Original Article

Therapeutic termination of pregnancy with complete placenta praevia in the second and third trimesters

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Background: Placenta previa is one of the complications of pregnancy. Complete placenta previa is the most serious type of placenta previa. It means that the placental tissue completely covers the internal orifice of the cervix. With the rising use of caesarean section (CS) and the increase in maternal age, the incidence of placenta praevia, placenta increta, and their associated complications have continued to increase. Since the early 20th century, the incidence of placenta increta has increased 13-fold. Complete placenta praevia and placenta increta are associated with a higher risk of maternal and fetal complications, especially postpartum hemorrhage. Because of fetal death, lethal anomalies, and maternal complications, the number of patients who are in the second and third trimesters of pregnancy needing to undergo therapeutic abortion is rising. Moreover, in present-day China, many patients with placenta praevia have a history of CS and the condition may be further complicated by placenta increta. Nevertheless, there is a lack of evidence relating to the management of patients with complete placenta praevia who seek therapeutic abortion in the second and third trimesters, and much less regarding placenta increta. The experience with these patients is limited and debate still surrounds the clinical management. So, the aim of this article is to study the delivery mode of therapeutic abortion complicated with complete placenta praevia in the second and third trimesters.

Methods: The data of 25 women with complete placenta praevia who underwent therapeutic abortion in the second or third trimester at the largest medical center in Western China between April 2015 and June 2018 were collected. The women were categorized into two groups: the placenta praevia without placenta increta group (PP group, n=13) and the placenta praevia with placenta increta group (PI group, n=12). The mode of delivery and clinical outcome were obtained from the medical records. The delivery mode and the incidence of adverse events were compared between the two groups.

Results: All of the patients in the PP group had a vaginal delivery without hysterectomy. The patients in the PI group had a lower success rate of vaginal delivery (33% *vs.* 100%), longer mean hospital stay (19.5 *vs.* 9 days), longer interval from intra-amniotic injection of ethacridine lactate to delivery (223.72 *vs.* 86.69 hours), and considerably more blood loss (1,926.25 *vs.* 359.23 mL).

Conclusions: Vaginal delivery is recommended for patients complicated with complete placenta praevia who undergo therapeutic abortion in the second or third trimester. However, when placenta increta is present, doctors should consider hysterotomy abortion or curettage after preventive uterine artery embolization.

Keywords: Complete placenta praevia; placenta increta; therapeutic abortion

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Introduction

With the rising use of caesarean section (CS) and the increase in maternal age, the incidence of placenta praevia, placenta increta, and their associated complications have continued to increase (1). Since the early 20th century, the incidence of placenta increta has increased 13-fold (2). Complete placenta praevia and placenta increta are associated with a higher risk of maternal and fetal complications, especially postpartum hemorrhage. Because of fetal death, lethal anomalies, and maternal complications, the number of patients who are in the second and third trimesters of pregnancy needing to undergo therapeutic abortion is rising (3). Moreover, in present-day China, many patients with placenta praevia have a history of CS and the condition may be further complicated by placenta increta. Nevertheless, there is a lack of evidence relating to the management of patients with complete placenta praevia who seek therapeutic abortion in the second and third trimesters, and much less regarding placenta increta. The experience with these patients is limited and debate still surrounds the clinical management.

In this retrospective study, we collected the data of 25 patients in the second and third trimester who underwent therapeutic abortion due to complete placenta praevia. We retrospectively summarized the delivery mode and clinical outcome of complete placental praevia, with or without placenta increta, and analyzed the clinical features and the management of complete placenta praevia complicated with previous CS.

Methods

Patient data

This retrospective study was carried out in the Department of Obstetrics and Gynecology, West China Second University Hospital, Sichuan University. The study included all patients (n=25) with complete placenta praevia of the second or third trimester who sought therapeutic abortion at the hospital via induction between April 2015 and June 2018. The patients were divided into two groups: the complete placenta praevia without placenta increta group (PP group, n=13) and the complete placenta praevia with placenta increta group (PI group, n=12). The clinical profiles and detailed obstetrical and puerperal information available from the patients' medical records were thoroughly reviewed. The demographics (age, gravity, parity, and gestational age), labor induction, delivery mode, and clinical outcome were summarized from the medical records and compared between the two groups.

Diagnosis of complete placenta praevia

Complete placenta praevia was diagnosed by transvaginal ultrasound when the placenta appeared to cover the internal cervical os completely. If placenta increta was suspected by ultrasound, magnetic resonance imaging (MRI) was carried out. Placenta increta was reported by both transvaginal ultrasound and MRI as irregularly shaped placental lacunae (vascular spaces) within the placenta, the thinning of the myometrium overlying the placenta, and the loss of the retroplacental "clear space" , as described earlier by Comstock (4).

