ISSN: 3029-0910

Review Article

Journal of Gynecological & Obstetrical Research

Comparison of Two Different Anesthetic Managements for Two Surgical Approaches in Placenta Percreta

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Received: May 20, 2025; **Accepted:** May 29, 2025; **Published:** June 03, 2025

ABSTRACT

Placenta accreta spectrum is a serious gynecological condition that is associated with increased maternal morbidity and mortality. The main causes of increased morbidity and mortality are intrapartum and postpartum hemorrhage. The goal of definitive treatment for placenta previa is surgery. There are two main surgical approaches that can be used: cesarean hysterectomy or cesarean section with delayed hysterectomy. Anesthetic management depends on the chosen surgical approach, the degree of placental invasion, and the hemodynamic stability of the patient. In this report we examine the cases of two women with PAS each treated with a different surgical approach. Our aim is to demonstrate how each approach affected the patients' hemodynamic stability, blood loss, clinical outcomes and differences in anesthetic management. Furthermore, we demonstrated the importance of involving a multidisciplinary team and development of a clear surgical plan.

Keywords: Placenta Accreta Spectrum, Placenta Percreta, Cesarean Hysterectomy, Anesthetic Management

Introduction

Placenta accreta spectrum (PAS) is a serious gynecological condition. Placenta percreta is the most severe form of PAS, occurring in less than 10% of all cases. In placenta percreta chorionic villi penetrate through the myometrium and the serosa of the uterus, potentially also invading adjacent organs, such as the urinary bladder. It is associated with increased maternal morbidity and mortality. Significant risk factors for the development of PAS are prior uterine surgery and curettage, advanced maternal age, placenta previa and previous cesarean deliveries. The goal of definitive treatment for placenta previa is usually cesarean hysterectomy, however a more conservative approach of performing the hysterectomy in a later procedure has been favored lately. There are no clear and validated guidelines regarding which surgical approach should be used to treat patients with PAS. The choice of approach depends on the hemodynamic stability of the pregnant woman, the degree of placental invasion, the desire to preserve fertility, previous uterine surgeries, availability of medical resources, and experience of the surgical team. Most authors recommend hysterectomy with the placenta left in situ (regardless of chosen surgical approach). A conservative approach with uterine preservation is applied in women who wish to preserve fertility and when immediate hysterectomy is considered to have an unacceptably high risk of bleeding or injury to other organs. In cases with clearly diagnosed placenta percreta, delayed hysterectomy may be considered 4-6 weeks after delivery, but it is generally not recommended due to an insufficient number of cases [1]. Anesthetic management depends on the chosen surgical approach, the degree of placental invasion, and the hemodynamic stability of the patient [2].

Objective

In this report we examined the use of two different surgical approaches in women with diagnosed PAS. Our aim was to demonstrate how each approach affected the patients' hemodynamic stability, blood loss and the clinical outcome. Furthermore, we observe the importance of involving a multidisciplinary team and development of a clear surgical plan due to the unpredictable nature of PAS. Our hypothesis was that

Citation: Maja Pesic, Katarina Klican- Jaic, Zoya Jelovecki-Dokic, Marinko Vucic, Krunoslav Kuna. Comparison of Two Different Anesthetic Managements for Two Surgical Approaches in Placenta Percreta. J Gyneco Obstet Res. 2025. 3(2): 1-4. DOI: doi.org/10.61440/JGOR.2025.v3.34

delayed hysterectomy leads to better hemodynamic stability with less blood loss, a reduced need for transfusion of blood and blood products, and yields good outcomes for both mother and child.

