

## CASE REPORT

## REGIONAL ANESTHESIA

# Epidural anesthesia in a patient with placenta accreta for intra-aortic ballooning and cesarean section

**RTH Suprptomo****Author affiliation:**

Department of Anesthesiology & Intensive Therapy, Faculty of Medicine, Sebelas Maret University, / RSUD Dr. Moewardi Surakarta, Indonesia.

**Correspondence:** RTH Suprptomo; **E-mail:** [rth.suprptomo@gmail.com](mailto:rth.suprptomo@gmail.com); **Phone:** +62 822-5220-1075

## ABSTRACT

Postpartum hemorrhage (PPH) is one of the main causes of maternal death besides cardiovascular disease. Among the causes of PPH is placenta accreta. Hysterectomy is usually performed in placenta accreta to save the mother's life. However, hysterectomy has a direct impact on fertility so that a new strategy was developed, namely the use of prophylaxis Intra-abdominal Aortic Balloon Occlusion (IABO). Anesthetic management plays an important role in ensuring the safety of placenta accreta patients.

We present a case of a 34-year-old woman G3P1A1 38+3 weeks with a history of antepartum hemorrhage, complete placenta previa with moderate risk morbidly adherent placenta (MAP), oblique breech position, oligohydramnios, intrauterine growth restriction (IUGR), and previous cesarean section (CS) 4 y ago. She was ASA-II and planned cystoscopy and ureteral catheter insertion by a urologist. The *aortic ballooning angioplasty* was done through inguinal area by a cardiothoracic surgeon. Followed by CS for 120 minutes, and duration of arterial blockade that can be maintained for 20 min during CS. The operation was performed using epidural anesthesia. Induction with an initial epidural dose was carried out using levobupivacaine 0.5% 15 ml in 5 ml increments every 5 min.

Placenta accreta can cause massive bleeding, disseminated intravascular coagulation (DIC), and damage to the liver and kidneys. Massive bleeding caused by placenta accreta significantly increases maternal morbidity and mortality. The latest technology called Intra-abdominal Aortic Balloon Occlusion (IABO) is an option to reduce bleeding and the need for transfusions during and after surgery. Epidural anesthesia is considered a favorable anesthetic option for these patients, as it can also be used as a good postoperative analgesia.

**Key words:** Placenta Accreta; Intra-abdominal Aortic Balloon Occlusion; Epidural anesthesia

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## 1. INTRODUCTION

Postpartum hemorrhage (PPH) is one of the main causes of maternal death besides cardiovascular disease. Among the causes of PPH is placenta accreta. The incidence of placenta accreta increases with the increased frequency of cesarean sections (CS).<sup>1</sup> Placenta accreta is an obstetric complication that can cause maternal morbidity and mortality. Reported morbidity rate is 60% with a mortality of 7%.<sup>2</sup>

Based on several studies, a history of CS and placenta previa are risk factors that are often found in patients with placenta accreta, while other risk factors are still

not known to contribute to placenta accreta. Diagnosis can be made through ultrasonography (USG) with a sensitivity of 77-87% and a specificity of 96-98%.<sup>3</sup> Placenta Accreta Index (PAI) is a predictor for estimating the probability of placenta accreta occurring with ultrasound examination parameters, namely history of CS  $\geq 2$  times, lacunae, myometrial thickness, anterior placenta previa, and bridging vessels. The higher the PAI score, the higher the chance that the mother will experience placenta accreta.<sup>4</sup>

Placenta accreta can cause bleeding, both intrapartum

and postpartum. Hysterectomy is usually performed in placenta accreta to save the mother's life. However, hysterectomy has a direct impact on fertility so that a new strategy has been developed, namely the use of prophylaxis intra-abdominal aortic balloon occlusion (IABO) in patients with placenta accreta and has been applied in the recent years in parturients in which hysterectomy needs to be avoided. In this technique, the operator inserts a balloon catheter into the lower segment of the abdominal aorta from the femoral artery. After the fetus is born and the umbilical cord is clamped, the balloon is immediately inflated using sterile saline to temporarily block circulation to the uterus, so that bleeding can be minimized when the doctor removes the placenta and sutures the uterus.<sup>5</sup>

Anesthetic management plays an important role in ensuring the safety of placenta accreta patients. In pregnant women, physiological changes occur that can affect anesthetic technique and administration of other drugs. The anesthetic technique used in cases of placenta accreta greatly determines the maternal and neonatal outcome. It is important for the anesthesiologist to consider the effect of anesthesia on hemodynamics and bleeding conditions; especially in patients with placenta accreta. Postoperative care is needed to evaluate complications that can arise including damage to various organs, disseminated intravascular coagulation (DIC), massive bleeding and need of massive transfusion, postoperative thromboembolism, and infection to death.<sup>6</sup>

## 2. CASE REPORT

A G3P1A1 Uk 38<sup>+3</sup> week complained of bleeding spots for 3 days. Fetal movements were still active. There was no amniotic fluid leakage, nor any complaint of bloody mucus from the birth canal. History of previous bleeding was positive. There was no h/o abdominal pain, cramps, fever, cold cough, shortness of breath, or chest pain. The patient had a history of curettage in 2016, and a history of CS for breech position in 2017.