Indications and method of termination

The indications for termination were life-threatening maternal complications, lethal fetal anomalies, or fetal genetic abnormalities. All third-trimester patients were induced due to intrauterine fetal death. According to the Chinese National Guideline for Family Planning Technique, an intra-amniotic injection of ethacridine lactate (EL; Rivanol®), which is an antiseptically treated dye, can be used for therapeutic abortions in the second trimester (5). The ethacridine lactate stimulates endogenous prostaglandins and thromboxane, most likely by triggering chemical trauma of the fetal membranes and deciduas, thus promoting cervical ripening and initiating labor.

Statistical analysis

Statistical analysis was conducted with SPSS Statistics for Windows, Version 19.0. (IBM, New York, USA). Data were analyzed with Student's *t*-test for quantitative variables and chi-squared test for qualitative variables. Statistical significance was represented by $P<0.05$.

Table 1 The demographics and clinical data

Variables	PP group (N=13)	PI group (N=12)	P value
Maternal age (year)	30.77±5.69	31.83±4.78	0.619
Gestational age (week)	24.12±3.22	23.57±4.60	0.731
Gravity	4.23±2.49	4±1.60	0.787
Median parity	0	1	0.004*
Prior CS (N, %)	5 (38.46)	10 (83.33)	0.041*
Way of Labor induction (acrinol ethacridine) (N, %)	13 (100.00)	8 (66.67)	0.027*
UAE (N, %)	6 (46.15)	8 (66.67)	1.000
Vaginal delivery (N, %)	13 (100.00)	2 (16.67)	0.000*
Uterine Loss (N, %)	0	2 (16.67)	–
Mean Hospital stay (days)	9±3.49	19.5±13.98	0.000*

*, P<0.05. PP, placenta praevia without placenta accreta; PI, placenta praevia with placenta increta; CS, Cesarean Section; UAE, Uterine Artery Embolization.

Table 2 Comparison of surgical procedures, blood loss and transfusion

Variables	PP group (N=13)	PI group (N=12)	P value
Mean interval between MI and delivery (h)	86.79±105.60	223.72±181.239	0.04*
Mean blood loss (mL)	359.23±186.66	1926.25±1239.19	0.000*
Units of packed red cells transfused (u)	0.27±0.67	5.21±4.97	0.002*
Plasma transfused (mL)	0	325±421.85	0.011*

*, P<0.05. PP, placenta praevia without placenta accreta; PI, placenta praevia with placenta increta; MI, medical induction (intra-amniotic injection of ethacridine lactate).

Results

Patient demographics

The patients' demographics and clinical outcomes are shown in *Table 1*. The patients were aged between 23 and 40 years with gestational age ranging from 14 to 31 weeks. No difference was observed between the mean maternal age, mean gestational age, or mean weight of the two groups (P>0.05) (*Table 1*), nor was a difference observed in the ratio of uterine artery embolization (UAE) (P>0.05) (*Table 1*). There were no cases of maternal mortality, or complications stemming from UAE or intra-amniotic injection of ethacridine lactate. EL was used to trigger abortion in all 13 patients in the PP group and in 8 of the 12 patients in the PI group. Because UAE has been proved to be a useful procedure for preventing uncontrollable bleeding and unnecessary damage to the uterus (6), 6 patients in the PP group and 8 patients in the PI group who experienced moderate or massive vaginal bleeding received UAE.

All of the patients in the PP group had a vaginal delivery without hysterectomy, including 38.46% (5/13) who had placenta praevia complicated by a history of CS but no placenta implanted in the uterine scar (*Table 2*). In the PI group, nine patients received ethacridine lactate induction of labor and the other three had CS directly. Only two patients (16.67%) had a successful vaginal delivery, and two underwent hysterectomy because of heavy bleeding during labor. In the PI group overall, 83.33% (10/12) patients had placenta praevia complicated with previous CS, and 66.67% (8/12) had the placenta implanted in the uterine scar.

Clinical outcomes

Compared with the PP group, the PI group had a lower success rate of vaginal delivery (33% *vs*. 100%), longer

mean hospital stay (19.5 *vs.* 9 days), longer interval between intra-amniotic injection of ethacridine lactate and delivery (223.72 *vs.* 86.69 hours), and considerably more blood loss (1,926.25 *vs.* 359.23 mL) (P<0.05) (*Tables 1,2*). Patients in the PI group were also transfused with more packed red cells (5.21 *vs.* 0.27 U) and plasma (325 ml *vs.* 0 mL) than their PP counterparts (P<0.05) (*Table 2*).

