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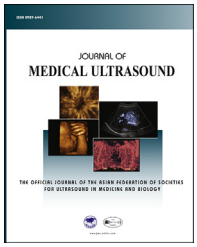

CASE REPORT

Use of Intrauterine Balloon Tamponade Test to Determine the Feasibility of Dilation and Evacuation as a Treatment for Early Uterine Artery Pseudoaneurysm

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Abstract Uterine artery embolization is the most common treatment for uterine vascular abnormalities. Herein, we report the successful use of dilation and evacuation as a treatment for uterine artery pseudoaneurysm. A 36-year-old woman complained of vaginal bleeding after an uncomplicated vaginal delivery. Ultrasonography showed a 12.8-mm anechoic area inside the uterus. Color Doppler revealed a to-and-fro sign, indicating an arteriovenous malformation. A blood test showed a low level of human chorionic gonadotropin. Therefore, a diagnosis of early uterine artery pseudoaneurysm following spontaneous delivery was suspected. Under monitoring with transabdominal color Doppler sonography, intrauterine balloon tamponade induced complete disappearance of abnormal blood flow. With bleeding determined to be under control with balloon tamponade, dilation and evacuation was performed. The patient had a favorable postoperative course.

Introduction

Uterine artery pseudoaneurysm (UAP) is an acquired abnormal blood vessel-like space formed from a leak of a uterine artery branch and accumulation of thrombus. Most UAPs occur inside the uterus; caesarean delivery [1] and traumatic abortion procedures such as dilatation and curettage [2,3] are the major causes of this disorder. However, UAP

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also occurs after nontraumatic vaginal delivery [4,5]. It has been reported that rupture of a large UAP can cause massive hemorrhage. Recent studies reported that 94.1—100% of UAP cases were successfully treated with uterine artery embolization (UAE) [5,6]. UAP might appear in the form of a small vascular malformation at a very early stage, but there are no criteria suggesting how large a UAP must be for UAE treatment. Herein, we report a case of a small UAP that presented after spontaneous delivery, with successful treatment by performing dilation and evacuation (D&E) following a blood flow suppression test, using an intrauterine balloon (intrauterine balloon tamponade test; IBTT).

Case Report

A 36-year-old woman (gravida 4, para 2) with no significant medical history was referred to our hospital due to irregular vaginal bleeding. Three months prior, she had an uneventful spontaneous delivery of a male infant weighing 3295 g at Gestational Week 39. At Postpartum Day 37, she had a routine ultrasonography examination and no abnormality was found. At Postpartum Day 83, she was referred to a clinic doctor due to slight irregular vaginal bleeding, and was administered norgestrel—ethinylestradiol combination tablets after a negative urine pregnancy test. The slight bleeding stopped but recurred a few days later. Vaginal examination at our hospital could not confirm any active bleeding, except for some dark brown discharge. Transvaginal ultrasonography revealed a 7-mm gestational sac-like anechoic area inside the endometrial cavity (Figure 1A). A urine pregnancy test was weakly positive, and a suspected abortion was considered, despite the patient's strong denial of the possibility of pregnancy. One week later, the anechoic area had grown to 9.6 mm, but no yolk sac was found. However, intermittent genital bleeding persisted in the following 2 weeks. Subsequent ultrasonography showed the gestational sac-like anechoic area had grown to 12.8 mm, with the absence of either a yolk sac or fetal heart beat (Figure 1B). Simultaneous serum human chorionic gonadotropin (hCG) testing showed a level of 12 mU/mL, which negated the possibility of a normal pregnancy. Inside the sac, whirling fluid flow could be clearly observed in gray-scale transvaginal sonography. In addition, color Doppler (Siemens, SONOVISTA FX (Siemens Healthcare, Korea); peak systolic velocity: 17.9 cm/s) clearly revealed a to-and-fro sign, indicating an intrauterine arteriovenous malformation (Figure 1C, Video 1). Therefore, a diagnosis of vascular abnormality associated with persistent hCG [7]—probably UAP due to retained products of conception [8,9]—was considered. Although her hemoglobin level was 13.5 g/dL, bleeding continued and the UAP had grown in the previous 3 weeks. Therefore, treatment was considered necessary. After obtaining informed consent, we decided to perform an intrauterine blood flow suppression test to determine whether D&E could be used to treat this case. Firstly, we inserted a 14-Fr Foley catheter with the leading edge removed into the uterine cavity in an operating room with available anesthetic personnel and equipment. Next, under monitoring with transabdominal color Doppler sonography, sterile water was injected into the balloon to determine whether blood flow could be suppressed by balloon compression. As the balloon expanded, the blood flow started to diminish, and completely disappeared when the full 10 cc was injected (Figure 1D, Video 2). With evidence that the bleeding could be controlled through balloon compression, D&E under sedation was subsequently performed. Although a balloon was prepared to control the hemorrhage, active bleeding completely stopped during the operation after 0.2 mg of intravenous methylergometrine was administered. Therefore, replacement balloon tamponade was not performed. The patient had a good postoperative course and was discharged on the same day after surgery. There was no recurrence by the 4-week follow-up examination. On pathological examination, few chorionic villi were observed in the specimen. In addition, the lesion consisted of numerous irregular vessel-like channels surrounded by hyaline fibrosis (Figure 2A). Although loose connective tissue was found in a large pseudoaneurysmal wall, neither elastic fibers nor elastic lamina could be identified on Elastica-van Gieson staining (Figure 2B).

Supplementary video related to this article can be found at http://dx.doi.org/10.1016/j.jmu.2016.08.002.

Discussion

Curettage of an unknown vascular abnormality can lead to massive hemorrhage. Most reports suggested that UAE should be used for such vascular abnormalities, regardless of their size. Although Ju et al [7] reported successful dilation and curettage with minimal vaginal bleeding in three cases, the feasibility of such procedures is unknown. Herein, we report our experience with D&E for treatment of a small UAP with persistent hCG. We suggest that when D&E is being considered for a small lesion, an IBTT might be useful to determine its feasibility.

Rupture of vascular abnormalities, including congenital arteriovenous malformations, arteriovenous fistulas, true aneurysms, and pseudoaneurysms can lead to a life-threatening situation. Antebi et al [10] reported that an arteriovenous fistula following uterine surgery may cause massive vaginal bleeding. To treat such uterine vascular abnormalities, Zimon et al [11] first reported successful treatment of a UAP measuring 35 mm with UAE. Lin et al [12] subsequently reported use of UAE on a UAP with a low hCG level after a termination of pregnancy. Subsequently, regardless of size, UAP has been treated with UAE after enhanced computed tomography (CT) and transcutaneous angiographic examination in most reported cases in recent years [6]. Despite some unsuccessful experiences requiring a hysterectomy [13], the success rate of UAE for UAP is generally high, and the time to complete hemostasis is shorter than for postpartum hemorrhage with severe coagulation disorders, such as placental abruption [14]. The outcome of UAE for UAP is considered favorable [5]. However, in view of postoperative complications such as fever and severe lower abdominal pain [15], and the potential risk of perforation and vasospasm [16] during the procedure and diffuse uterine synechiae [17], it is questionable to conclude that UAE is the preferred treatment for UAP in all cases.

Two decades prior, with the availability of color Doppler sonography, studies concluded that pelvic arteriovenous malformation can be easily diagnosed without the need for

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