### 2.1. Physical examination

On physical examination, the general condition of the patient was moderate and fully conscious. On examination of vital signs, blood pressure was 130/80 mmHg, heart rate was 81 beats/min, respiration rate 20 breaths/min, and body temperature 36.6°C. Patient's height was 160 cm, and weight before pregnancy was 75 kg.

On general physical examination, the patient did not appear cyanotic, examination of the head, eyes, nose, ears, mouth, throat was within normal limits, there were no enlarged lymph nodes. On thoracic examination, regular heart sounds I and II and normal chest were

noted. On abdominal examination, there was a distended gravid abdomen, gestational age 38 weeks, supple, palpable intrauterine single fetus, transverse position (head to right, back up), fetal heart rate 145 beats/min.

### 2.2. Investigations

The results of the patient's complete blood and urine laboratory tests are presented in Table 1.

**Table 1: Laboratory examination results**

Inspection	Results	Reference
Hemoglobin (g/dl)	18,3	12.0 – 15.6
Hematocrit (%)	39	35 – 45
Platelets (103 $\mu$ L)	283	150 – 450
PT (sec)	11.8	10.0 – 15.0
APTT (sec)	28.5	20.0 – 40.0
INR	0.9	0.85 – 1.15
GDS (mg/dl)	78	60-140
SGOT	15	<31
SGPT	8	<34
Urea (mg/dl)	10	<50
Creatinine (mg/dl)	0.7	0.6 – 1.1
Albumin (g/dl)	3.8	3.5 – 5.2
Sodium (mmol/L)	143	136 – 145
Potassium (mmol/L)	3.9	3.3 – 5.1

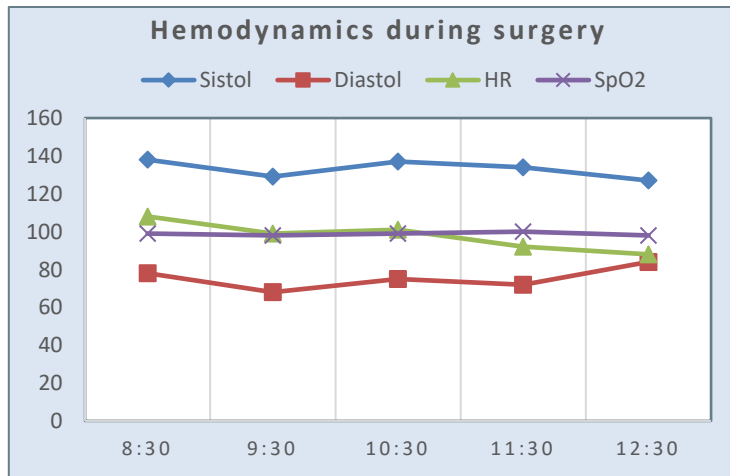
On CTG examination, the uterine contractions were negative, and fetal movement was adequate.

### 2.3. Anesthesia management

The patient came with a diagnosis of placenta accreta. She was given 200 ml of crystalloid fluid. At 08.00 the patient was positioned sitting then the puncture area was identified at L2-L3. Under aseptic technique an epidural catheter was placed at L2-L3. After confirming the position of the catheter in the epidural space, the patient was positioned supine again. Induction with an initial epidural dose was carried out using 0.5% levobupivacaine volume 15 ml in 5 ml increments every 5 min while hemodynamic monitoring was carried out.

At 08.30-09.00 the patient was positioned for lithotomy for cystoscopy and placement of a ureteral catheter by a urologist. Then proceed with the preparation for the installation of an intra-aortic balloon catheter at 09.15-10.30, the patient was positioned supine again for insertion of aortic balloon angioplasty through inguinal approach.

At 10.30 IABO was installed, followed by a CS, and the



Graph 1: Hemodynamic data during operation

arterial blockade was maintained for 20 min during the CS.

During the operation, the patient received injection of paracetamol 1 gram intravenously, tranexamic acid 1 gram intravenously, oxytocin 20 IU drip, heparin 5000 i.u, and was sedated using midazolam 2 mg. The patient was stable during the operation which lasted for 4 h with heart rate 115 per min, blood pressure 138/78 mmHg, and SpO<sub>2</sub> 100%. Blood loss was estimated to be 1,300 ml. A baby girl was born per abdomen in the 3rd minute with an APGAR score of 8-9-10 BBL weighing 2300 grams. The patient received postoperative epidural analgesia in the form of 0.125% levobupivacaine plus morphine 300 µg continuously at a speed of 2 ml/h. The patient was then transferred to the HCU for intensive monitoring.

