

Removal of an Adherent Placenta from the Uterine Fundus Using Temporary Uterine Inversion with Uterine Preservation Following Cesarean Delivery: A Case Report

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ABSTRACT

Introduction: Abnormal placental adherence to the uterine wall can be associated with failure of placental separation, hemorrhage, and the need for complex surgical interventions during delivery. In severe cases, preservation of the uterus may be challenging. In such circumstances, selecting an appropriate surgical approach to control hemorrhage and remove the adherent tissue while preserving the uterus is of particular importance. In this report, a surgical technique based on temporary uterine inversion was used to provide direct access to the site of placental adherence at the uterine fundus and facilitate uterine preservation at Sarem Super Specialty Hospital, Tehran.

Case Presentation: A 54-year-old woman with a history of one previous cesarean delivery conceived through in vitro fertilization (IVF) using a donated embryo and had a singleton pregnancy. The pregnancy was complicated by edema, hypertension, and cervical insufficiency, for which the patient received medical treatment and underwent cervical cerclage. At 36 weeks of gestation, she underwent cesarean delivery because of pain, and a neonate in good general condition was delivered. Following delivery, due to incomplete placental separation and adherence of part of the placenta to the uterine fundus, temporary uterine inversion was performed to provide access to the site of placental adherence, with the aim of preserving the uterus. After removal of the adherent tissue, control of hemorrhage, and repair of the affected area, the uterus was restored to its normal position and was successfully preserved without the need for hysterectomy or blood transfusion.

Conclusion: This case demonstrates that, in selected cases of placental adherence to the uterine fundus in which direct access to the site of adherence is difficult and uterine preservation is desired, temporary uterine inversion may provide improved visualization and access to the adherent area, facilitate removal of adherent tissue, control hemorrhage, and repair of the endometrial surface. In the present case, this approach allowed successful uterine preservation without the need for hysterectomy or blood transfusion. Given that this report describes a single case, further studies are warranted to evaluate the efficacy and safety of this technique.

Keywords: Placental Adherence; Uterine Fundus; Adherent Placenta; Uterine Inversion; Uterine Preservation; Cesarean Delivery; Case report.

Article History

Introduction

Abnormal placental adherence to the uterine wall represents a major clinical challenge in the management of the third stage of labor and may be associated with failure of placental separation, significant postpartum hemorrhage, and the need for complex surgical interventions ^[1,2]. This condition becomes particularly challenging when the site of placental adherence is located in an area of the uterus that is difficult to access surgically ^[3]. In such circumstances, attempts to separate the placenta without adequate visualization and access may increase blood loss and further trauma to the uterine tissue. Therefore, accurate identification of the site of placental adherence and selection of an appropriate surgical approach based on the individual clinical circumstances are essential for minimizing complications and achieving effective hemostasis ^[4,5]. When placental adherence is localized to the uterine fundus, surgical management may be particularly challenging. Compared with the lower uterine segments, the fundus presents different anatomical and surgical access considerations, and the presence of placental adherence with incomplete placental separation may limit direct visualization and access to the inner uterine surface. In such situations, conventional methods of placental separation may be insufficient, requiring the surgeon to adopt an approach that provides adequate access to the affected area while allowing effective hemorrhage control and repair of the uterine tissue ^[6].

Hysterectomy may be considered a life-saving intervention for controlling hemorrhage in severe cases of abnormal placental adherence; however, loss of the uterus has significant consequences for the patient. Therefore, in hemodynamically stable patients with appropriate clinical conditions for conservative management and in whom uterine preservation is desired, organ-preserving surgical approaches may be considered. Achieving this goal requires controlled management of the adherent tissue, effective control of hemorrhage, and repair of any resulting injury to the inner uterine surface ^[7,8].

One of the major challenges in the conservative management of such cases is obtaining adequate access to the site of placental adherence. When the site of adherence cannot be adequately visualized through the conventional surgical approach, establishing an appropriate surgical field may be critical ^[9,10]. In the present case, temporary uterine inversion was employed to overcome this limitation. According to the surgical report, after exteriorization of the uterus from the abdominal cavity and in coordination with the anesthesia team to achieve adequate uterine relaxation, the uterine fundus was inverted to provide direct visualization and access to the site of placental adherence. The adherent areas were then cleared using

a large ball curette, and the residual adherent tissue was removed. Bleeding sites were controlled using bipolar electrocautery to achieve hemostasis, while areas with loss of the endometrium were repaired with sutures.

The significance of this approach extends beyond providing surgical access; in the present case, the primary objective was to facilitate uterine preservation in a setting where incomplete placental separation and adherence to the uterine fundus raised the possibility of hysterectomy. Following completion of the surgical intervention, the uterus was restored to its normal anatomical position, and uterotonic agents were administered to achieve adequate uterine tone. The procedure was completed without the need for hysterectomy or blood transfusion. Given the importance of uterine preservation in selected patients and the challenges associated with accessing localized areas of placental adherence, techniques that enable direct visualization of the lesion, effective hemorrhage control, and uterine repair are of considerable clinical relevance. Accordingly, this report presents a successful case of managing placental adherence to the uterine fundus using temporary uterine inversion, an approach that provided direct access to the site of adherence, facilitated removal of the affected tissue and control of hemorrhage, and ultimately allowed preservation of the uterus without the need for hysterectomy or blood transfusion.

