

SHORT REPORT

## Successful management of intraoperative hemorrhage from placenta previa accreta: intrauterine tamponade balloons brought out through the abdominal wall

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### Abstract

**Background:** Conservative management for placenta previa accreta (PPA) may be preferred, but uncontrollable hemorrhage sometimes occurs during a cesarean section.

**Case:** We present a case with a successful maneuver for the management of intraoperative hemorrhage in PPA. Profuse hemorrhage occurred due to partial placental separation during a cesarean section. The bleeding was stopped by the placement of intrauterine tamponade balloons with their shafts passed through the anterior abdominal wall. The catheters were removed after 24 h. The patient had no complications, and the placenta spontaneously resorbed three months after delivery.

**Conclusion:** This is a useful addition to the options for management of PPA at cesarean section.

### Keywords

Conservative management, intraoperative hemorrhage, intrauterine balloon tamponade, placenta previa accreta

### History

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### Case report

A 33-year-old Japanese woman, gravida 1, para 1, had a scheduled cesarean section at 36 weeks' gestation with diagnosis of placenta previa accreta (PPA) with suspected bladder invasion. She had a history of cesarean section at 33 weeks' gestation for fetal growth restriction and preeclampsia. Under spinal anesthesia, the patient underwent the placement of ureteral single pigtail stents. The bladder was difficult to separate from the highly vascular lower uterine segment. A vertical uterine incision was performed to avoid incising the placenta, and a 2654 g healthy female infant was delivered with Apgar scores of 8 and 9 at 1 and 5 min, respectively. Oxytocin administration led to appropriate uterine contractions, but the majority of the placenta did not separate. However, significant bleeding occurred from a relatively small site of the placental detachment immediately after delivery, and persisted despite hemostatic suturing. Two 100-mL saline-filled 22-Fr Foley balloon catheters were placed in the uterus, and the hemorrhage stopped. Because the cervical canal was completely covered with the placenta left *in situ*, the distal ends of the balloon shafts were placed through the cesarean hysterotomy incision and the anterior abdominal wall (Figure 1A–C). A penrose drain was placed around the anterior cul-de-sac. Although the patient's hemoglobin dropped from 10.0 to 7.1 g/dL, she remained in hemodynamically stable condition using transfusion of 1600 g

autologous blood and 320 g intraoperative cell salvage. The catheters were easily removed after 24 h. Intra- and post-operative antibiotics were performed using intravenous administration of tazobactam sodium and piperacillin sodium for five days. Oral methylethylergometrine maleate (0.75 mg per day) and metronidazole vaginal suppositories (250 mg) were used for approximately three months. The patient had no complications, including delayed hemorrhage and infection. Ultrasonography follow-up every 2 weeks showed that the placenta gradually resorbed spontaneously, and the placenta completely disappeared at 95th day after delivery (Figure 1D–F).

### Discussion

We found that placement of intrauterine tamponade balloons brought out through the abdominal wall at the time of cesarean delivery was a useful addition to the options for management of profuse intraoperative hemorrhage in a patient with PPA.

PPA with bladder invasion is associated with a 5.7% risk of maternal mortality and high morbidity including severe hemorrhage and urologic injury [1]. The management strategy at cesarean delivery is a cesarean hysterectomy or conservative management that leaves the placenta *in situ*. Conservative management has been gradually accepted because it can avoid uncontrollable bleeding and severe injury of the bladder. Sentilhes et al. reported that approximately 80% of placenta accreta can be conservatively treated [2], and the placenta often resorbed spontaneously [2,3]. However, partial detachment of the placenta after delivery of

