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Anesthesia for cesarean hysterectomy in a patient with placenta percreta: A case report

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We report a case of 34 years old healthy pregnant female scheduled for elective cesarean hysterectomy due to previous cesarean section with placenta previa totalis and suspected placenta accrete with transverse lie. We anesthetized this patient with regional anesthesia in combination with general anesthesia due to regional anesthesia wore off. Massive bleeding during the operation was resuscitated. Co-ordination within the teamwork is necessary. At end of the operation, the mother and her newborn were safe without significant complication.

Keywords: *Anesthesia, Placenta previa totalis, Cesarean hysterectomy.*

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พรรรัตน์ จินดา, แก้ว สุภรสุข. การให้ยาระงับความรู้สึกในผู้ป่วยตั้งครรภ์ที่มีภาวะรกเกาะติดผนังโพรงมดลูกเข้ามารับการผ่าตัดคลอดบุตรพร้อมกับตัดมดลูก: รายงานผู้ป่วย 1 ราย. จุฬาลงกรณ์เวชสาร 2553 ม.ค.- ก.พ.; 54(1): 57 - 66

รายงานผู้ป่วยหญิงตั้งครรภ์อายุ 34 ปี มาด้วยนัดมาทำการผ่าตัดคลอดบุตร โดยมีประวัติผ่าตัดคลอดบุตรมาก่อนและในครรภ์นี้ได้รับการวินิจฉัยว่ามีภาวะรกเกาะต่ำ ซึ่งอาจจะมีภาวะผิดปกติของรกที่เกาะแน่นกับโพรงมดลูกได้รวมทั้งทารกในครรภ์อยู่ในท่าขวาง โดยในผู้ป่วยรายนี้ได้รับการระงับความรู้สึกเฉพาะส่วนแก่ผู้ป่วยผ่านทางช่องไขสันหลังก่อน จากนั้นได้ให้การดมยาระงับความรู้สึกกับผู้ป่วยต่อเนื่องจากการระงับความรู้สึกเฉพาะส่วนไม่เพียงพอ ระหว่างการทำผ่าตัดมีปัญหาเลือดออกมาซึ่งได้รับแก้ไขอย่างทันท่วงทีโดยอาศัยความร่วมมือ และประสานงานกันระหว่างทีมผ่าตัด ทีมวิสัญญี และบุคลากรอื่น ๆ โดยในที่สุดการผ่าตัดสำเร็จด้วยดี ทั้งมารดาและทารกไม่พบว่ามีภาวะแทรกซ้อนที่สำคัญแต่อย่างใด

คำสำคัญ : การระงับความรู้สึก, ภาวะรกเกาะต่ำที่ปิดปากมดลูกด้านในทั้งหมด, การตัดมดลูกจากข้อบ่งชี้ทางการคลอดบุตร.

Placenta percreta is a rare obstetrical condition. This condition increases the risk of intraoperative and postoperative maternal and fetal morbidity and mortality, secondary to hemorrhage, coagulopathy and infection.^(1 - 5) Risk factors of placenta previa compose of previous cesarean section, pregnancy termination, intrauterine surgery, smoking, multifetal gestation, multiple parity and maternal age.^(5 - 7) We present a case in which preoperative recognition of the pathology allowed a carefully constructed multidisciplinary team approach to anesthetic, surgical, and neonatal management.

Case Report

A case of G2P1 Thai healthy pregnant female, 34-year-old, came to King Chulalongkorn Memorial Hospital at 37 wks 4 days gestational ages with the appointment of elective cesarean section due to previous cesarean section with placenta previa totalis and suspected placenta accreta with transverse lie presentation.

There was no other significant past medical or surgical history, except Bellagoid allergy.

About past obstetrical history, first pregnancy, cesarean section was done due to unfavorable cervix with premature rupture of the membrane without other medication problems.

At 2nd trimester of this pregnancy, she was admitted in the private hospital due to pneumonia and that time she developed premature contraction, she received medications composed of intravenous antibiotic (ampicilin), Dexamethasone intramuscularly injection and ventolin per oral.