Case Presentation

A 54-year-old woman with a history of one previous cesarean delivery was managed at Sarem Super Specialty Hospital, Tehran. The patient conceived through in vitro fertilization (IVF) following the transfer of two donor embryos, with continued development of one embryo resulting in a singleton pregnancy. During pregnancy, she developed edema and hypertension and received methyldopa under cardiology supervision. Cervical insufficiency was also diagnosed, and cervical cerclage was performed. At 33 weeks of gestation, the patient was admitted because of vaginal spotting and received magnesium sulfate and corticosteroid therapy. Following ultrasonographic evaluation and confirmation of a stable condition, she was discharged. At 36 weeks of gestation, she was readmitted because of pain and underwent cesarean delivery. A neonate weighing 2330 g, measuring 47 cm in length, with a heart rate of 148 beats/min and Apgar scores of 8 and 9 was delivered in good general condition.

Following delivery, incomplete placental separation was noted, with part of the placenta adherent to the uterine fundus. The non-adherent portions of the placenta were initially removed; however, the portion adherent to the fundus could not be separated. Given the patient's desire for uterine preservation and the difficulty in obtaining direct access to the site of placental adherence, the surgical team at Sarem

Women's Hospital employed a temporary uterine inversion technique.

In this technique, after exteriorization of the uterus from the abdominal cavity and coordination with the anesthesia team to achieve adequate uterine relaxation, the uterine fundus was inverted. This maneuver provided direct visualization and adequate access to the site of placental adherence. The adherent areas of the fundus were then curetted and cleared using a large ball curette. Bleeding sites were controlled with bipolar electrocautery to achieve hemostasis, and areas with loss of the endometrium were repaired with sutures. Following completion of these procedures, the uterus was restored to its normal anatomical position, and uterotonic agents were administered to achieve adequate uterine tone.

Ultimately, this surgical approach was successfully performed at Sarem Super Specialty Hospital, allowing effective management of the placental adherence and preservation of the uterus without the need for hysterectomy or blood transfusion. This case demonstrates the successful application of temporary uterine inversion to provide direct access to placental adherence at the uterine fundus while simultaneously facilitating local management of the lesion, achieving hemostasis, and preserving the uterus.

Discussion

The aim of this case report was to present a successful surgical approach for the management of placental adherence to the uterine fundus in a situation in which placental separation was difficult and direct access to the site of adherence was limited. The significance of this case lies in the use of temporary uterine inversion to provide adequate visualization and access to the adherent area while attempting to preserve the uterus. In cases of placental adherence, prompt decision-making and selection of an appropriate approach for hemorrhage control and management of the adherent tissue are crucial, as attempts to separate the placenta without adequate access may further complicate the surgical procedure. Although hysterectomy may be necessary for hemorrhage control in certain circumstances, it results in loss of the uterus; therefore, conservative approaches are particularly important in patients whose clinical condition permits uterine preservation and in whom preservation of the uterus is desired^[11,12]. In this context, reporting techniques that provide adequate access to the site of placental adherence while allowing local control of the lesion and uterine preservation may be of considerable clinical value. In the present case, the technique was performed to provide direct access to the fundal adhesion site, remove the adherent tissue, control hemorrhage, and repair the affected uterine surface, ultimately allowing preservation of the uterus.

Dathan-Stumpf et al. reported in 2021 a case of a 33-year-old woman who developed uterine inversion associated with adherent placenta following vaginal

delivery^[13]. An initial attempt at uterine repositioning was performed under general anesthesia. After separation of the placenta, laparotomy was required because the uterine fundus remained inverted, and the uterus was ultimately restored to its normal position by manual pressure applied vaginally. The patient developed severe postpartum hemorrhage, with an estimated blood loss of approximately 3000 mL, and required oxytocin, prostaglandins, fluid resuscitation, and blood transfusion. In comparison, temporary uterine inversion was also used in the present case to facilitate access to and management of placental adherence. However, unlike the report by Dathan-Stumpf et al.^[13], inversion in the present case was performed as a controlled and temporary surgical technique to expose the fundal adhesion site rather than as an obstetric complication. Furthermore, after removal of the adherent tissue, hemorrhage control, and endometrial repair, the uterus was preserved without the need for hysterectomy or blood transfusion. This difference may be attributable to differences in the circumstances and purpose of uterine inversion, the location and characteristics of placental adherence, the controlled nature of the surgical technique, and direct management of the adhesion site.