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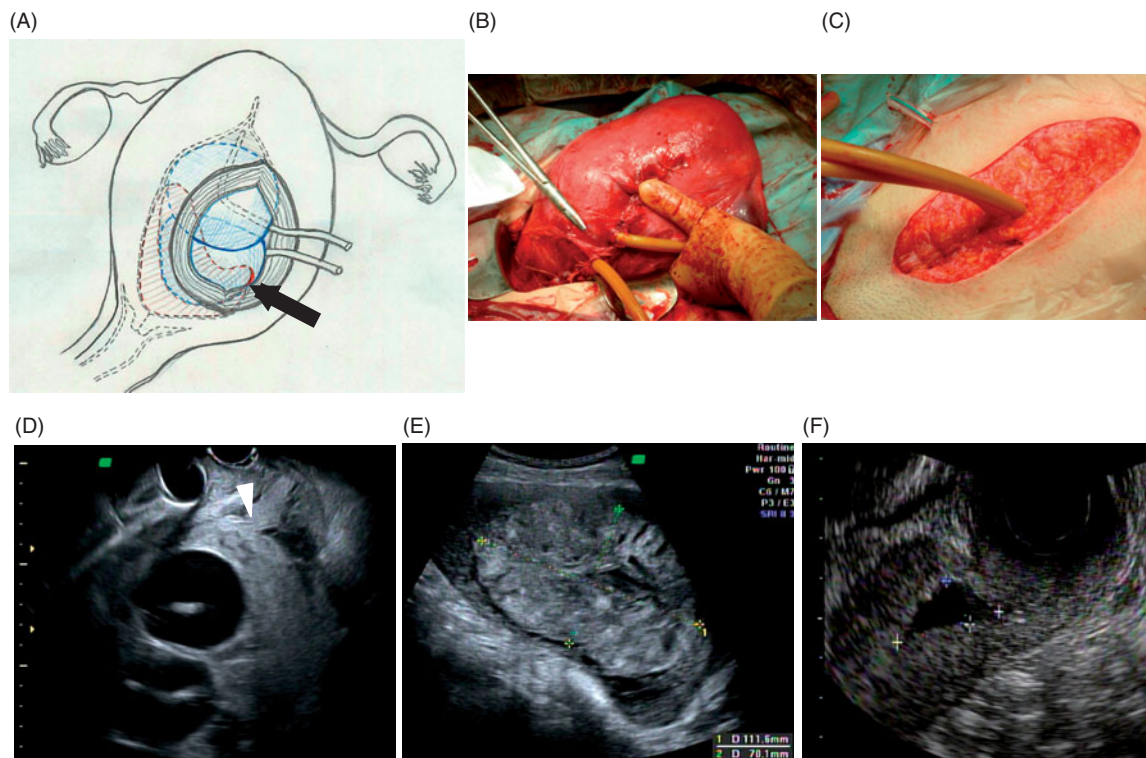


Figure 1. Intrauterine tamponade balloons for placenta previa accreta (A–C) and serial ultrasound images of the placenta (D–F). A scheme (A) shows that the surface of the balloon is tightly opposed to the disrupted site of the placenta (arrow). The shafts of Foley balloon catheters were brought through the cesarean hysterotomy incision (B) and through the anterior abdominal wall (C). Transvaginal ultrasonography shows that the placenta left in situ exists between intrauterine tamponade balloons and internal os (arrowhead) on postoperative day 1 (D). The retained placenta (E, postoperative day 39) completely disappeared on postoperative day 95 (F).

the baby causes massive hemorrhage and usually prompts hysterectomy. The cesarean hysterectomy is, however, linked to further blood loss and urologic complications, especially in cases with PPA with bladder involvement [1]. Conservative management, leaving the placenta in situ, is another option to reduce hemorrhage, to preserve fertility, and to prevent damage to the bladder or the ureters [2,3]. This can be attempted for a woman who is not bleeding significantly at cesarean delivery. If massive hemorrhage is encountered, emergent transcatheter arterial embolization (TAE) is needed to keep a chance of conservative treatment [3]. Successful TAE is almost necessary for conservative management. In our institution, conservative treatment is routinely performed for PPA, and multidisciplinary teams, including interventional radiologists, are assembled in each case as it is difficult to predict which case presents profuse bleeding. Intraoperative intractable bleeding otherwise necessitates hysterectomy.

In recent years, intrauterine tamponade balloons have been widely used for the management of postpartum hemorrhage [4]. The balloon provides tamponade to the placenta and to the endometrial surface at the disrupted site of the placenta. The catheter allows drainage to monitor ongoing blood loss. Albayrak et al. reported the use of intrauterine balloon tamponade for PPA [5], and we also experienced two cases of PPA in which bleeding was successfully controlled by intrauterine balloon tamponade (unpublished data). Albayrak et al. stated that the placenta was extirpated in fragments [5], and our previous two cases had partially adherent placenta and more than half the placenta detached

spontaneously. Intrauterine tamponade balloons were therefore placed with the stem brought out through the vagina. However, when placenta is abnormally adherent to the extensive area of myometrium covering internal os, forced manual removal of the placenta in an attempt to obtain an empty uterus should be avoided because it causes massive hemorrhage. To date, intrauterine tamponade balloons have not been used for the conservative management of PPA with the placenta completely left in situ because the ends of the catheters are not passed through the uterine cervix. In this case, the balloon was placed with the stem brought out not through the vagina but through the anterior abdominal wall. Bakri balloon, which just became available this April in Japan, would obviate the need for two uterine exit wounds. To the best of our knowledge, we are the first to apply this technique to control intraoperative hemorrhage of PPA. This method is feasible, and less invasive and less time-consuming than TAE and hysterectomies. It is controversial whether or not balloon tamponade could be contraindicated in placenta previa percreta. As the increases of intrauterine pressure by balloons might cause uterine rupture, further investigation is needed to clarify the safety of this technique for placenta previa percreta. We believe that when attempting conservative management of PPA, intrauterine balloon is a worthwhile approach for intraoperative hemorrhage, and may save TAE and improve the success rate of conservative treatment.

#### Declaration of interest

The authors report no conflict of interest.

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