As she was referred from a private hospital to King Chulalongkorn Memorial Hospital due to status post pneumonia with premature contraction after

successfully inhibitory labor process and ultrasound suspected placenta accreta at gestational age 30 wks. Everything was all right and she was followed up by the antenatal care appointment program. After we received operative schedules from the Department of Obstetrics and Gynecology regarding this case, we went to see her for pre-operative evaluation. At this admission, her present history and physical examination were acceptable (BW 53.3 kg, Ht 156 cm, heart and lung - normal examination, fundal Height 3/4 above umbilicus, fetal heart sound 156 BPM), airway assessment (Mallampati class I, Thyromental distance > 5 cm, no limit range of motion of the neck). Routine laboratory investigations such as CBC, PT, PTT, INR were normal (Hct 31%, NST - reactive)

Transabdominal ultrasound was done, it revealed placenta previa totalis with interrupted myometrium at the anterior wall of the uterus with transverse presentation and presented with interrupted myometrium at the anterior wall of the uterus. Fetal heart sound was positive.

We discussed with the surgeon and planning of surgery was cesarean hysterectomy because: (1) the patient did not want to pregnant again; (2) cesarean hysterectomy was safer for her because it is easier to control bleeding by ligating the vascular supply of the uterus than conservative surgery. So the surgeon decided to make classical hysterotomy, with the placenta inside the uterus, ligating all the vessels feeding the uterus, and then perform hysterectomy.

On the other hand, we discussed with the patient and her husband. Both of them were informed about the surgery plan and prognosis that she had a risk to die peri-operation. Her will was to be conscious to see her baby during the operation.

We decided to choose regional anesthesia, not general anesthesia, to decrease the risk of aspiration, avoiding manipulated airway of patient that may be difficult. This would decrease the chance of uptake of anesthetic agents by intrauterine fetus and in response to the patient's willing to see her child during the operation and also we estimated that the operation would cause less blood loss and less time of surgery due to the surgical technique. Spinal anesthesia was chosen because spinal anesthesia's technique could be easier performed and faster than continuous epidural anesthesia, better intense of blockade, and opportunity of dural trauma less than continuous epidural anesthesia. However, we could not top-up any anesthetic agents with spinal anesthesia. So we prepared anesthetic induction agents that have less effect on cardiovascular system, if general anesthesia should be performed.

We prepared 4 units of packed red cells in the operative room (OR); 2 units for initial screening were available at blood bank. Neonatologists were standby, and the Intensive Care Unit was booked for post-operative close monitoring.

In anticipation of any possible need for massive transfusion, two sets of blood infusion sets were prepared and equipped with a blood warming system.

In the OR, the patient was positioned supine, under local anesthesia 16G and 18G intravenous catheters were placed in the left arm. Standard monitoring were started: non-invasive blood pressure, EKG monitor, oxygen saturation and urine output. Temperature was not monitored due to awake anesthesia and we did not monitor invasive monitoring because we thought can estimate blood loss from

the operative field, can adjust fluid administration and the patient still young and healthy that is the reason why we not monitor central venous pressure and invasive blood pressure.

Finally, the surgeon marked site placenta on the skin under ultrasound before cleansing the abdominal skin. After then spinal anesthesia was done with 0.5% heavy bupivacaine 2.2 ml with intrathecal morphine 0.2 mg into the lumbar space 3rd - 4th. Left paramedian approach was taken, the CSF was clear and flew freely, paresthesia T4 was done. Then, cesarean section was done with low midline incision with unanticipation of a lot of adhesion band. The surgeon began to lysis the adhesion and stop bleeding before he found out that the placenta was percreta, attached to the posterior wall of the bladder. Classical hysterotomy was done, a female baby was delivered in footling breech extraction and a neonatologist took care of her immediately with Apgar score 5, 9 and then took her to NICU in an incubator. The surgeon then started to suture all the layers of the uterus, ligating bilateral hypogastric arteries and did hysterectomy. There was no oxytocin used in this case. Between these procedures the patient's blood pressure suddenly dropped from Blood Pressure 153/61 mmHg Pulse Rate 105 BPM to Blood Pressure 45/32 mmHg PR 115 BPM while we thought intraoperative blood loss compared with fluid resuscitation enough. At that time we saw intraoperative field uterus size was rapidly enlarged like full-term uterus size compared to 20 weeks uterus size immediate after hysterotomy. Bleeding was concealed in all layer uterus. We started to give massive blood transfusion and fluid replacement until ligate all feeding vessels were ligated. The bleeding was stopped but because

of placenta attach to bladder so accidental tear of the bladder occurred and made the surgeon to repair.

