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Administration of the Cook Cervical Ripening Balloon to Stop Cervical Bleeding in a Patient with Placenta Previa: A Case Report

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ABSTRACT

Objective: Placental implants in the cervical canal may occur result in patients with placenta previa that lead to bleeding after placental removal. Bleeding from the cervical canal can be stopped by inserting the Cook Ripening Balloon.

Case Presentation: A 31-week pregnant an was brought to the emergency clinic with a complaint of vaginal bleeding, and active vaginal bleeding was observed. Ultrasonography showed a fetus with fetal bradycardia and placenta previa. The patient underwent emergency Caesarean delivery. The placenta was easily removed without any complications. Bleeding from the cervical canal was observed by vaginal examination. The Cook Cervical Ripening Balloon was inserted into the cervical canal, and the bleeding stopped. The patient was discharged healthy.

Conclusion: Bleeding from the uterine cervix can be stopped by insertion of the Cook Cervical Ripening Balloon.

Keywords: Cervical Bleeding, Caesarean delivery, Cook Cervical Ripening Balloon, Placenta Previa.

INTRODUCTION

The placenta covering the opening of the cervical canal is defined as placenta previa; the worldwide incidence of placenta previa is 0.3–0.9% (1,2). The placenta previa rate has increased in recent years due to the increase in the number of Cesarean section deliveries and the application of assisted productive technology (1,3). Placenta previa may result in excess bleeding before, during, or after delivery, which could cause maternal and fetal morbidity and mortality (4,5). In the case of placenta previa, Cesarean delivery is required. After the removal of the placenta, there may be excessive bleeding in the placental bed, sometimes resulting in life-threatening blood loss (4,5). A Bakri balloon, two autonomous Zhukovsky balloon catheters (intravaginal and intrauterine), and a Foley balloon can be placed in the uterus in cases in which bleeding arises from the lower uterine segment (6). If these interventions do not stop the excess bleeding, an emergency Cesarean hysterectomy may be required to decrease maternal morbidity and even prevent mortality.

In some cases, placental implants placed in the cervical canal can lead to excessive bleeding after the removal of the placenta (6). Bleeding from the cervical canal cannot be observed through a Cesarean incision. Thus, in pregnant patients with placenta previa undergoing a Cesarean delivery, a vaginal examination should be performed to check if there is bleeding from the cervical canal. If bleeding is observed, the Cook Cervical Ripening Balloon can be implanted in the cervical canal to stop it. The Cook Cervical Ripening Balloon contains two balloons; it is inserted into the canal before labor in a prolonged pregnancy in which the cervix is unfavorable for induction (6,7).

In this case report, we aim to present how we stopped cervical canal bleeding in a patient with placenta previa after Cesarean delivery by placing the Cook Cervical Ripening Balloon in the cervical canal and how doing so prevented the need for a Cesarean hysterectomy. We also aim to draw attention on this subject.

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CASE

A 23-year-old, 31-week pregnant woman was brought to the emergency clinic by ambulance with complaint of vaginal bleeding. She had a prior vaginal delivery, but had been diagnosed with placenta previa for her current pregnancy. Bleeding from the cervical canal was observed upon vaginal examination. The ultrasonographic evaluation revealed an intrauterine fetus compatible with a 32-week pregnancy. The fetus had deep bradycardia. The patient was transferred to the operating room for an emergency Cesarean delivery with a diagnosis of fetal bradycardia and placental decolman. Hypotension and tachycardia occurred in the patient at the beginning of the surgical procedure. A live male fetus weighing1880 grams with an Apgar score of 9 at the fifth minute was delivered by Pfannenstiel incision, and a low segment transverse uterine incision.

The placenta was completely removed without any complications. There was no sign of placental invasion anomalies. Bleeding from the lower uterine segment was within normal limits. The incision was closed within the anatomic folds. During surgery, 40 units of oxytocin and 0.25 mg methylergonovine were administered as uterotonic agents. During surgery, as soon as the patient's hemoglobin (Hgb) level was detected as 5.5 gr/dl, 2 units of red blood cells, two units of fresh frozen plasma, and 1 g fibrinogen were transfused intraoperatively. Moreover, 2 ampoules of calcium gluconate infusion were administered after the detection of low blood calcium levels during the procedure.

