Prominent Decidual Vasculature Overlying the Internal Cervical Os: An Entity Potentially Leading to Acute Life-threatening Antepartum Hemorrhage

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We report a new entity of prominent decidual vasculature overlying the internal cervical os which caused life-threatening antepartum uterine bleeding in a rhesus (Rh) D-negative patient at 32^{+5} weeks' gestation. Cesarean hysterectomy was performed because of diffuse placenta increta. Early hospitalization, advanced preparation for emergency cesarean section, and timely blood transfusion, including 2 L of RhD-positive packed red blood cells, aided in saving the lives of the patient and her baby. To the best of our knowledge, the ultrasound findings of this condition have never been reported. This condition could be considered as an independent sign for identification of a patient who is potentially at risk of acute massive antepartum hemorrhage. It deserves early accurate diagnosis by obstetricians using transvaginal sonography with color Doppler analysis. [*J Chin Med Assoc* 2010;73(4):216–218]

Key Words: antepartum hemorrhage, color Doppler, decidual vasculature, placenta increta

Introduction

Even with the availability of advanced techniques and knowledge in obstetrics, massive hemorrhage remains one of the leading causes of maternal mortality.[1] Antepartum hemorrhage is often associated with placenta abruptio, placenta previa, or vasa previa. In this case report, we present another condition, prominent decidual vasculature overlying the internal cervical os, which resulted in antepartum hemorrhage that varied from mild vaginal spotting to acute massive bleeding over 4 weeks. Placenta increta and worsening intrapartum hemorrhage were noted unexpectedly during cesarean section.

Case Report

A 28-year-old woman, gravida 2, para 0, was referred to our hospital at 28^{+5} weeks' gestation with a complaint of mild vaginal bleeding for several days. She had a history of uterine curettage at 12 weeks' gestation. Her vital signs were unremarkable, with a hemoglobin level of 11.5 g/dL. She was blood group O, rhesus (Rh) D negative. Results of Coombs test and anti-RhD antibody screening were negative. She was given RhD immune globulin to prevent RhD alloimmunization. No cervical lesion was identified on speculum examination. Transabdominal color sonography revealed a posterior placenta with no sign of vasa previa. Two decidual vessels, 1 artery and 1 vein, overlying the internal cervical os were accidentally detected by transvaginal color Doppler sonography with a 4–8-MHz curved array transducer (Philips HD, Bothell, WA, USA) (Figure 1). Mild irregular uterine contractions with no signs of fetal distress were displayed on electronic fetal monitoring.

In view of a potential risk of rupture in the decidual vessels during uterine contractions, she was hospitalized for close observation, tocolysis and advanced preparation for an emergency cesarean section. The patient felt well during hospitalization but still suffered from intermittent mild vaginal bleeding. She was given a course of dexamethasone to enhance fetal maturity at 31 weeks' gestation. Unfortunately, massive

