

Intraoperative Surgical Treatment of Undiagnosed Placenta Percreta

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Abstract

Background: To describe a case of a 38-year old pregnant woman with an intraoperative diagnosis of placenta percreta complicated by central placenta previa. The ultrasound scan did not show signs of any type of abnormal placental invasion, just central placenta previa was visualized.

Methods: At 36 weeks of gestation, she underwent an elective cesarean section combined with peripartum hysterectomy with bladder wall resection under general anesthesia because of antenatally undiagnosed placenta percreta.

Results: The therapy was provided by a multidisciplinary team, and the patient was in relatively good condition. Intraoperative blood loss was 2500 mL. A total of 10 units of red blood cells and 3 units of fresh frozen plasma were used. Anesthesia time was 2 h and 15 min. The postoperative course was adequate. A live, premature male baby (2420 g) was born 8 min after the beginning of the operation with Apgar scores 8 and 7 at 1 minute and 5 minutes.

Conclusion: We want to emphasize that, in spite of the absent typical symptoms and absent typical ultrasound signs of placenta percreta, we have to be cautious in the presence of risk factors. If we have a suspicion for adherent placenta, an MRI scan should be performed.

Keywords: Abnormal placentation; Placenta previa percreta; Ultrasound examination; Cesarean section; Hysterectomy; Bladder resection; Haemorrhage; Blood transfusion

Abbreviations: AFP: Alpha Fetoprotein; BMI: Body Mass Index; CTG: Cardiotocography; MAP: Morbidly Adherent Placenta; HCG: Human Choriogonadotropin; MRI: Magnetic Resonance Imaging

Introduction

Adherent placenta is responsible for 7% to 10% of maternal mortality cases worldwide [1]. Its maternal morbidity rate is 9.5% and perinatal mortality is 24%. The incidence of abnormal placentation has increased from 1 out of 2500 in the 1980s to 1 out of 533 in 2000 [2]. The incidence of accreta is 0.1 to 2.3 per 1000 births, and the incidence of percreta is 0.03 per 1000 births. The incidence of concomitant bladder invasion is approximately 1 in 10,000 births. The incidence of peripartum hysterectomy is 0.24 to 1.4 per 1000 births. Adherent placenta as a major indication for peripartum hysterectomy has risen from 5.4% to 46.5% over the past four decades [3]. The presence of a placenta previa, the risk of placenta accreta was 3%, 11%, 40%, 61%, and 67% for the first, second, third, fourth, and fifth or greater repeat cesarean deliveries [4]. Three types of adherent placenta are distinguished: placenta accreta is abnormal adherence of the placenta only to the myometrium, placenta increta involves invasion of the myometrium, while percreta involves invasion through the serous surface of the uterus. Placenta percreta can lead to bladder injury, bowel injury, life-threatening haemorrhage, amniotic fluid embolism, coagulopathy and peripartum hysterectomy. If it is not diagnosed in an early stage, it can lead to severe maternal morbidity. The most common risk factor for adherent placenta and placenta percreta is cesarean section. Besides cesarean delivery further risk factors are reported as multiparity, uterine fibroids, embolization of uterine fibroid, advanced maternal age, second-trimester serum levels of alpha-fetoprotein (AFP) and free beta-hCG greater than 2.5 multiples of the median without any anatomical malformation, hypertensive disorders, or smoking [5-7], any condition resulting in myometrial tissue damage such as previous myomectomy, endometritis, endometrial defects due to curettage resulting in Asherman syndrome [8], thermal ablation [9], and uterine artery embolization [10]. Such abnormalities include placenta previa as well as placenta accreta. We present the case of a 38-year-old woman

with suspicion of placenta accreta prenatally and intraoperatively diagnosed with anterior placenta percreta complicated by placenta previa. Placenta percreta can be associated with extreme haemorrhage, thus, preoperative planning is advised.