The operation was completed without any complications. Vaginal examination was performed at the end of the operation to evaluate if there was any excess bleeding. Abnormal bleeding from the cervix was observed. We observed that the bleeding stopped when we applied pressure on the cervix with a retractor. When the retractor was pulled back, bleeding started again (**Figure 1A, B**).

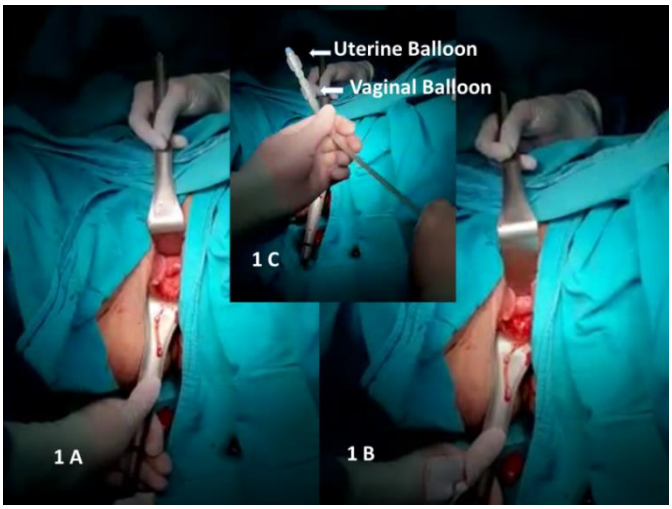

Figure 1. Vaginal bleeding. **A)** When the retractor was press on the cervix, the bleeding stopped. **B)** When the retractor was drawn back, the bleeding started from the cervix. **C)** The Cook Cervical Ripening Balloon.

Based on this finding, the origin of bleeding was thought to be the cervical canal, not the lower uterine segment. Thus, we thought that placing a Bakri balloon or urinary catheter in the lower uterine segment would be ineffective for stopping the bleeding. To achieve that aim, we decided to apply pressure to the cervical canal with the help of the Cook Cervical Ripening Balloon, which is used in a prolonged pregnancy to achieve cervical ripening before inducing labor. The Cook Cervical Ripening Balloon has two balloons; one is inserted into the uterine cavity, and the other is inserted into the vagina (Figure 1C). When the two balloons are inflated, such as with a saline infusion, the balloons are placed in the cervical canal and apply pressure on it. The Cook Cervical Ripening Balloon was placed into the patient's uterine cavity (**Figure 2A,B, Appendix 1**).

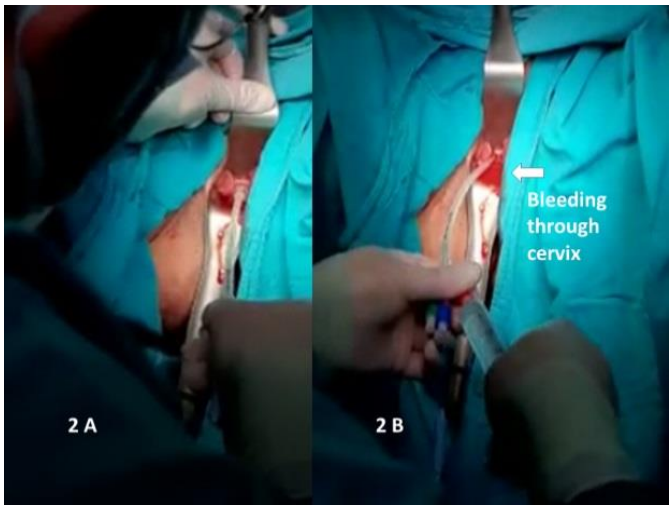

Figure 2. A) Administration of the Cook Cervical Ripening Balloon. **B)** Inflation of the Cook Cervical Ripening Balloon.