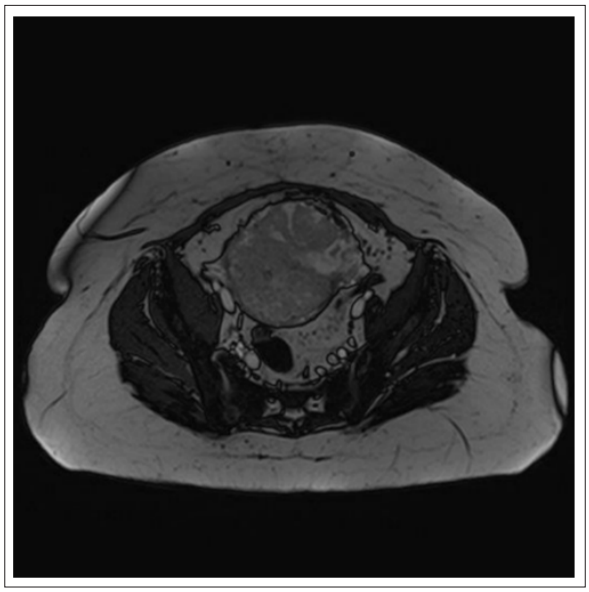

Figure 1: Magnetic resonance imaging (MRI) showing complete placenta percreta which has reached muscles of the anterior abdominal wall.

Materials and Methods

We present the cases of two pregnant women who were diagnosed with placenta previa with placenta percreta via magnetic resonance imaging (MRI) and ultrasound findings (Figure 1). Both women had two previous cesarean deliveries. In the first case, PAS was detected at 23 weeks of gestation. The patient was hospitalized at 30 weeks gestation for monitoring and planned delivery. The pregnancy was terminated prematurely via cesarean section due to recurrent vaginal bleeding that was initially controlled with intravenous tocolysis. The multidisciplinary team (gynecologist, anesthesiologist, urologist, radiologist) concluded that due to the extensive placental invasion, immediate hysterectomy could lead to significant blood loss and severe bladder injury. A decision for a more conservative surgical approach was made; preserving the uterus and planning a delayed hysterectomy 4-6 weeks later. Preoperatively, rapid neuroprotection with magnesium was performed and tranexamic acid (1 g IV) was administered. Under general endotracheal anesthesia, at 32 weeks and 2 days of pregnancy, a live female baby was born (2100 g and 45 cm, Apgar scores of 5, 7, and 9). During the operation, extensive invasive monitoring (arterial blood pressure measurement (ABP) and central venous catheter (CVC)) was performed alongside standard monitoring (ECG, SpO2, urinary catheter). Before the operation, catheterization of the internal iliac arteries was performed and after delivery both internal iliac arteries were temporarily embolized. Due to a deterioration of the patient's condition (suspected sepsis) and newly discovered pneumonia, a second surgical procedure (hysterectomy with bilateral salpingectomy) was performed only two days after the cesarean delivery. Following both procedures, the patient was hospitalized in the intensive care unit for a short period of time. The postoperative hospital recovery lasted 2 weeks and proceeded without complications.

In the second case, PAS was also detected at 23 weeks of gestation, and the patient was hospitalized at 25 weeks of gestation due to profuse vaginal bleeding and need for further monitoring. During hospitalization, corticosteroids were administered to stimulate fetal lung maturation. Intravenous tocolysis and constant monitoring of laboratory results was also performed. A rise in inflammatory markers led to introduction of intravenous antibiotics, initially lab values improved. However, at 30 weeks gestation due to a renewed rise in inflammatory parameters despite antibiotic therapy, invasive placentation with acute pain, and continuous intravenous tocolysis, the multidisciplinary team decided to end the pregnancy via emergency cesarean hysterectomy. Preoperatively, 1 g of intravenous tranexamic acid was administered, and a cesarean hysterectomy was performed under general endotracheal anesthesia. During the operation, extensive invasive monitoring (ABP and CVC) was performed alongside standard monitoring. A live premature female baby was born (1575 g and 42 cm, Apgar scores of 8, 9, and 9). The procedure was complicated by a bladder lesion and hemorrhagic shock due to bleeding from numerous aberrant blood vessels, supracervical hysterectomy, and bleeding from the parametrium. At the end of the procedure, the mother was transferred to the intensive care unit and on the third postoperative day she was moved to the ward. The mother was discharged home 2 weeks after the cesarean section.