Materials and methods

The diagnosis of adherent placenta is established by ultrasonography and occasionally by magnetic resonance imaging (MRI). Ultrasonography findings of accreta and percreta include loss of myometrial interface, retroplacental "clear space", reduced myometrial thickness, intraplacental lacunae, turbulent blood flow through the lacunae in Doppler ultrasonography [11,12], and an irregular bladder wall. Placental bulging or invasion into the bladder is also frequently seen. The presence of lacunae within the placenta at 15-20 weeks of gestation has been shown to be the most predictive sign of placenta accrete in the ultrasonogram, with a sensitivity of 79% and a positive predictive value of 92% [13]. These lacunae may result in a placenta having a "moth-eaten" or "Swiss cheese" appearance. MRI may help in diagnosing invasive placentation, mainly in those conditions when the ultrasound findings are not conclusive enough to assess the degree of the invasion. It is more accurate in diagnosing a posterior placenta, placenta percreta with or without placenta previa and for obese patients. MRI is more costly and accurate than ultrasonography in identifying adherent placenta [14]. Features of placenta percreta in non-enhanced 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

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adjacent organs [15]. The use of gadolinium contrast is controversial because of the risk of possible fetal effects. It may penetrate through the placenta. It enables MRI to more clearly delineate the outer placental surface relative to the myometrium, and differentiate between the heterogeneous vascular signals within the placenta from those caused by maternal blood vessels. A multidisciplinary approach by a team of experienced obstetricians, anaesthetists, nurses, interventional radiologists, neonatologists, urologists and blood bank officers ensures the best outcomes [16]. It is fundamental that obstetricians are aware of the risk factors and diagnostic modalities for placenta accreta because of its potential emergent nature and the associated risk of life-threatening haemorrhage. Women with any type of adherent placenta should be treated at a tertiary perinatal care center. Optimum management of placenta percreta requires early detection and a planned cesarean hysterectomy, ideally at about 35-36 weeks [17]. Occasionally, a subtotal hysterectomy can be safely performed, but persistent bleeding from the cervix may preclude this approach and make total hysterectomy necessary. Hysterectomy has been the gold standard in management, but conservative management can be used in selected cases [18]. Conservative interventions are recommended before radical procedure in order to minimize surgical complications and preserve fertility. The conservative options for peripartum hysterectomy included uterotonic drugs, external compression with uterine sutures (B-Lynch, Hayman, Cho), intrauterine packing (Bakri balloon), Triple-P procedure, and selective devascularization by ligation or embolization of the uterine artery [19-21]. Identifying the extent of infiltration by the placenta and performing preoperative placement of bilateral iliac artery or aorta balloon catheters to be inflated after delivery can considerably reduce the bleeding. Preoperative placement of ureteral stents can help identify the ureters, allowing more rapid completion of the hysterectomy [22]. Retaining the placenta *in situ* at cesarean section for placenta percreta and awaiting placental reabsorption is widely practiced; however, there is limited evidence on the efficacy and complications of this strategy: high rate of sepsis, postoperative haemorrhage, and secondary hysterectomy. Methotrexate has been widely used to increase the rate of placental reabsorption.

Results

A 38-year-old woman was admitted to our clinic for prenatal observation, and her second elective cesarean section at 34 weeks' of gestation, and for her central placenta previa complicated by placenta accreta. She had a history of nine previous pregnancies, two terminations, seven deliveries and one cesarean section due to intrauterine fetal distress. She underwent ultrasonography during pregnancy to rule out other types of adherent placenta such as placenta increta and percreta, but the scan did not show signs of any other type of abnormal placental invasion, so she did not undergo MRI. ~~An ultrasound examination revealed a single intra-uterine live male foetus in normal presentation and central placenta previa with typical signs of placenta accreta like intraplacental lacunae, turbulent blood flow through the lacunae in Doppler ultrasonography and loss of myometrial interface without irregular bladder wall~~ (Figures 1 and 2). She suffered from obesity, her pregestational body mass index was 31 kg/m², her weight gain was 4 kg during pregnancy, and second-trimester serum level of AFP value was 2.1 multiples of median. She did not smoke either before or during pregnancy. No haematuria was detected. Her blood group was "A" Rh negative. On admission, the patient was hemodynamically stable. There were no uterine contractions and she did not have any vaginal bleeding. Symptoms such as haematuria occur in approximately 25% of the cases. The fetal heart rate was 140 beats per minute, and CTG was evaluated by reactive result. We had to be cautious during the vaginal examination

