



CASE REPORT

Hysteroscopic resection of retained products of conception combined with uterine artery balloon occlusion: A novel case report

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Abstract

Retained products of conception can cause massive bleeding that can be prevented by uterine artery embolization before resection; however, uterine artery balloon occlusion is less invasive. While scattered reports of its use for postpartum hemorrhage exist, no indications have been described. We report a case of hysteroscopic resection of retained products of conception using uterine artery balloon occlusion instead of uterine artery embolization. A 29-year-old woman, gravida 2 para 0, noted an intrauterine mass after an abortion at 7 weeks' gestation. Follow-up visits showed insufficient lowering of human chorionic gonadotropin levels, necessitating surgical treatment. Considering the patient's desire to conceive, we performed uterine artery balloon occlusion to reduce the risk of perinatal complications associated with uterine artery embolization. The operation was completed without complications. The patient conceived spontaneously and had a live baby 7 months after surgery, thus proving the benefits of uterine artery balloon occlusion before hysteroscopic resection.

KEYWORDS

balloon occlusion, hysteroscopy, placenta, uterine artery embolization

INTRODUCTION

Retained products of conception (RPOC) can cause massive bleeding if the blood flow is abundant and may result in hysterectomy for life-saving hemostasis.¹ Uterus-preserving therapies include methotrexate therapy² and hysteroscopic resection.³ Uterine artery embolization (UAE) is occasionally used to prevent massive bleeding.⁴ Although it is mostly a safe procedure, temporary blockage of the uterine artery is a less invasive option. Therefore, resuscitative endovascular balloon occlusion of the aorta, a technique used to control the distal arterial blood flow by inserting a balloon catheter through a sheath placed in the aorta, is often performed to prevent hemorrhage during a cesarean section in patients with placenta percreta/previa.⁵ However, the utilization of hysteroscopic resection of RPOC with uterine artery balloon occlusion has not been previously reported. We describe a woman who underwent balloon occlusion instead of UAE before RPOC removal.

CASE PRESENTATION

A 29-year-old woman, gravida 2 para 0, with a spontaneous pregnancy underwent uterine evacuation using a manual vacuum aspiration kit (Women's Health Japan) owing to a missed abortion at 7 weeks' gestation. Two weeks after the procedure, a 2.9 cm uterine mass with abundant blood flow was observed on transvaginal color Doppler ultrasound sonography. The blood human chorionic gonadotropin (hCG) level was 935 IU/L, and magnetic resonance imaging with contrast enhancement of the uterus revealed a mass sized 2.2 × 2.9 × 2.6 cm (Figure 1), which was identified as a placental polyp. The patient was presented with two treatment options: surgery or observation. After being informed of the advantages and disadvantages of each option, the patient chose observation. During the first 4 weeks of follow-up, there was no genital bleeding, and the blood hCG level decreased steadily; however, after the fifth week, the hCG level stagnated at approximately 45 IU/L. Ultrasound tomograms showed that the blood flow to

