Successful Management of a Case of Placenta Accreta Complicated with Retroperitoneal Hematoma and Severe Postpartum Hemorrhage by Transcatheter Arterial Embolization

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Placenta accreta is often encountered when attempting to manually remove the placenta after a vaginal delivery. Removing a placenta accreta by uterine curettage can result in uterus perforation, internal bleeding, retroperitoneal hematoma and intrauterine adhesions (Asherman syndrome). In this report, we discuss the use of transcatheter arterial embolization [TAE] to treat a case of placenta accreta complicated by retroperitoneal hematoma and severe uterine bleeding that may have been caused by uterine curettage. TAE is able to easily identify sources of bleeding, allows preservation of the uterus and the patient’s reproductive capability and helps to prevent surgery related complications. Complete resorption of the retroperitoneal hematoma and placenta accreta was found to have occurred two months after TAE. The patient’s menstrual cycle resumed three months after TAE without any sequelae.

Key words: Placenta accreta, Retroperitoneal hematoma, Postpartum hemorrhage, Transcatheter arterial embolization

Introduction

Placenta accreta can be encountered when attempting to manually remove the placenta after a vaginal delivery. Researchers have reported that the incidence of placenta accreta as 1 in 533 pregnancies over the period of 1982-2002[1]. The most important risk factor for placenta accreta is placenta previa after a prior caesarean delivery. In women with placenta previa, the increased rate of placenta accreta is correlated with an increase in the caesarean rate[2]. Other risk factors for placenta accreta include previous uterine surgery, such as uterine curettage, myomectomy, hysteroscopic removal of intrauterine adhesions, cornual resection of an ectopic pregnancy and a caesarean scar pregnancy[3]. The potential sequelae of the massive hemorrhage associated with placenta accreta include disseminated intravascular coagulopathy, adult respiratory distress syndrome, renal failure, peripartum hysterectomy and maternal death[4]. When a diagnosis of placenta accreta with massive hemorrhage is suspected after a vaginal birth, management options include blood transfusion, intrauterine balloon tamponade, selective pelvic
embolization, and emergency hysterectomy.

Removing placenta accreta by uterine curettage may result in uterus perforation, internal bleeding, retroperitoneal hematoma and intraperitoneal adhesions (Asherman syndrome). The conventional approaches to the treatment of expanding retroperitoneal hematomas include evacuation, ligation of the bleeding vessels, and packing. Occasionally, these measures are not successful and any attempt to search for specific bleeding vessels may be impossible due to tissue distortion and the friability of the tissue. The aim of this report is to describe the advantages of using transcatheter arterial embolization [TAE] as a way of managing retroperitoneal hematoma and severe postpartum hemorrhage that has been caused by uterine curettage of placenta accreta after vaginal birth.

**Case report**

A 30-year-old woman, G4P2AA2, had a history that included two artificially induced abortions as well as uterine curettage to remove an adherent placenta after she gave birth to her first baby. On the present occasion she gave birth without any problems to a living male baby by vaginal delivery after a gestation of 40 weeks. The body weight of the child was 3,400 g. and the Apgar scores were 9 at one minute and 10 at five minutes. It was found that at 30 minutes after birth, the placenta was not able to be separated from the uterus after uterine massage and administration of an uterotonic agent (oxytocin), which was followed by controlled cord traction. On attempting to manually remove the adherent placenta, it became clear that the placenta was adhering to the uterus abnormally. After explaining the situation to the patient and her husband, she was sent to the operating room in order to undergo uterine curettage for placenta accreta. On attempting to remove the placenta accreta, we encountered severe uterine bleeding. Her blood pressure dropped to 70/50 mmHg. At this point uterotonic agents were given to the patient and a central venous pressure (CVP) catheter was set up to allow fluid supplements and blood components (6 units pack red blood cell, 6 units fresh frozen plasma and 6 units of platelet) to be transfused. The patient’s hemoglobin dropped from 12 g/dL to 7 g/dL. Due to persistent vaginal bleeding and unstable vital signs, the patient was transferred to the Department of Diagnostic Radiology for emergency angiographic embolization. The angiography revealed active bleeding from a branch of the bilateral internal iliac arteries (Fig. 1). Embolization of bilateral internal iliac arteries was then carried out using microcoils and gelfoam pieces and the bleeding diminished (Fig. 2). The patient withstood the procedure well. Next abdominal computed tomography (CT) was carried out and it revealed the presence of a retroperitoneum hematoma (10.2 x 7.3 cm) on the right side of pelvic cavity together with an abnormally adherent placenta (6.4 x 5.8 cm) within the uterine cavity (Fig. 3). The total blood loss suffered by the patient was estimated to be 3000 mL. She was transferred to the intensive care unit (ICU) for appropriate care. Two days later, heavy vaginal bleeding recurred (estimated blood loss 1000 mL). We consulted with the angiographers involved in the previous intervention and TAE was carried out a second time. The angiography revealed hyperemia and oozing from the bilateral internal iliac artery. The second time TAE was performed this also went smoothly without any procedure related complications. After the second TAE, bleeding was stabilized. The patient was discharged seven days after admission and has
since received regular follow up. The complete resorption of both the retroperitoneal hematoma and placenta accreta was found to have occurred two months after the second TAE. Her menstrual cycle resumed three months after second TAE without sequela.

Figure 1. Angiography revealed active bleeding from a branch of the bilateral internal iliac artery (arrow).