After 2 hrs and 5 minutes spinal anesthesia wore off (T8), we performed general anesthesia with induction by etomidate 10 mg plus ketamine 50 mg, midazolam, intubation with succinylcholine 100 mg following three minutes pre-oxygenation. The trachea was intubated with a 7.0 mm tracheal tube with rapid sequence induction with cricoid pressure applied until the tracheal tube cuff was inflated and tube position verified. No other muscle relaxation anesthesia was given. The anesthesia was maintained with 1 - 2% sevoflurane, 50% nitrous oxide in oxygen. Most fluids were infused via a blood warming device. During this period, total operative time was 3 hrs and 10 min; estimated blood loss was 9,000 ml. The total volume of resuscitation was composed of crystalloid (NSS 1000 ml, acetar 5200 ml), Colloid (Voluven) 2000 ml, PRC 7 unit, FFP 4 unit, transmine 1 gm. Iv, calcium gluconate 10 ml. slow push, ephedrine iv. bolus 30 mg. The lowest blood pressure is 45/31 mmHg, PR 130 BPM, urine out put in first 2 hr was about 1 cc/kg but after 2 hr the bladder was opened due to attachment of the placenta and could not be recorded precisely.

Due to the accidental tear of the bladder and the unexpected adhesion band inside the pelvis which increased the difficulty of the approach to the surgical site, increase blood loss, increase operative time that impacted the operation. As the time of regional anesthesia was waring off and the vital signs of the patient were not stable, we used etomidate combined with ketamine for induction to maintain cardiovascular stability. Intubation was done to reduce the risk of aspiration and prepared the patient to encounter

difficult airway assessment by smaller endotracheal with guide on inside. A short handle laryngoscope and rapid sequence induction was used with cricoid pressure and succinyl choline for rapid onset and duration. Durig the maintenance phase, we could use inhalation because the uterus was removed, N₂O in O₂ was used to supplement the balance anesthesia. Midazolam would help to reduce the risk of awareness that might happen when the vital signs were unstable, and we need to decrease the anesthetic agent given.

The blood components that we had prepared were less than the requirement, besides we lost other blood components during the operation. Fortunately, our hospital is a big tertiary hospital that is connected to the Blood Bank Service of the Thai Red Cross Society so we could cross-match grouping and prepare for more packed red cell and fresh frozen plasma for this patient. Nevertheless, from this lesson learned next time we should be more prepared for more packed red cells, fresh frozen plasma, and platelets.

At the end of the operation, she was fully awake and responsive. The endotracheal tube was removed in the operating room; then she was transferred to the Intensive Care Unit (ICU) for close observation.

After the 1st-3rd post-operative days, she stayed in the ICU from the problem of oliguria due to volume depletion, but her vital signs were stable. The 1st laboratory examination after operation were WBC 13650, Hct 30.2%, platelets 63000, BUN 9, creatinine 0.5, sodium 145, potassium 3.8, chloride 112, bicarbonate 22. Decrease platelets represented improper resuscitation of the blood components. She was discharged from ICU to ward on the 4th post-

operative day to take care of her wound and bladder treatment and was finally discharged with her daughter on the 12th postoperative day in good condition.



Figure 1. After hysterectomy, uterus size became enlarged like a gravid uterus, the diameter was about 60 cm

Discussion

Placenta percreta, an extreme variant of placenta accreta, represents an abnormality of placentation, in which placental villi invade the decidua basalis of the uterus penetrating through the myometrium into the serosa.^(5, 8 - 10) In severe cases, the placenta may invade the intra-abdominal and/or pelvic structures. While the incidence of placenta percreta is reported as 0.03 per 1000 birth placenta percreta with invasion of the urinary bladder has only been reported 23 times in the English literature.^(1, 11)