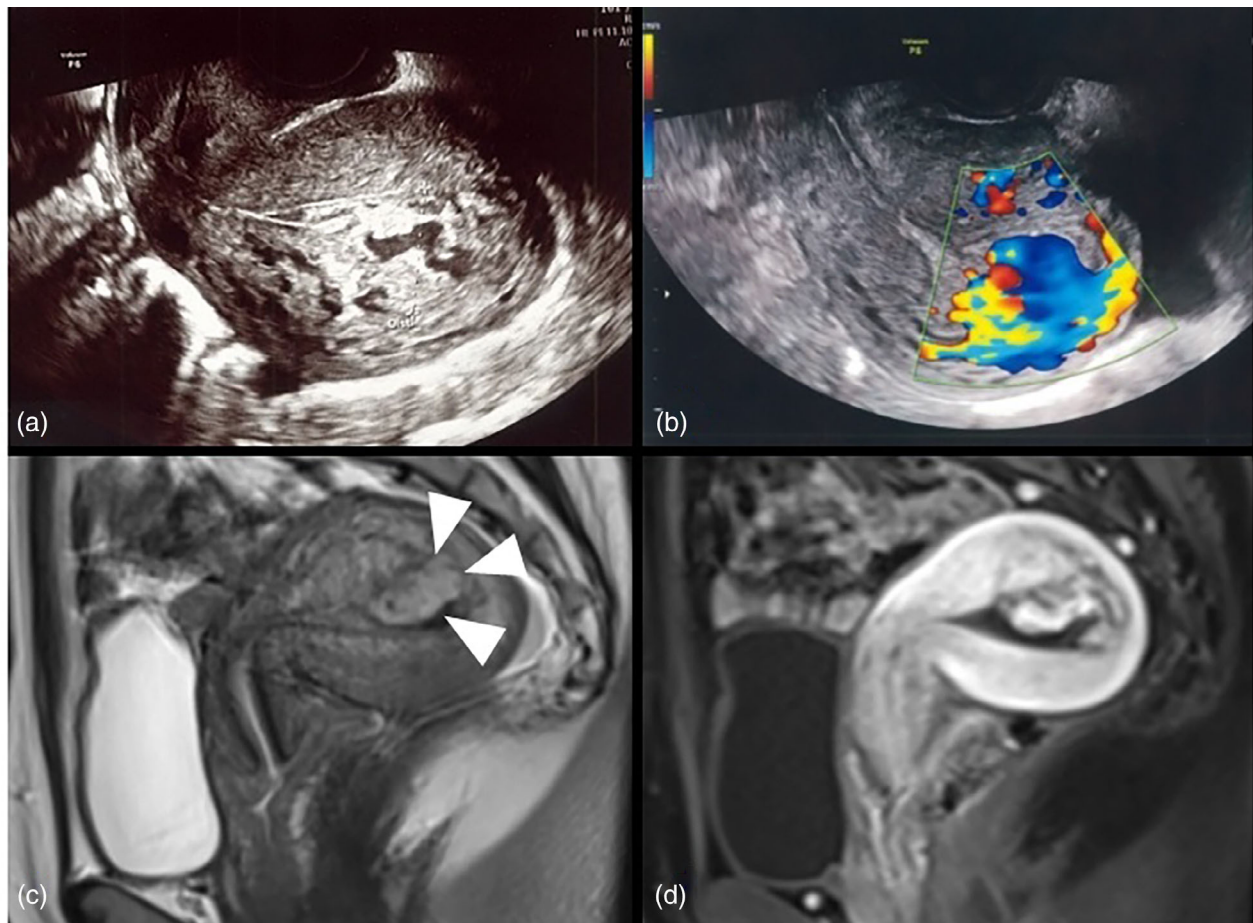


FIGURE 1 Ultrasonographic and magnetic resonance (MR) images obtained 2 weeks after the dilatation and curettage. (a) Transvaginal grayscale ultrasonogram shows a 2.9 cm mass in the uterus. (b) Transvaginal color Doppler ultrasonogram shows abnormal blood flow to the mass. (c) Sagittal T2-weighted MR image shows a $2.2 \times 2.9 \times 2.6$ cm mass (arrowheads) occupying the uterus. (d) Contrast-enhanced MR image of the mass

the mass remained high. Although there were genital bleeding, a wait-and-watch strategy was adjudged inappropriate, and a surgery was performed.

First, in the fluoroscopy room, the radiologist accessed the bilateral common femoral artery using a 5-French sheath. Contrast-enhanced angiography confirmed the dilatation of the bilateral uterine arteries and the presence of a mass with vascular growths (Figure 2a). A 2-Fr tip microballoon catheter (Pinnacle Blue 20; Tokai Medical Products Inc., Aichi, Japan) was placed in the common trunk of the uterine artery and the inferior gluteal artery on the left side and in the area where the uterine artery could be selectively occluded on the right side to block the blood flow of the nutrient vessel to the RPOC (Figure 2b). The patient was moved to the operating room and placed in the lithotripsy position. The balloon position was fluoroscopically confirmed by a radiologist using a surgical X-ray system SIREMOBIL COMPACT L (SIEMENS Healthineers, Erlangen, Germany) before the balloon was dilated. After confirming the absence of blood flow