### 3. DISCUSSION

Placenta accreta is a disorder in which the placental villi invade the myometrium due to dysplasia of the decidual basalis cells or due to a traumatic defect. Placenta accreta can cause massive bleeding, disseminated intravascular coagulation (DIC), and damage to the liver and/or kidneys. Massive bleeding caused by placenta accreta significantly increases maternal morbidity and mortality. A history of previous CS or other uterine surgery can increase the incidence of placenta accreta. The presence of a placenta covering the birth canal and an ultrasound examination, will increase the risk of bleeding.<sup>6,7</sup> The latest technology called intra-abdominal aortic balloon occlusion (IABO) is an option to reduce bleeding and reduce the need for transfusions during and after surgery. Not only that, anesthetic management plays an important role in ensuring the safety of the mother and baby in patients with placenta accreta, while maintaining good blood flow to the placenta.<sup>5,8</sup> Epidural

anesthesia is considered a favorable anesthetic option for these patients, as it can also be used as a good postoperative analgesia. Patients with placenta accreta, who received general anesthesia, tended to experience more blood loss and required more transfusions and also a longer operating time.<sup>9,10</sup>

Our patient was diagnosed with placenta previa from an ultrasound examination and had a 33% probability of having placenta accreta based on the parameters of the Placenta Accreta Index (PAI) (Table 2). The patient was planned for a CS by the obstetric department. Later on, cardiothoracic surgery section decided to perform IABO during surgery after a previously planned hysterectomy. The use of IABO was able to prevent complications caused by uncontrolled bleeding after manual removal of the placenta compared to the group that did not use IABO, a number of cases of hemorrhagic shock were also reported in the non-IABO group. The cardiothoracic surgeon inserted a balloon catheter into the lower segment of the abdominal aorta via the right femoral artery. After the fetus was born and the umbilical cord was clamped, the balloon was immediately inflated to block blood flow to the uterus while the placenta was taken out while the uterus was sewn. The process of releasing the balloon also needs to be considered by the anesthesiologist where the blood flow which was initially blocked will now flow back to

Table 2: Placenta accreta index.

Parameters	Score/ value
< 2 Cesarean deliveries	0
≥ 2 Cesarean deliveries	3.0
<b>Placental lacunae</b>	
Grade 3	3.5
Grade 2	1.0
Grade 1	0
<b>Smallest myometrial thickness</b>	
≤ 1mm	1.0
< 1 and ≥3mm	0.5
> 3 and ≤5mm	0.25
Anterior placenta previa	1.0
Bridging vessels (visible on color Doppler at uterine-bladder interface)	0.5

Source: Rac MW. Placenta Accreta Index. Am J Obstet Gynecol 2014.

the lower extremities so the process of deflating the balloon is carried out gradually accompanied by monitoring the patient's hemodynamics, to maintain a stable return flow. Vasoconstrictors drugs can also be given to increase systemic vascular resistance. The important thing to note in this procedure is the potential for ischemic risk in the lower extremities, aortic rupture, the potential for plaque embolization from the distal blood vessels, to the difficulty in loosening and removing the balloon and the catheter. Therefore, it is necessary to pay attention to the time limit for placing the balloon. Several studies have recommended that the safe time limit for this surgical technique is 45-60 min. If there is high risk of lower extremity ischemia, some recent studies recommend to limit the time for no more than 40 min, after which the balloon is deflated for approximately 10 min to prevent ischemia in the extremities.

The choice of anesthesia in a pregnant patient with suspected placenta previa accreta is determined by many factors. Among them are comorbidities, presence/absence of coagulation disorders, condition of the fetus, and the risk of massive bleeding, hemodynamic instability, and the presence/absence of pre-eclampsia. In these patients' epidural anesthesia is chosen with the following considerations: epidural anesthesia is associated with a lower risk of blood loss than GA, a lower incidence of postoperative thrombosis, no risk of failed intubation and aspiration, and better postoperative analgesia.

## 4. CONCLUSION

Management of patients diagnosed with placenta accreta requires good preparation. Full cooperation in between several involved specialists, including anesthetists, obstetricians, urologists, vascular intervention experts can reduce the problem of massive bleeding that threatens during and after surgery. The risk of bleeding is an important factor, and intra-abdominal aortic balloon occlusion can be an option to reduce the risk of bleeding in patients with placenta accreta. The choice of epidural anesthesia, if there are no contraindications, has much merit because it has many advantages, especially for postoperative analgesia.

### 5. Conflict of interest

None declared by the author.

### 6. Authors contribution

RTH Supraptomo has been the sole author of this case report.

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