Clark SL, et al⁽¹²⁾ reported 67% incidence of placenta accreta in women with placenta previa who had undergone for previous cesarean sections. Noguchi C, et al.⁽¹³⁾ revealed increased incidence of placenta percreta followed previous cesarean section and preoperative diagnosis was difficult. The summation of the maternal mortality in the subgroup of patients with placental invasion of the urinary

bladder has been reported as 9.5% with a perinatal mortality rate of 24%.⁽²⁾

Urinary bladder involvement also causes high morbidity and mortality risk for mother and child.⁽¹⁴⁾ Among the survivors, major morbidity has been reported. One patient required a total of 123 units of human blood products during the peri-operative course. Several patients required prolonged hospitalization to deal with the consequences of massive transfusion including adult respiratory distress syndrome and coagulopathy.⁽¹⁵⁾

Early signs and symptoms of placenta percreta are non-specific and can range from antepartum hemorrhage in a patient with placenta previa, to spontaneous uterine rupture. If the urinary bladder is involved, gross or microscopic hematuria may present.⁽¹⁾ Ultrasonic examination can indicate invasion of myometrium, while color Doppler flow studies can be strongly suggestive of hypervascularity associated with invasion of adjacent structures. Preoperative diagnosis allows a carefully planned team approach to surgery and delivery.

Anesthesia for cesarean hysterectomy in placenta accreta is controversy. Parekh N, et al.⁽¹⁶⁾ performed a retrospective survey of anesthesia for cesarean section in case of placenta previa: 7 of 140 patients with anterior placenta previa were placenta accreta; 5 of 7 patients with placenta accrete progressed to hysterectomy. Four patients had a spinal anesthesia, and only two patients from this group had general anesthesia for hysterectomy because of wore off spinal anesthesia due to delayed hysterectomy. Two of three patients who had general anesthesia had postoperative thrombotic episodes. Ascaris and colleagues⁽¹⁷⁾, reviewed retrospectively

in 180 patients and concluded that regional anesthesia was not contraindication, and resulted in significantly lower estimated blood loss in the regional anesthesia group same as data of Parekh N.^(16, 17)

From a retrospective study of Kato R, et al.,⁽¹⁸⁾ they found 22 cases of placenta percreta, 16 patients received hysterectomy. The range of blood loss was from 590 to 10500 ml. Half of the patients chose neuraxial anesthesia, 6 of them were converted to general anesthesia due to massive bleeding. In conclusion, they suggested to discuss cesarean section plan and anesthetic plan with obstetricians. The operation should have 2 experienced anesthesiologists, and be prepared for general anesthesia, with 2 large bore intravenous lines, an arterial line and 10 units of both fresh frozen plasma and cross-matched packed red blood cells but because we had limited information due to we have only abstract not full paper so we did not know the reason of the suggestion.

Kono N, et al.⁽¹⁹⁾ reported a case of placenta accreta that underwent hysterectomy under general anesthesia. Blood loss was 9000 ml due to difficult hysterectomy but they were able to manage fluid resuscitation well. We did not know the reason why they chose general anesthesia. Our research was limited with difficulty to access the information.

As for other studies, Chestnut DH. et al.⁽²⁰⁾ reviewed 25 hysterectomies (elective and emergency). 12 patients were given continuous epidural anesthesia, no requirement of general anesthesia but no evidence that epidural anesthesia significantly affected blood loss, fluid resuscitation.

Frederiksen C, et al.⁽²¹⁾ reported a retrospective study and reached a conclusion that

general anesthesia in placenta previa woman increases intraoperative blood loss and needs for blood transfusion. Regional anesthesia is a safe alternative.

Pasha SAA, et al.⁽²²⁾ said if the patient is stable with or without active bleeding, regional anesthesia is a better choice than general anesthesia due to better surgical field. It decreases the incidence of hysterectomy and neonatal outcome is better. In case of regional block vital signs should be well taken care of to reduce hypotension that can also decrease placental perfusion.

Garry M, et al.⁽²³⁾ reported anesthesia of choice for placenta previa: combined spinal epidural (CSE) could give anesthetic supplement via an epidural catheter and monitored cerebral function by the patient's consciousness.