by transvaginal color Doppler ultrasound (Figure 3a), hysteroscopic resection of the RPOC was performed (Figure 3b–d) using a continuous flow 24-Fr resectoscope with a 4 mm 30° rod lens (OES ELITE; Olympus Corp., Tokyo, Japan) and a U-shaped bipolar cutting loop (WA22306D; Olympus Corp.). Saline was used for distention and irrigation of the uterine cavity. Blood flow was interrupted for 31 min. Deflating the balloon after the RPOC resection did not increase bleeding. The sheath was removed in the operating room, and the sheath puncture site was compressed to stop the bleeding. The operation time was 60 min, and the bleeding was minimal. Histopathological examination of the mass revealed degenerated and necrotic chorionic structures. The mass was identified as a placental polyp. The patient had no postoperative complications and was discharged on the second postoperative day. Menstruation resumed at 1 month postoperatively, and the patient conceived spontaneously at 7 months postoperatively. She gave birth without perinatal complications.

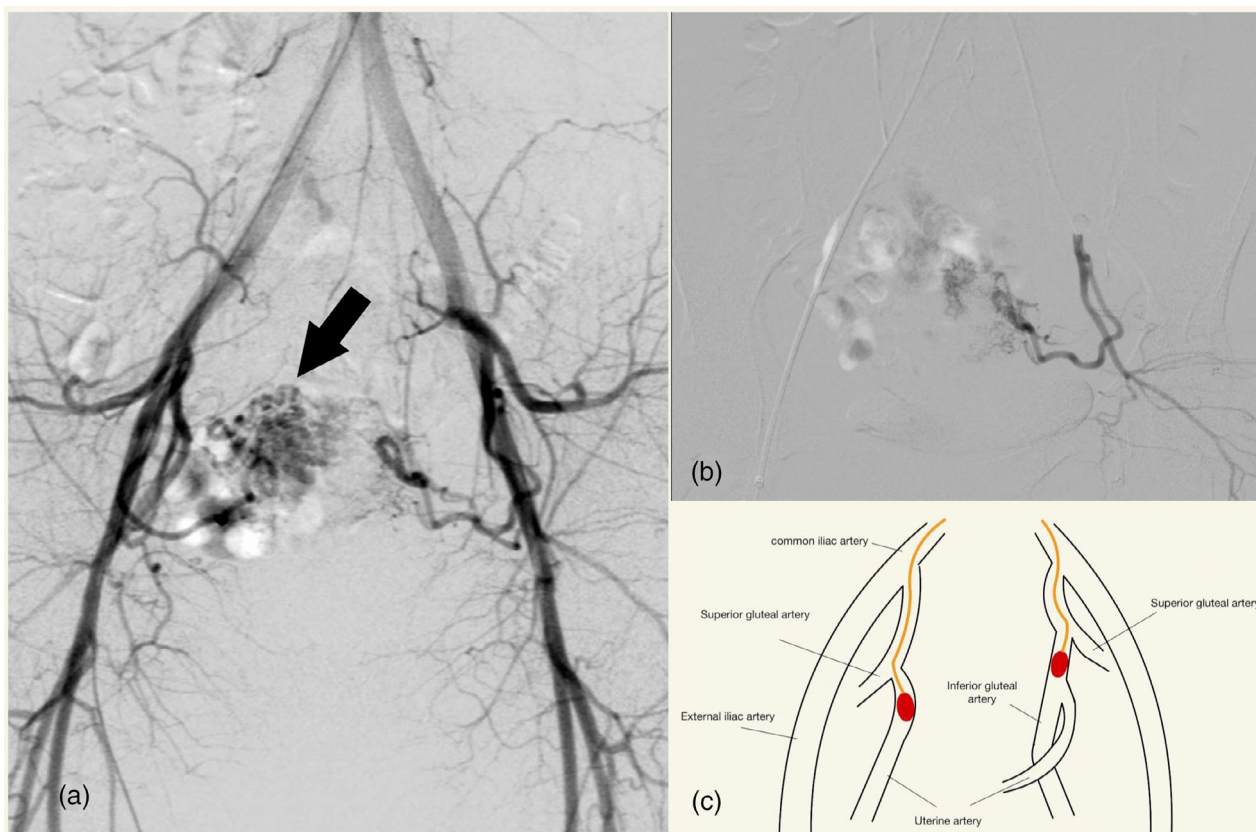


FIGURE 2 Contrast-enhanced angiography. (a) Contrast-enhanced angiography confirms dilatation of the bilateral uterine arteries and the presence of a mass (arrow) with vascular growths. (b) After balloon placement. The blood vessels flowing into the mass are blocked. (c) Anatomical illustration showing balloon occlusion location. The yellow line indicates the catheter, and the red circle indicates the balloon

