Case Report
Obstet Gynecol Sci 2013;56(3):194-197
http://dx.doi.org/10.5468/ogs.2013.56.3.194
pISSN 2287-8572 · eISSN 2287-8580

Obstetrics & Gynecology Science

Conservative multidisciplinary management of placenta percreta following *in vitro* fertilization

Jae-Yoon Shim[1], Seong Yun Hong[2], Hye-Sung Won[1], Pil Ryang Lee[1], Ahm Kim[1]

Department of Obstetrics and Gynecology, [1]University of Ulsan College of Medicine, Asan Medical Center, Seoul; [2]Catholic University of Daegu School of Medicine, Daegu, Korea

Placenta percreta is an extremely rare and the most severe form of placental invasion, that is associated with severe maternal morbidity and mortality. We report a case of nulliparous woman who underwent 10 cycles of *in vitro* fertilization (IVF) without any known risk factors. We conserved her uterus by spontaneous vaginal delivery, leaving the placenta in situ, pelvic arterial embolization, and primary resection of the remaining placental tissues. This case demonstrates that repetitive IVF is a possible risk factor for placental invasion, and that conservation of the uterus can be achieved in such cases using a multidisciplinary approach.

Keywords: Assisted reproductive technics; Magnetic resonance imaging; Placenta percreta; Uterine artery embolization; Uterine rupture

Introduction

Complete invasion of the placenta through the myometrium and the uterine serosa is termed placenta percreta. This is the rarest and most severe form of placental invasion, and accounts for 5% to 7% of all placenta accreta cases [1]. Research suggests that the pathophysiology of placenta percreta involves a deficiency of the deciduas [2]. Abnormal placentation, including placenta percreta, usually occurs in the lower uterine segment due to a deficiency of decidua at the level of a Cesarean section scar [3]. Other reported risk factors for placenta percreta include placenta previa, maternal age >40 years, multiparity, repetitive abortions, and uterine malformations [4]. Clinically, placenta percreta is associated with a risk of massive postpartum hemorrhage, Cesarean hysterectomy, and severe maternal morbidity and mortality. Prenatal diagnosis of placenta percreta is therefore necessary and may be life-saving.

The present report describes a case of placenta percreta, which was diagnosed prenatally by magnetic resonance imaging (MRI), in a patient who had undergone *in vitro* fertilization (IVF). Conservation of the uterus was achieved using a multidisciplinary approach.

Case report

A 35-year-old nulliparous woman was referred at 24 weeks' gestation to our clinic with regular uterine contractions. She had a history of primary infertility due to bilateral occlusion of the fallopian tubes, and had undergone 10 cycles of IVF. She had no relevant family or medical history. Pelvic examination on admission revealed that the membranes were intact and that the uterine cervix was 90% effaced and 3 cm dilated. Vital signs were stable and microbiological examination revealed no abnormalities of the urine sample or vaginal swab.

Received: 2012.11.19. Revised: 2012.12.17. Accepted: 2012.12.26.
Corresponding author: Jae-Yoon Shim
Department of Obstetrics and Gynecology, University of Ulsan College of Medicine, Asan Medical Center, 88 Olympic-ro 43-gil, Songpa-gu, Seoul 138-736, Korea
Tel: +82-2-3010-3747 Fax: +82-2-3010-6944
E-mail: jyshim@amc.seoul.kr