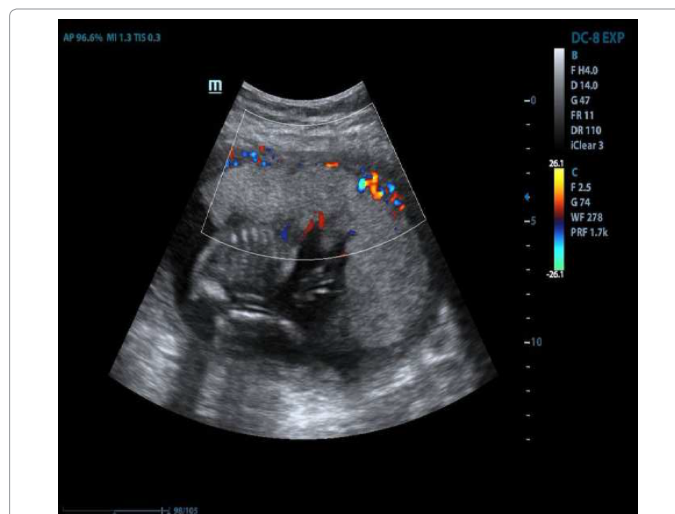


Figure 1: Ultrasound investigation of the placenta at 20 weeks of gestation (Color Doppler-mode). There is not increased vascularity and 'aliasing' at retroplacental zone. The evaluation of placental vessel architecture with Doppler imaging may help differentiate. It should be noted that placenta accretes have been reported with absent multiple vascular lacunae.



Figure 2: Ultrasound investigation of the placenta at 20 weeks of gestation (B-mode). Visualization of prominent vessels or lakes within the placenta or myometrium is missing. Normal-like hypoechoic retroplacental zone between the placenta and uterine wall.

because of the higher chance of bleeding. The cervix was closed (3.1.0.0.). On admission, the patient was given antenatal corticosteroid (4 times 6 mg Dexamethasone in 12 hours). Given the findings, a planned cesarean section was performed at 36 weeks of gestation under general anesthesia in the presence of experienced, skilled obstetricians, anaesthetists, neonatologists, urologists and nurses. General anesthesia was chosen to get better muscle relaxation because of procedure's length and a better hemodynamic stability in case of a possible massive haemorrhage. During general anesthesia, propofol, fentanyl, atropin, esmeron, stigmosan were administered, and anesthesia was maintained by using propofol and fentanyl. After opening the abdominal wall, intra-abdominal inspection revealed placental tissue on the external surface of the uterus, accordingly in the previous cesarean section's scar. On the border of the active and passive parts of the uterus, a transversal cut was performed. We extracted a live, premature male baby (2420 g) 8 min after the beginning of the operation, with Apgar scores 8 and

