

PERINATAL/NEONATAL CASE PRESENTATION

Placenta accreta in a patient with a history of uterine artery embolization for postpartum hemorrhage

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Uterine artery embolization (UAE) is used to treat various conditions from uterine leiomyoma to uncontrollable bleeding. We describe a case of placenta accreta after a prior delivery, which required UAE to control a postpartum hemorrhage. This case highlights the importance of both antenatal evaluation of placentation and heightened precaution for delivery in subsequent pregnancies for women who have undergone this procedure.

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INTRODUCTION

Uterine artery embolization (UAE) is a technique that has been successfully used for uterus-conserving treatment of uterine fibroids, postpartum hemorrhage (PPH) and arteriovenous malformation.^{1–8} It is a relatively new, minimally invasive technique that when used effectively has the ability of sparing patients from surgery and even hysterectomy.

Preservation of uterine function and fertility has been demonstrated in case series.^{2–6} In compiled case reports of patients who have undergone UAE for leiomyoma, the effect on future pregnancy outcomes is not well studied, but increased rates of fetal malpresentation, intrauterine growth restriction, placenta accreta and preterm labor have been reported.^{2,3} In one large cohort of 555 women who underwent UAE for leiomyomata, abnormal placentation occurred in 3 nullipara (12.5%) out of 18 live births.² Another review of case reports by Goldberg *et al.*³ described 50 UAEs for leiomyoma. They reported a 22% spontaneous abortion rate, 13% PPH rate, 28% premature delivery rate and 58% subsequent cesarean section rate. Following UAE for intractable PPH, successful pregnancy outcomes have been reported with few adverse obstetric outcomes described.^{4,5} In this report, we present a case of placenta accreta requiring cesarean hysterectomy in a patient with a history of UAE at the time of prior cesarean delivery for postpartum hemorrhage.

CASE

A 37-year-old gravida 2, para 1 presented to our Labor and Delivery unit at 34 and 4/7 weeks gestation with complaints of labor. She denied prior history of uterine instrumentation, including dilatation and curettage and hysteroscopy. Her obstetric history is significant for a prior cesarean delivery in 2000 for arrest of dilation, which was complicated by PPH due to uterine atony, with an estimated blood loss of 2000 ml. The uterine hemorrhage failed to respond to conservative medical management, including bilateral O'Leary's uterine artery ligation, and eventually was successfully treated with bilateral UAE.

Upon presentation, preterm premature rupture of membrane was diagnosed. At her antenatal counseling, she had desired Trial

of Labor after Cesarean (TOLAC). However, on presentation to Labor and Delivery, ultrasound showed complete breech presentation and therefore she underwent a repeat cesarean delivery. Fetal heart tracing was reassuring.

The patient underwent an uncomplicated repeat cesarean delivery of a live male infant, with Apgar scores of 7 and 9 at 1 and 5 min, respectively. There was a complete uterine inversion with attempted delivery of the placenta. The uterine inversion was reduced and the placenta was then delivered manually. A focal placenta accreta was diagnosed at the left lateral fundus. This location was consistent with her 18-week obstetric ultrasound, which noted the placenta to be anterior/left lateral, with no evidence of placenta previa. After delivery of the placenta, diffuse bleeding was seen at the placental accreta focus, not amenable to conservative measures; thus, a cesarean hysterectomy was performed, after which her bleeding was well-controlled. Estimated blood loss was 2400 ml and her postoperative hematocrit was 20%, decreased from 37%, preoperatively. Immediately postoperatively, the patient did well with an unremarkable postpartum course and she did not require transfusion of blood products.

Gross evaluation of the uterus demonstrated a placenta accreta (Figure 1) and was confirmed with pathological examination (Figure 2), which described decidualized endometrium with focal areas of chorionic villi.

COMMENT

Here we present a case of placenta accreta at the time of repeat cesarean delivery in a patient with a history of UAE for intractable PPH. To our knowledge, our case report is one of the first detailing a placenta accreta following UAE for PPH. On the basis of our PubMed search of the literature using keywords 'uterine artery embolization and placenta accreta', we found numerous reports of abnormal placentation following UAE for leiomyomata. However, we were not able to find any reports detailing placenta accreta following UAE for PPH. The search for 'PPH and UAE and placenta accreta' similarly produced no examples of placenta accreta following UAE for PPH.