Figure 2. Angiography revealed that the bleeding stopped after embolization of the bilateral internal iliac artery (arrow).

Figure 3. A whole abdomen CT scan without enhancement revealed the presence of a right side retroperitoneal hematoma (10.2 x 7.3 cm) within the pelvic cavity together with an abnormally adherent placenta (6.4 x 5.8 cm) with some calcifications within the uterine cavity.
Discussion

Placenta accreta is defined as an abnormal adherence of the placenta to the uterine wall and is usually discovered when attempting the manual removal of a placenta. Removing a placenta accrete by uterine curettage may result in uterus perforation, internal bleeding, retroperitoneal hematoma and intrauterine adhesions (Asherman syndrome); this is because the myometrium may be very thin at the point of adherence.

Retroperitoneal hematomas may be the result of uterine perforation after uterine curettage or can be caused by expansion of a paravaginal hematoma. The conventional management procedures used to treat an expanding retroperitoneal hematoma consist of laparotomy for hematoma evacuation, ligation of bleeding vessels, and packing. However, these measures can be unsuccessful and any attempt to identify specific bleeding vessels may be impossible due to tissue distortion and the friability of the tissue.

In such circumstances, angiographic embolization procedures potentially offer advantages over surgical approaches when attempting hemostasis\textsuperscript{[5-10]}. These advantages include:

1. Specific bleeding sites are often impossible to identify during surgery, but can usually be easily identified by angiography.
2. The tamponade effect of the retroperitoneal hematoma is preserved.
3. Friable and distorted tissue can result in a predisposition towards surgical complications such as ureter injury, bladder injury and fistula formation. These can be avoided or minimized if the hemorrhage is able to be controlled through embolization.
4. If embolization is successful, hysterectomy can be avoided and the child-bearing capability of the patient is preserved.
5. Gelatin sponges such as Gelfoam usually recanalizes in two to three weeks.
6. The procedure is less invasive and re-embolization is possible.

The indications for TAE are as follows: (a) the hope to preserve the uterus and reproductive functioning of the patient; (b) poor coagulation making the patient unsuitable for an operation; (c) the hope to minimize surgical complications; and (d) the fact that bleeding sites are difficult to identify during surgery. The primary complications associated with the use of vascular embolization techniques have been related to inadequate collateral flow that may result in ischemic compromise of the viscera and misplaced emboli that are introduced into the peripheral circulation resulting in gangrenous injury of an extremity, arterial thrombosis, vaginal necrosis, local hematoma, fever and abdominal pain\textsuperscript{[11]}. The first TAE was performed while the patient was in shock and her blood vessels thus were contracted. The amount of embolization material that was needed to fill the bleeding vessels thus was limited. When hemostasis was achieved and the patient’s blood pressure had increased, her blood vessels would then dilate. Under such circumstances, it seems likely that the embolization material might become insufficient to completely embolize the bleeding vessels and this might be the reason for the reoccurrence of bleeding. This does seem to have happened and we needed a second TAE to refill the vessels with embolization material in order to achieve hemostasis. After the first arterial embolization was completed, we left the arterial catheter in the inguinal area for re-embolization if that became necessary. In order to
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To prevent the need for a second TAE, the hemodynamic condition of patient should be kept as stable if possible.

In summary, angiographic embolization procedures potentially offer advantages over surgical approaches when managing retroperitoneal hematoma and severe postpartum hemorrhage caused by placenta accrete. This is particularly the case when the patient is hemodynamically stable and volume and blood product replacement is able to compensate for any blood loss; furthermore, facilities that have the appropriate radiology services to allow this intervention and the availability of well-trained angiographers on a 24-hour basis are also needed. Leaving a placenta accreta in situ and awaiting spontaneous placental resorption would seem to be an alternative option when the patient is a well motivated and compliant woman who wishes to preserve her fertility and who understands the significant risks of infection, hemorrhage, the need for TAE and the possibility of emergency hysterectomy[12-13]. Among women who have retained their uterus, placental resorption has been observed on follow-up to occur at a median of 13.5 weeks (range 4 to 60 weeks)[14]. Methotrexate has been used for the conservative management of placenta accreta in order to try and decrease trophoblast activity and speed up involution. Under recent guidelines, the RCOG does not recommend that this approach is used routinely[15]. Another review article has reported that methotrexate is unlikely to be helpful as the trophoblast cells are no longer dividing[16-17]. Therefore, we do not advocate the routine use of methotrexate during the conservative management of placenta accreta.

References

經由導管動脈栓塞成功的處理黏著性胎盤合併後腹膜腔血腫及嚴重產後子宮出血病例報告

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陰道自然產後想要清除子宮內胎盤組織時，有時會發現胎盤組織異常黏著子宮。以子宮搔刮來清除子宮內黏著性胎盤有時可能會造成子宮穿孔、內出血、後腹膜腔血腫或子宮內沾黏後遺症。在本文中我們將討論如何經由導管動脈栓塞成功的處理可能因搔刮子宮內黏著性胎盤造成的後腹膜腔血腫及嚴重子宮出血。經由導管動脈栓塞能容易找到出血點，保留子宮生育能力及避免手術可能造成併發症。經由導管動脈栓塞後兩個月，後腹膜腔血腫及子宮黏著性胎盤完全吸收。三個月後經週期恢復正常。

關鍵字：黏著性胎盤，後腹膜腔血腫，產後出血，經由導管動脈栓塞