Discussion

Termination of pregnancy in the second and third trimesters carries a risk of morbidity and mortality three to five times higher than that of termination performed in the first trimester. There is a consensus that a complete placenta praevia with a fetus that may survive requires delivery by CS. However, if the fetus cannot survive, CS is not a wise choice; uterine rupture, placenta praevia, and ectopic pregnancy have all been described as classical long-term side effects (7). When therapeutic abortion is considered for complete placenta praevia in the second or third trimester, doctors are challenged to find a safer mode of delivery, whether placenta increta is suspected or not. Unfortunately, little data have been published to address the nuances of various management strategies for this complex issue.

Our study revealed that vaginal delivery is feasible for patients with complete placenta praevia without placenta increta who undergo therapeutic abortion in the second and third trimesters of pregnancy. All of the patients in the PP group delivered successfully through the vagina and the mean blood loss was only 359 mL; on average, they received only 0.27 units of red blood cells, and none of the patients experienced uterus loss. In 2000, the successful vaginal delivery of a fetus at 21 weeks in the presence of placenta praevia was first reported by Sillender, who used mifepristone and intravaginal prostaglandin, resulting in little blood loss and no surgery (8). Similar results have been achieved by other organizations (9). We speculated that the placenta might move up when the lower uterine segment is extended and elongated during the course of labor. Such changes may facilitate cervix dilatation and fetal delivery. Without placenta adhesion or placenta increta, the majority of patients with placenta praevia can have a successful vaginal delivery.

During 2007–2008, the World Health Organization (WHO) reviewed almost 110,000 births in nine Asian countries and found that 46% of babies in China were delivered by CS, representing the highest rate for the procedure worldwide (10). The dominant maternal risk of CS in subsequent pregnancies is the spectrum of placenta praevia, placenta increta, and their associated complications. Jang found that the anterior placenta located beneath the uterine incision serves as an important predictor of placenta increta in patients with placenta praevia (11). Placenta praevia with placenta increta threatens great harm for the mother as well as the fetus. Once the uterual serosa has been penetrated, a severe and rare, and potentially life-threatening type of pernicious placenta praevia is formed. After the onset of uterine contractions, our data showed that patients with placenta praevia and placenta increta are prone to vaginal bleeding, which in some cases proves fatal. Only 16.67% of patients in the PI group succeeded in vaginal delivery, and the patients in the group lost on average 1,926 mL of blood, which was much more than the PP group. Additionally, in the PI group, 83.33% patient eventually needed surgery because conservative medical treatment had failed. One patient in our study underwent subtotal hysterectomy 56 days after vaginal delivery of the fetus because of massive vaginal bleeding. Another patient received a hysterectomy because of heavy bleeding during the curettage of the placenta residue. Therefore, for patients complicated with complete placenta praevia who seek therapeutic abortion in the second and third trimesters, doctors should carefully evaluate their condition and make a thorough therapeutic plan. When placenta increta is present, hysterectomy abortion or curettage after preventive uterine artery embolization is recommended.

Hansch indicated that UAE, with a success rate of over 90%, is a first-line alternative to surgery for controlling obstetric hemorrhage (12-14). The high success rate, low morbidity rate, timeliness of rescue, and possibility of preserving reproductive function have made this technique a safe choice to control life-threatening and intractable postpartum hemorrhage (6,15). In this study, 14 patients underwent UAE when experiencing moderate or massive vaginal bleeding. Gelatin sponge was used as the embolic medium in our study. Only one patient still had massive bleeding after UAE and a life-saving hysterectomy was eventually performed. Timely UAE may reduce vaginal bleeding; however, it may also inhibit uterine contractions, prolong the duration of labor, and even lead to the failure of labor induction.

Our research still has some limitations, mainly due to the small sample size. However, due to the development of medical level, we can not choose samples that are too old for research. Therefore, in the future research, we can consider to include the data of other medical institutions at

the same level for research.

Conclusions

For patients with complete placenta praevia indicated for therapeutic abortion in the second- and third trimesters, vaginal delivery should be considered as an option. However, for patients with placenta accreta, vaginal delivery dramatically increases the risk of heavy postpartum hemorrhage, blood transfusion, and obstetric hysterectomy caused by massive blood loss or placenta residue. In such cases, doctors may consider hysterotomy abortion or curettage after preventive UAE. Further research is needed to determine the suitable time point for hysterotomy abortion after UAE.

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Footnote

Data Sharing Statement: Available at https://gpm.amegroups.com/article/view/10.21037/gpm-19-41/dss

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at https://gpm.amegroups.com/article/view/10.21037/gpm-19-41/coif). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. This research does not involve human subject trial. Instead, the data come exclusively from case records from April 2015 to June 2018. According to the (Trial) Plan of Ethical Review on Biomedical Research Involving Human from the Ministry of Health, the Medical Ethics Committee of West China Second University Hospital has registered and approved this research project. Informed consent was obtained from all participants.

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