The pregnancy of the patient in this report was also complicated by malpresentation and preterm premature rupture

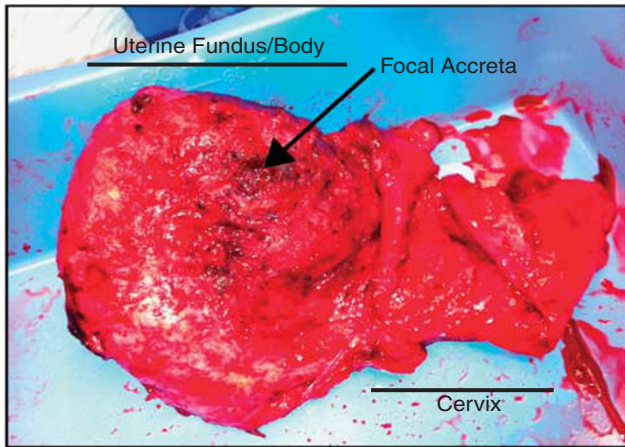


Figure 1. Photograph showing the endometrium of the uterus (inside-out) following hysterectomy with area of focal placenta accreta shown with arrow.



Figure 2. Representative cross-section of the uterus with hematoxylin and eosin stain, showing decidualized endometrium with focal areas of chorionic villi.

of membranes, consistent with some of the adverse pregnancy outcomes after UAE described in the literature. Although some of these complications have been shown after UAE for uterine leiomyoma, follow-up after UAE for PPH has shown only maintained fertility without major complications.^{4,5} In the retrospective cohort by Hardeman *et al.*,⁴ 53 patients were exposed to embolization for PPH, with no difference in fertility rates versus 106 non-embolized controls. In the long-term follow-up case series by Orman *et al.*,⁵ 28 patients underwent UAE for PPH, and all 6 of the 6 patients who desired future fertility were able to achieve uncomplicated term deliveries.

The cause for placenta accreta after UAE is not entirely clear, although focal myometrial necrosis has been noted after the use of certain embolization media.⁸ The hypothesized explanation of this abnormal placentation could be the endometrial damage as a result of compromised perfusion, leading to trophoblastic invasion in subsequent pregnancies. This patient had one prior cesarean delivery, complicated by PPH from uterine atony, with no abnormal placentation described. Although cesarean is a known factor for placenta accreta, the risk in a subsequent pregnancy not complicated by placenta previa is only 0.3%.⁸ The location of the placenta accreta in the lateral fundus of the uterus does not represent a classic presentation of cesarean delivery-associated

placenta accreta, which is commonly found in the lower uterine segment near the hysterotomy. Thus, the role of UAE, possibly in combination with bilateral uterine artery ligation, may have had a significant role in the pathogenesis of placenta accreta in this case. As the UAE was performed after the bilateral O'Leary uterine artery ligation, presumably, the embolization may have targeted collateral uterine circulation. It is not possible to distinguish the impact of each of these interventions toward uterine devascularization, which may have predisposed this patient to placenta accreta.

The increasingly reported incidence of abnormal placentation in the subsequent pregnancies after UAE highlights the importance of close monitoring of placental status in these patients. In this particular case, TOLAC was the planned mode of delivery. The placenta accreta was diagnosed at the time of repeat cesarean delivery performed for breech presentation. This case underscores the importance of evaluation for abnormal placentation during the antenatal period, with a heightened index of suspicion. Given that current imaging modalities have limited predictive value for diagnosing placenta accreta, appropriate preparations for delivery should take place, even in the absence of ultrasound or magnetic resonance imaging findings. Furthermore, UAE extends the risk of abnormal placentation to the entire placenta bed rather than only the site of prior cesarean scar, making diagnosis even more challenging. Although the magnitude of this risk is unknown, a planned delivery with a multidisciplinary care team in a tertiary care center should be considered in this group of patients, who may have increased risk for placenta accreta.

UAE is a valuable tool for the treatment of postpartum hemorrhage, and in many cases is capable of preserving fertility by preventing hysterectomy. This report highlights history of UAE as a potential risk factor for abnormal placentation in future pregnancies. As UAE has emerged as a commonplace in our armamentarium for the treatment of hemorrhage, appropriate antenatal evaluation of placentation and counseling for delivery planning should be considered in patients who have had this procedure.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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