.

## Transfusion recommendations

A recent case series report found that more than 10 units of packed red cells were needed in 65% of patients diagnosed with adherent placenta.<sup>18</sup> Therefore, immediate access to blood products in the operating room is vital when performing a cesarean section on patients with this condition, and early communication with the blood bank is paramount. Implementation of a massive transfusion protocol that ensures ongoing availability of blood products until bleeding can be controlled may be life-saving in the case of severe hemorrhage. Experience in the trauma field shows that transfusion of packed red cells, fresh frozen plasma, and platelets in a 1:1:1 ratio improves outcomes; however, there are no comparable data in pregnancy.

Intraoperative blood salvage (cell saving) has been advocated by the American College of Obstetrics and

Gynecology for women in whom massive hemorrhage is anticipated, such as those with placenta accreta. The American Society of Anesthesiologists has recommended that cell savers should be considered, if available, “in cases of intractable hemorrhage when banked blood is not available or the patient refuses banked blood”. A theoretical concern about cell saver use is the possibility of amniotic fluid embolism. However, there are more than 390 case reports in which blood contaminated with amniotic fluid has been washed and readministered without filtration.<sup>19</sup>

Recombinant factor VIIa has been used off-label to treat severe postpartum hemorrhages with positive results.<sup>20</sup> Many case reports suggest the use of 90 µg/kg, but the ideal dosage has not yet been determined. It should be used with caution because of the potential risk of vascular thrombosis, and patients receiving this should also receive thromboprophylaxis. Its use is supported by level 4 and 5 evidence and is recommended by the European Society of Anesthesiology.<sup>16</sup>

## Summary

Early recognition of an adherent placenta and multidisciplinary management are important in improving the clinical outcomes of patients with placenta percreta. With a rising rate of cesarean sections, the risk of placenta accreta and percreta are increasing as well. Obstetricians and clinicians should be vigilant in the diagnosis of adherent placenta, even when ultrasonography results are negative. Whereas ultrasonography is useful in screening for low-lying and adherent placenta, MRI should be used for at-risk patients to identify placental location accurately, regardless of the ultrasonography findings. Management of placenta percreta by a multidisciplinary team in a hospital capable of providing massive transfusions is vital in reducing the morbidity and mortality associated with this condition.

## Disclosure

The author reports no conflicts of interest in this work.

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