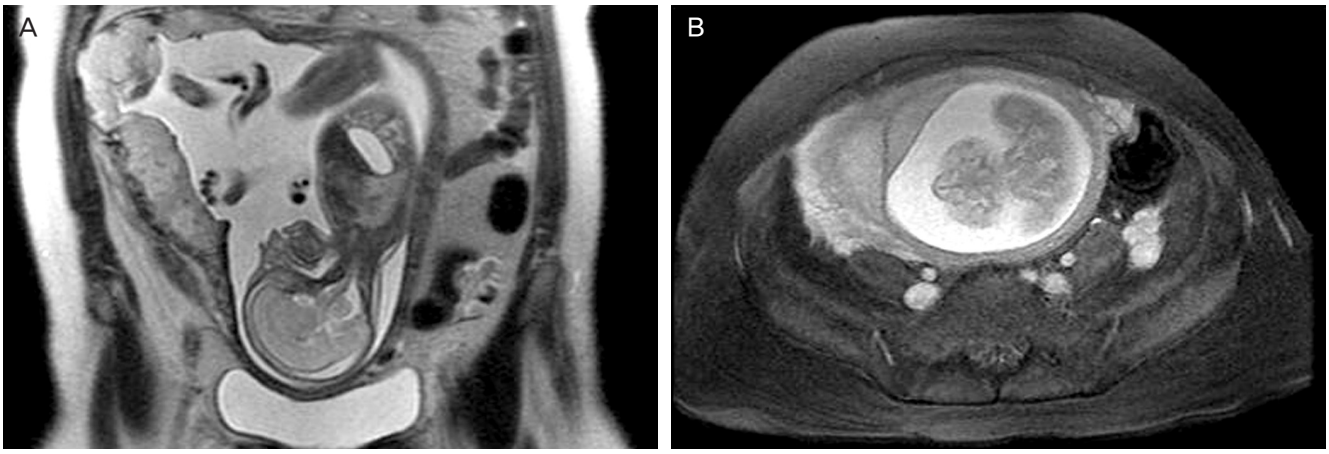

Fig. 1. (A) Coronal magnetic resonance imaging view of the pelvis. The placenta is located in the right fundal portion of the gravid uterus, penetrates the myometrium, and extends into the peritoneal cavity. (B) Fat-saturated axial image. High intensity signals are evident along right fundal portion of the uterus, indicating a peri-uterine hematoma.

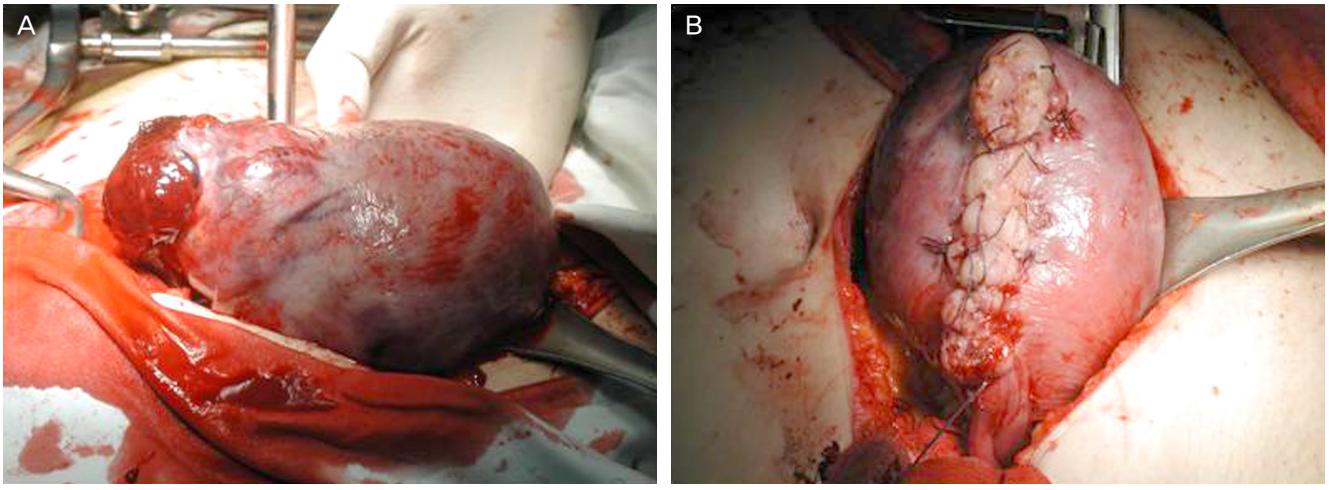

Fig. 2. Photographs showing the ruptured uterus and protruding placental tissue (A), and the repaired uterus, after removal of the placenta (B).

Sonographic examination showed a vertex presentation, fetal biometry compatible with 24 weeks' gestation, an estimated fetal weight of 603 g, and location of the placenta in the right fundus with thinning of the myometrium. MRI of the pelvis was performed to confirm placental invasion. Axial and coronal T2-weighted MRI showed that placental tissue occupied the superolateral aspect of the fundus, and that the full thickness of both the myometrium and the uterine serosa was involved. There were no signs of placental invasion of adjacent organs (Fig. 1).

On admission, tocolytics were commenced to suppress the regular uterine contractions. Betamethasone was also administered to facilitate fetal pulmonary maturation. Despite these measures, the uterine contractions intensified and progressive changes in the uterine cervix were observed; thus, tocolytic therapy was discontinued 6 hours post-admission. The parents were fully informed of the potential complications associated with preterm birth and placenta percreta, and they decided that vaginal delivery should be attempted. Intrapartum fetal heart rate monitoring showed a reassuring pattern. A female newborn weighing 669 g was delivered 30 minutes after stopping tocolytics by spontaneous vaginal delivery, with Apgar scores of 2 and 4 at 1 and 5 minutes, respectively. The newborn was transferred immediately to the neonatal intensive care unit.

Spontaneous delivery of placental tissue did not occur, and

a decision was made to leave the placenta in situ. No significant hemorrhage occurred in the 1 hour period post-delivery. Pelvic arterial embolization was performed at the 1 hour post-delivery to prevent hemorrhage at the time of placental separation. Under fluoroscopic guidance, the bilateral uterine arteries were selectively catheterized and embolized with absorbable gelatin sponge pledgets.