This case report was approved by the Ethics Committee of Nippon Medical School (No.653-4-27). Written informed consent was obtained from the patient to publish this case report and any accompanying images.

DISCUSSION

Our report highlighted two important clinical issues. First, hysteroscopic resection of RPOC can be performed safely after uterine artery balloon occlusion. Second, the patient conceived spontaneously 7 months after the surgery and later delivered a full-term baby without perinatal complications.

The management of RPOC with high blood flow is controversial, with some reports suggesting that they can be managed by close observation or dilatation and curettage.⁶ However, the observation period lasts an average of 68 days and dilatation and curettage can result in massive intraoperative bleeding.^{7,8} Considering our patient's desire to have a baby, we performed hysteroscopic resection after uterine artery blockade. Although UAE is the most common method of controlling blood flow to RPOC, we chose uterine artery occlusion instead of UAE.

The prognosis after UAE for obstetric hemorrhage is generally good, with a reported menstrual resumption rate of 91.4% and pregnancy rate of 77%.⁹ Nevertheless, the temporary interruption of blood flow to the endometrium causes uterine lumen adhesions and an increased incidence of placenta accreta.¹⁰ This may be attributed to the ischemia caused by the interruption of blood flow to the uterus due to UAE, which could result in impaired regeneration of the endometrium. A review of prophylactic hemostatic procedures for the treatment of placenta accreta also demonstrated that UAE causes complications, such as postembolization syndrome, uterine or vaginal necrosis, uterine artery dissection, and sensory abnormalities in 9%–13% of the patients. In contrast, balloon occlusion of the common iliac arteries is considered safe if the occlusion time is less than 90 min.¹¹ Considering these points and the patient's strong desire to conceive, we employed balloon occlusion instead of UAE for blood flow interruption before hysteroscopic resection. There was no postoperative genital bleeding, and menstruation resumed promptly after the surgery. Furthermore, the patient conceived spontaneously and gave birth to a baby. To our knowledge, this is the first case wherein hysteroscopic resection of RPOC combined with balloon occlusion was performed.