Appendix 1. Video showing vaginal bleeding and administration of the Cook Cervical Ripening Balloon.

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The uterine balloon was inflated with 80 cc of saline infusion, and then the cervical balloon was inflated with 60 cc of saline infusion.

After the procedure, the bleeding stopped, and the patient was transferred to the intensive care unit (ICU). In the ICU, the patient's hemoglobin level was detected as 7.8 gr/dl, and 2 units red blood cells and 2 units fresh frozen plasma were transfused. Twelve hours after the Cesarean section, 6000 units of enoxaparin were administered subcutaneously for prophylaxes of venous thromboembolism. In the follow-up in the ICU, the patient's vital signs were stable, so she was transferred to the clinic on the postoperative of first day. The saline solution used in the balloons of the Cook Cervical Ripening Balloon was drained step-by-step. During observation, no complications were seen, and the patient was discharged at the postoperative of the third day in a healthy condition.

DISCUSSION

Obstetric bleeding secondary to placenta previa can be life-threatening and is a frequent cause of postpartum hysterectomy. Bleeding originates from the lower uterine segment, where the contractile capacity of the thin myometrium is limited. Additionally, larger vessels are developed to supply the placental bed. Therefore, life-threatening bleeding may occur after placental removal, which can be a challenge for obstetricians (8).

Sometimes, an obstetrician must perform a hysterectomy to minimalized maternal morbidity, and even prevent mortality. The risk of undergoing a hysterectomy following a Cesarean delivery is 30-times higher for patients with placenta previa than those without placenta previa, requiring a longer hospital stay (9).

In some cases, bleeding can be stopped by applying pressure to the lower uterine segment by placing a Bakri balloon, two autonomous Zhukovsky balloon catheters, and a Foley balloon tamponade. However, these are not placed in the cervical canal and cannot stop bleeding from that canal. The effectiveness of the Cook Cervical Ripening Balloon for stopping cervical canal bleeding is supported in the literature (6).

In some cases of placenta previa, the placenta could reach the internal cervical os and the upper part of the cervical canal, leading to increased vascularization and adequate placental blood supply (6). Furthermore, Young et al. reported a case in which the placenta tissue protruded through the cervical os in a patient with placenta previa (10).

After placental removal, massive bleeding occurred due to a larger vascular bed at the internal cervical os and the upper part of the cervical canal, which was unrelated to the uterine cavity. In this case, the Cook Cervical Ripening Balloon seems to be an effective tool that can be implemented into the cervical canal to stop bleeding. Gu et al. evaluated the Cook Cervical Ripening Balloon's efficacy during surgery in a patient with placenta previa and placenta accreta spectrum disorder in which an abnormal invasive placenta reached the cervical internal ostium and the upper part of the cervical canal (6).

In the control group (n = 39), they placed an infrarenal abdominal aorta balloon occlusion and a longitudinal parallel compression suture to the lower uterine segment (6). In the study group (n = 35), the Cook Cervical Ripening Balloon was inserted into the cervical canal (6). Based on the results, they suggested that the Cook Cervical Ripening Balloon implantation is a simple and effective method for stopping bleeding from the cervical canal in some patients (6). Their suggestion supports the result of our case report.

CONCLUSION

The Cook Cervical Ripening Balloon can stop bleeding by exerting pressure on the blood vessel that originates at the cervical canal. In the case report presented here, we demonstrated the effectiveness of the Cook Cervical Ripening Balloon in stopping cervical canal bleeding in a patient with placenta previa who had undergone a Cesarean delivery. We recommend using the Cook Cervical Ripening Balloon to treat bleeding from the cervical canal based on previous reports of its efficacy in the literature and our experience. However, more research is needed to obtain further information about the effectiveness of the Cook Cervical Ripening Balloon for stopping cervical canal bleeding.

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Ethical approval: All procedures performed in studies involving human participants were in accordance with the institutional and/or national research committee's ethical standards and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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