Six hours after delivery, maternal tachycardia and vaginal bleeding occurred, and placental detachment or uterine rupture was suspected. Therefore, a decision was made to remove the placenta in the operating room under general anesthesia. Most of the intrauterine placenta was removed vaginally using placental forceps under transabdominal sonography guidance. Emergency laparoscopy was performed, which revealed a ruptured placenta percreta with hemoperitoneum. Exploratory laparotomy was done immediately and primary resection of the remaining placental tissues and closure of the uterine wall was then performed (Fig. 2). The postoperative course was uneventful and the woman was discharged home 5 days postoperatively.

Discussion

The first-line imaging modalities for a diagnosis of placenta accreta are gray-scale ultrasound and color Doppler imaging [5]. MRI is used as an adjunct tool when sonography is inconclusive or the placenta cannot be visualized adequately, as in cases of posterior placenta. Recently, Derman et al. [3] identified sensitive MRI criteria for the diagnosis of placenta accrete. The authors recommended that MRI should not be used in isolation, and that careful correlation with placental sonography and clinical history must be performed in each case.

Hysterectomy is the traditional treatment for placenta percreta, since previous reports suggest that it is associated with a lower rate of mortality than conservative management [6,7]. For two main reasons, many obstetricians tend to perform a Cesarean section in cases of placenta percreta. Firstly, these cases are considered to be at increased risk of hysterectomy. Secondly, the most common clinical scenario in placenta percreta cases is placenta previa after previous Cesarean delivery. In the present case, vaginal delivery was possible as the placenta was located in the uterine fundus, and the maternal vital signs and fetal heart rate were normal. Several reports indicate that uterus-conserving treatment may be used successfully in the management of invasive placentation [8,9]. The findings of a recent systemic review suggest that various uterus-preserving treatment modalities may be effective in such cases [10]. However, no conclusions about the comparative advantage between any modalities can be generalized.

In most cases, the etiology of placenta percreta is multifactorial, and few cases can be attributed to a single risk factor [1]. In the present case, placenta percreta developed in the absence of any of the above-mentioned risk factors or any previous history of gestational abnormalities. However, the woman had undergone repetitive IVF cycles, which may have changed the risk of placenta percreta. A recent retrospective study identified a significant 13-fold increase in the risk of placenta accreta in IVF pregnancies compared with spontaneous pregnancies [2]. We suggest two possible mechanisms for placental invasion following IVF. Firstly, IVF stimulation protocols may induce morphological and structural changes, and disturb the expression of relevant genes in the endometrium; changes which could contribute to abnormal implantation [11]. Secondly, repetitive entering of the endometrial cavity through the cervix by mechanical means during embryo transfer may damage the endometrium.

The main lessons to be learned from the present case are that repetitive IVF is a possible risk factor for placental invasion, and that conservation of the uterus can be achieved in such cases using a multidisciplinary approach.

References

1. Esmans A, Gerris J, Corthout E, Verdonk P, Declercq S. Placenta percreta causing rupture of an unscarred uterus at the end of the first trimester of pregnancy: case report. Hum Reprod 2004;19:2401-3.
2. Esh-Broder E, Ariel I, Abas-Bashir N, Bdolah Y, Celnikier DH. Placenta accreta is associated with IVF pregnancies: a retrospective chart review. BJOG 2011;118:1084-9.
3. Derman AY, Nikac V, Haberman S, Zelenko N, Opsha O, Flyer M. MRI of placenta accreta: a new imaging perspective. AJR Am J Roentgenol 2011;197:1514-21.
4. Committee on Obstetric Practice. ACOG committee opinion. Placenta accreta. Number 266, January 2002. American College of Obstetricians and Gynecologists. Int J Gynaecol Obstet 2002;77:77-8.

5. Wong HS, Cheung YK, Zuccollo J, Tait J, Pringle KC. Evaluation of sonographic diagnostic criteria for placenta accreta. J Clin Ultrasound 2008;36:551-9.
6. Fox H. Placenta accreta 1945-1969: a review. Obstet Gynecol Surv 1972;27:475-90.
7. Timmermans S, van Hof AC, Duvekot JJ. Conservative management of abnormally invasive placentation. Obstet Gynecol Surv 2007;62:529-39.
8. Panoskaltsis TA, Ascarelli A, de Souza N, Sims CD, Edmonds KD. Placenta increta: evaluation of radiological investigations and therapeutic options of conservative management. BJOG 2000;107:802-6.
9. Soliman N, Babar SA. Spontaneous rupture of the uterus secondary to placenta percreta with conservation of the uterus. J Obstet Gynaecol 2010;30:517-8.
10. Steins Bisschop CN, Schaap TP, Vogelvang TE, Scholten PC. Invasive placentation and uterus preserving treatment modalities: a systematic review. Arch Gynecol Obstet 2011;284:491-502.
11. Horcajadas JA, Riesewijk A, Polman J, van Os R, Pellicer A, Mosselman S, et al. Effect of controlled ovarian hyperstimulation in IVF on endometrial gene expression profiles. Mol Hum Reprod 2005;11:195-205.