Table 1: Patients' pre and post operative laboratory values

Case 1	
Pre-operative Lab values	**Post-operative Lab Values**
Hemoglobin 121 g/L	Hemoglobin 121 g/L
Hematocrit 0.353 L/L	Hematocrit 0.326 L/L
Platelets 180X109/L	Platelets 82 x 109/L
Fibrinogen 6.3 g/L	Fibrinogen 4.7 g/L
Prothrombin Time >138%	Prothrombin time 106%,
INR 0.8	INR 1.0
Case 2	
Pre-operative Lab values	Post-operative Lab Values
Hemoglobin 100 g/L	Hemoglobin 119 g/L
Hematocrit 0.298 L/L	Hematocrit 0.365 L/L
Platelets 190X109/L	Platelets 239X109/L
Fibrinogen 3.2 g/L	Fibrinogen 3.2 g/L
Prothrombin Time 132%	Prothrombin Time 111%
INR 0.8	INR 1.0

Table 2: Blood products transfused during different surgical approaches

Blood Products Cesarean Section	**Blood Products Hysterectomy**	**Blood Products Received in Cesarean Hysterectomy**
CE 5 doses	CE 9 doses	CE 10 doses + 6 doses Platelets
FFP 4 doses	FFP 3 doses + Fibrinogen 4 grams	FFP 4 doses + 4 g Fibrinogen

The results of our findings are presented in the tales below. Table 1 compares pre-operative and post-operative lab values. Table 2 compares the amount of blood products that were transfused during each respective surgery.

Discussion

Most pregnant women with placenta accreta spectrum (PAS) syndrome are only diagnosed immediately before delivery. Due to insufficient preparation in such cases unfavorable outcomes for both mother and child can occur. In this report, PAS was diagnosed in the second trimester in both pregnant women, providing enough time for proper preparation and timing of delivery the pregnancy [3]. Since there are no clear guidelines for the treatment of these pregnancies, it is extremely important to develop a good preoperative plan for managing women with PAS. When prenatal diagnosis of PAS is definitively confirmed based on radiological examinations and risk factors such as placental implantation at the site of previous uterine surgery, most authors recommend cesarean section leaving the placenta in situ. This approach reduces blood loss and related complications [4-8]. Recently, a more conservative approach has been increasing in use, especially in patients who wish to preserve fertility, for cases of focal placental percreta, and when there is a high risk of bleeding or injury to other organs when performing hysterectomy, as was the case in our first patient [3,9]. Hysterectomy in the second stage was planned to be performed within 4-6 weeks. Experience with conservative treatment is limited. Conservative management is associated with less need for transfusions and better hemodynamic stability [10-12]. The value of endovascular intervention is controversial. In a large meta-analysis of endovascular procedures performed before surgery in over 950 pregnancies with PAS, the surgical procedure was associated with less blood loss and a reduced need for transfusion [13]. In the second case, a cesarean section was performed at 30 weeks of pregnancy, followed immediately by hysterectomy due to increased inflammatory parameters despite antibiotic therapy, invasive placentation with acute pain, and ongoing need for intravenous tocolysis [6]. The procedure was complicated by bladder injury and hemorrhagic shock. Both are well-defined complications of performing cesarean hysterectomy and are described in current literature.

In our case, comparison of the two different surgical approaches did not support our hypothesis that conservative management would result in less blood loss and diminished need for transfusion [14]. The woman treated with conservative surgical management underwent hysterectomy much earlier than initially planned. This is a potentially resulted in the need for larger amounts of blood products. The postoperative course for both patients was similar, with short stays in intensive care units and both patients being discharged home in two weeks. Similarly, the clinical status and APGAR scores of the newborns were comparable.

Conclusions

With this report, we aim to highlight the importance of a multidisciplinary team approach and clearly planned surgical intervention, as well as the unpredictability of outcomes in women with PAS. Despite a timely diagnosis, involvement of a multidisciplinary team, and a clear surgical plan, in our case, hysterectomy done in a second surgical procedure requires the same anesthetic involvement and patient care as cesarean hysterectomy. Immediate hysterectomy is safer in situations where there is uncontrolled bleeding, but it carries a higher risk of operative complications. It is of great importance to preoperatively develop a plan for managing pregnant women with placenta percreta to reduce the risk of massive postpartum hemorrhage, morbidity and potential mortality.

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