In 2021, Kashani et al. reported a case of complete uterine inversion following vaginal delivery in a 28-year-old woman with complete placental adherence to the uterine fundus^[14]. In this patient, the uterus and placenta were simultaneously expelled through the vagina during a Valsalva maneuver. Following the diagnosis of placenta accreta, the placenta was gently detached and the uterus was manually repositioned. However, because of uterine bleeding and the patient's request for sterilization, a subtotal abdominal hysterectomy was subsequently performed, and the patient received two units of packed red blood cells. Compared with the present case, both reports highlight the association between fundal placental adherence, uterine inversion, and the challenges of placental management. However, in the report by Kashani et al.^[14], uterine inversion occurred as an unintended obstetric complication following delivery and ultimately resulted in hysterectomy, whereas in the present case, temporary uterine inversion was deliberately employed as a surgical technique to provide access to the fundal adhesion site. Following removal of the adherent tissue, hemorrhage control, and endometrial repair, the uterus was preserved without hysterectomy or blood transfusion. This difference may be related to the distinct purpose and manner of uterine inversion, differences in the clinical circumstances of the two patients, and, particularly, the controlled use of uterine inversion in the present case.

Nii et al. reported in 2023 a surgical technique for fertility preservation in patients with placenta accreta spectrum (PAS) without placenta previa^[15]. In their

report, a 38-year-old woman who conceived through IVF was found during cesarean delivery to have a placenta that could not be separated from the uterine fundus, with significant hemorrhage subsequently developing. The authors performed the TURIP procedure, which involved placement of a tourniquet around the uterine isthmus for hemorrhage control, uterine inversion to expose the site of placental adherence, and placental separation by sharp dissection under direct visualization. The separated areas were subsequently sutured to achieve hemostasis. The patient recovered uneventfully and subsequently achieved a second pregnancy through IVF one year later ^[15]. The findings of this study are highly consistent with those of the present case, as both patients had fundal placental adherence identified at cesarean delivery, and controlled uterine inversion was used to provide direct access to the adhesion site, allowing controlled placental separation and uterine preservation. However, an important difference is that the TURIP technique incorporated uterine isthmus tourniquet application and sharp dissection under direct visualization as key components of the procedure ^[15], whereas in the present case, following uterine inversion, the adherent area was managed using curettage, bipolar electrocautery, and repair of areas with endometrial loss. Thus, both reports support the same underlying principle—controlled uterine inversion to improve surgical access and facilitate fertility-preserving management—although the techniques used for tissue removal and hemostatic control differed. In the present case, the absence of a need for hysterectomy or blood transfusion further supports the successful outcome of the uterine-preserving approach.

Marlina et al. reported in 2024 a case of a 29-year-old woman who developed retained placenta and uterine inversion following vaginal delivery. In this patient, umbilical cord traction was met with resistance, and after several attempts, the placenta was expelled together with the uterine fundus, resulting in severe postpartum hemorrhage and a reduction in hemoglobin to 7.8 g/dL ^[16]. Rapid uterine repositioning successfully controlled the hemorrhage, and the patient was discharged after four days without further complications. Compared with the present case, the main similarity lies in the involvement of the uterine fundus in association with placental retention/adherence, highlighting the importance of appropriate management during the third stage of labor. However, in the report by Marlina et al. ^[16], uterine inversion occurred as an unintended complication following umbilical cord traction and placental delivery, and management primarily focused on rapid uterine repositioning to control hemorrhage. In contrast, in the present case, uterine inversion was performed in a controlled and deliberate manner as a surgical technique to provide direct access to the site of placental adherence. Therefore, unlike the study by

Marlina et al., in which uterine inversion itself constituted the major obstetric complication, inversion in the present case was used as a therapeutic surgical tool for uterine preservation and management of fundal placental adherence. Both reports emphasize the importance of prompt recognition and management of this condition and the role of adequate access to the uterine fundus in preventing complications; however, in the present case, this approach resulted in successful uterine preservation without the need for hysterectomy or blood transfusion.

Conclusion

Placental adherence to the uterine fundus may be associated with incomplete placental separation, hemorrhage, and difficult access to the site of adherence during delivery, potentially necessitating invasive interventions such as hysterectomy. The present case demonstrates that temporary and controlled uterine inversion may be considered in selected cases as a surgical approach to provide direct access to the site of placental adherence, facilitate removal of adherent tissue, control hemorrhage, and repair the affected inner uterine surface. In this patient, the use of this technique at Sarem Super Specialty Hospital, Tehran, enabled successful management of placental adherence and preservation of the uterus without the need for hysterectomy or blood transfusion. This finding is consistent with previous reports describing the use of uterine inversion to facilitate access to the site of placental adherence and preserve the uterus, although the methods used for tissue removal and hemorrhage control differed in the present case. Given the single-case nature of this report, the efficacy or superiority of this technique cannot be definitively generalized. Nevertheless, in appropriately selected patients and well-equipped centers, this approach may represent a valuable conservative, uterus-preserving surgical option for the management of fundal placental adherence.

Ethical Issue

In conducting this research, all ethical principles in medical and biological research were observed in accordance with the Declaration of Helsinki, and the rights, dignity, and confidentiality of the participants were protected.

Conflict of Interests

There was no conflict of interest in this study.

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