Hong JY, et al.⁽²⁴⁾ performed prospective randomized trial to compare the maternal hemodynamic, blood loss and neonatal outcome of general anesthesia versus epidural anesthesia. The conclusion was epidural anesthesia is superior to general anesthesia in elective previous cesarean section with regard to maternal hemodynamics and blood loss but still inadequately inform of the significant complications such as hypotension, neurologic injury, local anesthetic toxicity and unwanted dural puncture.

De Nadal M, et al.⁽⁹⁾ reported a full term baby with placenta previa but, again, intraoperatively they found difficulty to remove placenta due to adhesion to the uterus that is a cause of massive bleeding and hypovolumic shock. Finally, general anesthesia was performed due to bleeding and hemodynamic instability.

Oyelese Y, *et al.*⁽⁶⁾ said regional anesthesia for case previous cesarean delivery was safe and not suggested to separate the placenta at the time of delivery. Same as Coates VA, *et al.*⁽³⁾, Kraemer B.⁽²⁵⁾, and Shukunami K, *et al.*⁽⁴⁾, they said removal of placenta that invaded the uterine wall is difficult or impossible and often causes massive bleeding. The mother's life may be safe if hysterectomy is performed.

The American College of Obstetricians and Gynecologists (ACOG) has a committee on placenta accreta and suggested if the clinician is confident in the diagnosis, he/she should perform hysterectomy while left the placenta inside because of massive bleeding may happen when they were trying to separate the placenta.⁽⁵⁾

Although sympathetic blockade induced by spinal anesthesia may make it more difficult to control blood pressure if severe hemorrhage occurs but ephedrine may help.⁽¹⁶⁾

Evaluation of blood loss during cesarean section is difficult, except the bleeding is seen in the operation field. The bleeding maybe concealed inside of the uterus like this case. We suggested to estimate from the enlargement of uterus related to the baby size.

In this case, the early diagnosis of placenta percreta was clued in the development of the surgical and anesthetic plans. Preoperative visit and assessed by all involved specialties. The main goals were to deliver a healthy newborn and to devise a surgical approach which would minimize blood loss and provide a dry surgical field. The planned operative approach began with cesarean delivery via a classical uterus incision in order to deliver the fetus quickly while avoiding laceration of the anterior low-lying

placenta. Leaving the placenta *in situ* and closing the uterus immediately would maintain a dry surgical field, making subsequent control of uterine feeding vessels easier. It was recognized in advance that almost all uterine bleeding would be per vagina and concealed in the close uterus and thus making it more difficult to quantify the blood loss. Anesthetic of choice in cesarean hysterectomy with placenta percreta still controversy, but regional anesthesia had more advantages in general cesarean section than general anesthesia. We decided to make a regional anesthetic in this patient because of first, the surgeon could stop bleeding from adhesion band and incision wound to exposure the surgical field more than general anesthesia that he should be concerned with neonatal outcome. The second reason is patient's will and respect to the decision of the patient that she refused general anesthesia in the beginning; and thirdly for avoidance of the risk of aspiration and difficult airways in pregnancy. However, later in this case, the bleeding was more than we what we had thought. It was corrected by transfusion through large-bore catheters and rapid infusion system was helpful. Next time, if we should suspect any case which placenta accreta, we would be more careful and prepare more blood components. Our intra-operative anesthetic management was primarily focused on replacement of blood loss. Determining the extent of hemorrhage concealed inside the uterus was difficult. All blood loss was estimated from hemodynamic variables and serial hemotocrits.

Conclusion

In summary, this case illustrates some of perioperative management of patients with placenta

percreta. If the patient presented for an urgent cesarean section without our foreknowledge of her condition, both the obstetrician and the anesthesiologist would have faced a truly life threatening situation with extremely grave implications for the mother and her fetus. In stable patients, regional anesthesia have advantages more than general anesthesia following the reasons above, however if we must to control hemodynamics stability, secure airway and control ventilation via general anesthesia may be better choice of anesthesia. Preparing of fluid resuscitation and blood component therapy are other way for success to safe patient's life. Planning of surgery such as left the uterus *in situ*, or immediate hysterectomy is important to keep patient's life. And finally, the awareness to communicate among the team members is the most important factor to protect your patient's life.

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