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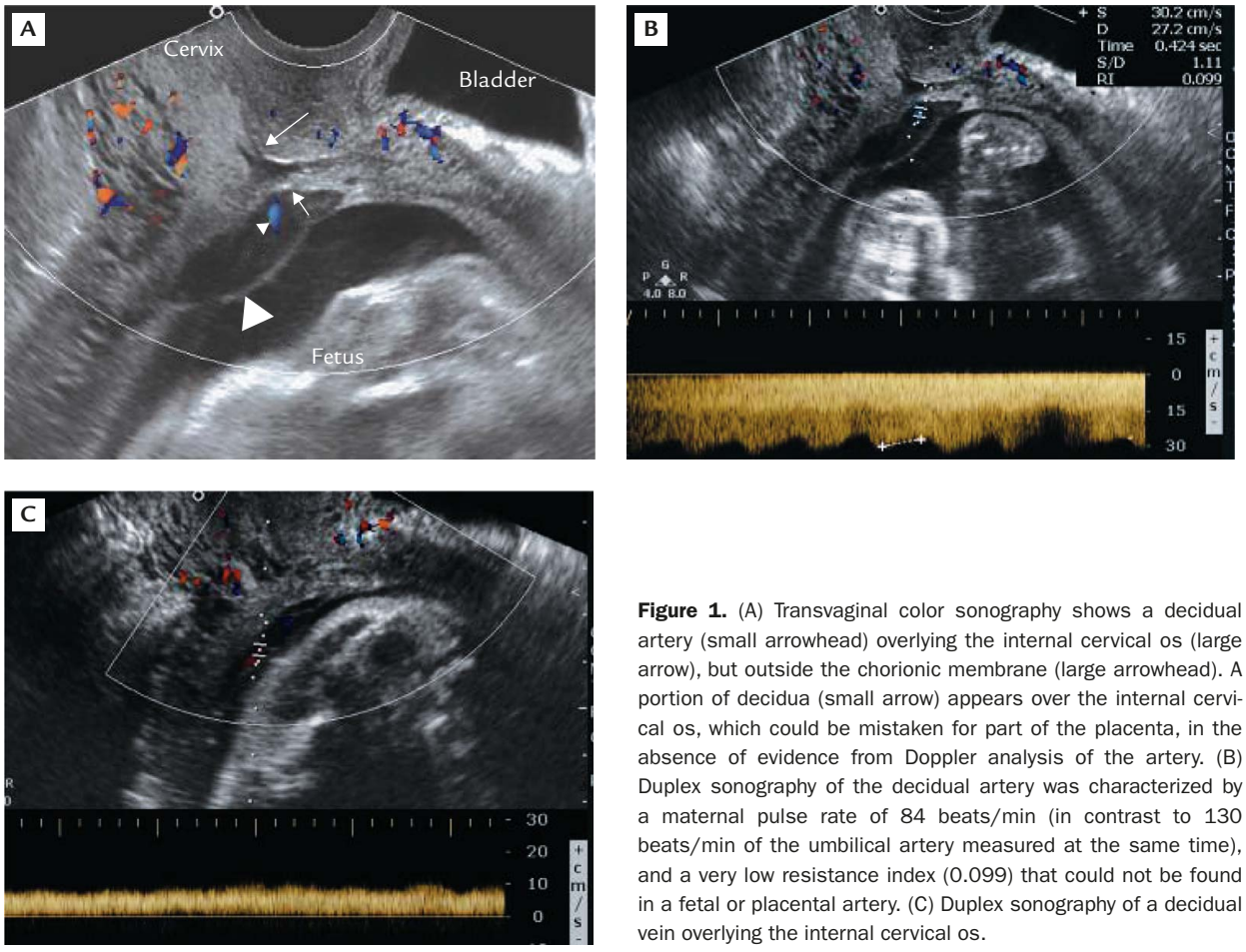

Figure 1. (A) Transvaginal color sonography shows a decidual artery (small arrowhead) overlying the internal cervical os (large arrow), but outside the chorionic membrane (large arrowhead). A portion of decidua (small arrow) appears over the internal cervical os, which could be mistaken for part of the placenta, in the absence of evidence from Doppler analysis of the artery. (B) Duplex sonography of the decidual artery was characterized by a maternal pulse rate of 84 beats/min (in contrast to 130 beats/min of the umbilical artery measured at the same time), and a very low resistance index (0.099) that could not be found in a fetal or placental artery. (C) Duplex sonography of a decidual vein overlying the internal cervical os.

vaginal bleeding, coinciding with only mild uterine contractions, suddenly occurred at 32^{+5} weeks' gestation. The blood loss was estimated to be > 1.5 L within 20 minutes. Cesarean section was performed immediately because of unstable hemodynamic status. An 1,850-g female infant was delivered, with Apgar scores of 3 and 7 at 1 and 5 minutes, respectively. Total hysterectomy was performed because it was difficult to remove the placenta during the operation (Figure 2). Placenta increta was confirmed histologically. The blood loss during the operation was estimated to be > 2.5 L. The patient received 10 U fresh frozen plasma and 3 L packed red blood cells (RBCs), including 2 L RhD-positive packed RBCs as a result of the lack of stored RhD-negative RBCs. Pink urine that contained uric acid precipitation, and mildly elevated serum levels of total bilirubin (2.6 mg/dL) and lactate dehydrogenase (404 U/L) were observed for 1 day after blood transfusion. There was no other sign of significant hemolysis during the postpartum period. Postoperative adynamic ileus occurred and was resolved after conservative management. The patient was discharged home on postpartum day 7. Three months later, she and her baby remained healthy.