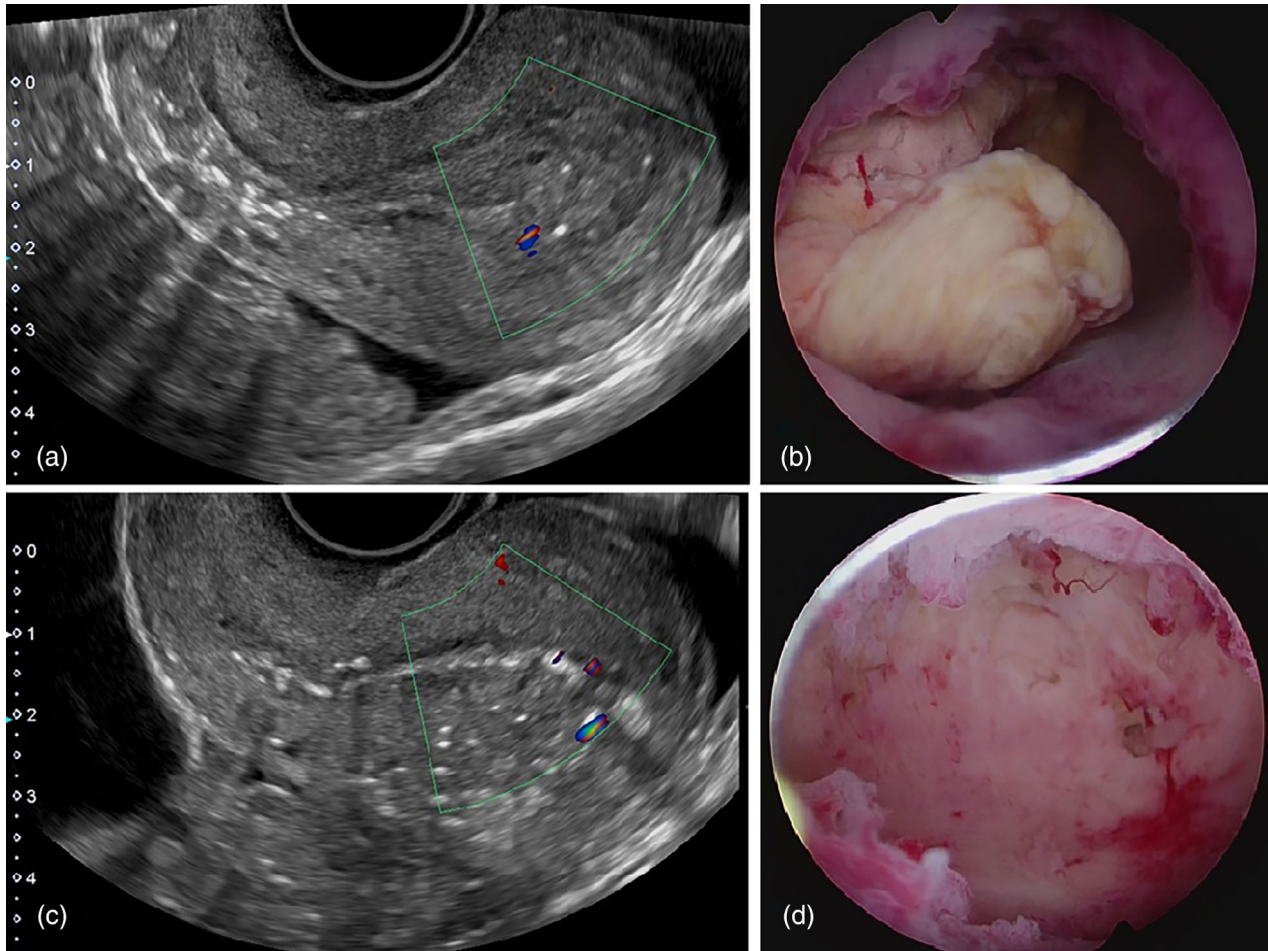


FIGURE 3 Hysteroscopic and postoperative ultrasound images. (a) Transvaginal color Doppler ultrasound after balloon dilation. Decreased blood flow can be seen. (b) Hysteroscopy shows a mass protruding into the uterus. (c) Transvaginal color Doppler ultrasound shows no abnormal blood flow and disappearance of the retained products of conception. (d) The mass was resected without bleeding using a resectoscope

Complications of balloon occlusion include vascular injury, vascular rupture, and balloon rupture during balloon inflation.¹² In addition, a rapid decrease in afterload during balloon deflation, rebleeding, and ischemia–reperfusion injury can occur.¹³ These require the skill of a radiologist, which may limit the facilities where this procedure can be performed. In addition, the balloon placement may be misaligned, resulting in inadequate hemoperfusion. It is also possible that the development of collateral blood vessels and other factors may prevent the balloon from providing sufficient blood flow blockage on its own, and additional procedures are required.

Even with these complications of balloon occlusion, balloon occlusion has significant advantages over UAE in effectively controlling the time of hemoperfusion. Therefore, it is a safe alternative to UAE for blocking blood flow before hysteroscopic RPOC resection. Patient selection for balloon occlusion should be discussed in future case studies. Further follow-up and investigation studies are required to determine postoperative perinatal prognosis and indications for treatment options.

CONCLUSION

In this report, uterine artery balloon occlusion was performed before hysteroscopic resection of RPOC in a patient who wished to preserve her fertility. She conceived spontaneously and gave birth to a live baby without perinatal complications. Therefore, balloon occlusion may be considered a safe and effective substitute for UAE to facilitate blood flow interruption in such patients.

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CONFLICT OF INTEREST

The authors declare no conflict of interest for this article.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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