7 at 1 minute and 5 minutes. At birth, the premature infant required extra oxygen through ambu-mask for 30 sec, after that O₂ saturation was 95%, umbilical cord blood pH value was 7.35, Hematocrit was 42%, blood glucose value was 3.6 mmol/L, temperature was 36.6°C, pulse was 134/min, urinary bacteriology test was positive to Klebsiella pneumoniae. As antibiotic therapy, Amoxicillin/Clavula acid was administered. In the adaptation phase, she had tachypnea, but 6 hours later it disappeared. She tolerated the feeding. The surgeon could not extract the whole placenta tissue manually. A part of the placenta which was placed on the anterior wall of the uterus near the neighbouring bladder was completely embedded in the myometrium and serosa reaching the wall of bladder. Hence the obstetrician was unable to separate the entire placenta because it was penetrating the uterus and it was eroding the posterior wall of the bladder. The urologist performed a partial cystectomy of the posterior wall of the bladder to separate the placenta, after which hysterectomy was undertaken with repair of the wall of the bladder leaving back an epicytostomy catheter. Intra-operative bleeding was 2500 mL, and hemodynamic instability developed. The patient was managed with vasopressors, blood products, and fluid replacement: exacyl, ephedrine, hemocompletan, oxytocin, and Standacillin. Transfusion was initiated. A total of 10 units of red blood cells and 3 units of fresh frozen plasma were administered. Anesthesia time was 2 h and 15 min. The postoperative recruitment was adequate. The urine catheter was removed on the 10th and epicytostomy catheter on the 3rd postoperative day. The uterus was sent to the pathology institute for examination. Histology confirmed a morbidly adherent placenta percreta involving the uterine serosa. She was discharged on the 11th postoperative day in good health condition. She had satisfactory Hemostasis: the blood pressure was 115/75 mmHg, and the pulse was 83 per minute.

Discussion

Abnormal placental adherence can be classified into three distinct conditions: placenta accreta, increta and percreta. Placenta percreta is the most severe of the abnormally invasive placentas, and it is associated with a significantly higher morbidity and mortality. Their incidence has increased parallel with the increasing rate of cesarean deliveries. Recognition at an early stage of the adherent placenta and the multidisciplinary team work are essential in the light of the treatment and the clinical outcome of the patients with placenta percreta. The diagnosis of placenta percreta before the delivery may give us a chance to plan a multidisciplinary attempt to reduce potential maternal or neonatal morbidity and mortality. However, several cases of placenta accreta, increta and percreta are not diagnosed antenatally, despite the presence of the risk factors. Obstetricians should be vigilant in the diagnosis of adherent placenta, even if ultrasonography results are normal, just like in our case. Ultrasonography is a useful method in screening for placenta previa and adherent placenta. In cases, if there is a suspicion of abnormal placental adherence and no typical signs of adherent placenta are seen, MRI should be used to identify placental location accurately, regardless of the ultrasonography findings. The risk factors of clinical history should be highlighted: obesity, blood group, AFP, and multiparity. In our case, there were no typical clinical features, but AFP was elevated and BMI was above the normal value.

Regarding placenta percreta, different kinds of surgical strategies exist, such as local resection, leaving the placenta *in situ* (when the aim is to preserve fertility) and hysterectomy. Nowadays, conservative interventions are recommended before radical procedure in order to minimize surgical complications. These vascular interventions are balloon occlusion and/or embolization of the vessels supplying the

placenta and the uterus [23]. A study has compared these procedures [23]. The most frequent complications when the placenta was left *in situ* were secondary hysterectomy, postoperative haemorrhage and infection. In hysterectomy, the bladder injury was higher than in other procedures. Following local resection, there were no significant complications, but due to the infrequency of placenta previa, it is often not possible to acquire proficiency in the local resection technique. Hysterectomy was chosen in the majority of the cases included in this review. The estimated blood loss was the least when endovascular balloon occlusion of the common iliac artery or the aorta was used [23]. Nelson and O'Brien have reported that placing an intrauterine Bakri balloon in conjunction with the B-Lynch uterine compression suture defined as "uterine sandwich" was successful in treating uterine atony.

Nowadays evidence suggest that in cases of morbidly adherent placenta (MAP) leaving placenta and either considering embolization or returning at later time for hysterectomy is a safer method [23]. Despite the early and accurate prenatal diagnosis, hysterectomy remains the most common surgical procedure in cases of peripartum hysterectomy for placenta previa accreta. According to our opinion, the decision whether to choose hysterectomy electively, leave the placenta *in situ* or perform local resection depends on the available expertise in each medical center. We wish to emphasize that, in spite of the absent typical symptoms and absent typical ultrasound signs of placenta percreta, we should be vigilant about the presence of risk factors. If we have a suspicion of adherent placenta, MRI should be performed.

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