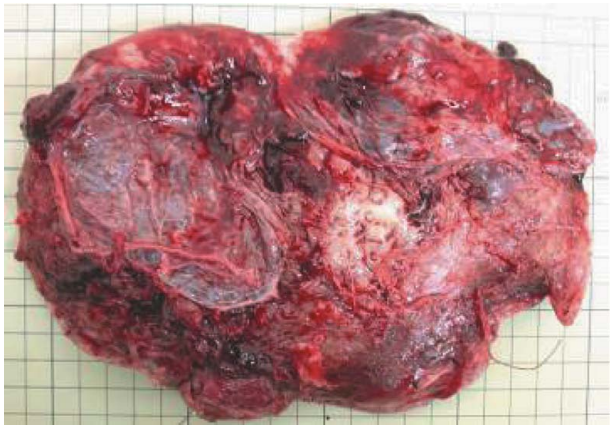

Figure 2. Photograph of the uterus with diffuse placenta increta after hysterectomy.

Discussion

In contrast to vasa previa, fetal vessels that run through the chorionic membrane over the internal cervical os, decidual vasculature that overlies the internal cervical os are invariably outside the chorionic membrane.

In the present case, duplex sonography of the decidual artery was characterized by pulse rates of 84 beats/min, which was consistent with maternal heart beat, but lower than the fetal heart rate of 140 beats/min. In addition, a very low resistance index of 0.099 could not be detected in fetal or placental vessels. To the best of our knowledge, the ultrasound findings of prominent decidual vessels overlying the internal cervical os, possibly called decidual vasculature previa, have not been reported previously. It could be considered as an independent identification sign indicating a patient who might suffer from life-threatening antepartum hemorrhage, which could occur without specific causes such as heavy lifting, falling, cough, strenuous effort, or significant uterine contractions. The potential risk of vascular rupture in this condition is great enough to warrant accurate early diagnosis, advanced preparation for an emergency cesarean section, and timely blood transfusion. To deal with unexplained antepartum bleeding, we strongly recommend the application of transvaginal sonography with color Doppler analysis. Decidual vessels overlying the internal cervical os might be overlooked by routine transabdominal or transvaginal sonography without color Doppler analysis.

At present, no single diagnostic technique can completely confirm or exclude placenta accreta before delivery,[2,3] particularly in patients with a posterior placenta. Diagnosis of placenta accreta is often made during the third stage of labor or at cesarean delivery,[3] especially in a primigravida. In normal implantation, extravillous endovascular cytotrophoblast invades the uterine spiral artery and replaces the muscular layer, which leads to a dilated lumina with a low-resistance blood flow.[4] Cases of placenta increta or percreta are associated with deep invasion but defective vascular remodeling, which is characterized by a portion of vessel wall that lacks replacement by trophoblast.[4] It is well known that engorged vessels always appear on the uterine surface near the site of placenta increta, perhaps as a compensation for the defective vascular remodeling. Similarly, in the present case, the appearance of a dilated, low-resistance decidual artery overlying the internal cervical os was probably a sign or reflection of placenta increta nearby. Whether or not such a sign is related to placenta increta or both this new sign and placenta increta occurring in tandem, by chance, needs further investigation.

Phagocytosis of RhD-positive RBCs by macrophages through phosphatidylserine receptors can occur in the red pulp of the spleen.[5] After injection of RhD immune globulin, IgG-labeled RhD-positive RBCs induce faster phagocytosis through Fc receptors. Neither form of phagocytosis induces RhD alloimmunization. Alloimmunization against RhD antigen released from aging RBCs takes place in the white pulp of the spleen. In the situation of life-threatening hemorrhage, a woman who has not developed RhD alloimmunization can receive a considerable amount of RhD-positive RBCs, without the risk of immediate hemolysis. For women with RhD alloimmunization, delayed extravascular hemolysis caused by anti-RhD IgG often occurs 2–10 days after transfusion of RhD-positive RBCs. The hemolysis that is caused by RhD incompatibility is usually gradual and mild compared to that related to ABO incompatibility.

In conclusion, prominent decidual vasculature overlying the internal cervical os could be considered as an independent sign for identification of a patient who is potentially at risk of acute massive antepartum hemorrhage. It deserves early accurate diagnosis by obstetricians using transvaginal sonography with color Doppler analysis.

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