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Abruptio Placentae in Subsequent Pregnancy after Conservative Management of Hemorrhagic Cesarean Scar Pregnancy by Transcatheter Arterial Chemoembolization

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Abstract

Introduction: Cesarean scar pregnancy is a rare but dangerous type of ectopic pregnancy in which implantation occurs within the fibrous tissue of a cesarean scar defect. Conservative management of cesarean scar pregnancy is challenging, especially when future fertility preservation is a significant concern. Furthermore, reports on significant maternal morbidity in subsequent pregnancies after successful conservative management of cesarean scar pregnancy are limited.

Case report: A 31-year-old woman with previous history of 2 cesarean sections transferred due to massive uterine hemorrhage 7 weeks after dilatation and curettage performed under the diagnosis of missed abortion at 7 weeks of gestation. Cesarean scar pregnancy was diagnosed and was conservatively managed by emergent transcatheter arterial chemoembolization (TACE) followed by multiple doses of systemic methotrexate administration. Seven months after TACE, she spontaneously conceived. At 36 weeks and 5 days of pregnancy, emergency cesarean section was performed due to sudden massive hemorrhage. Abruptio placentae was diagnosed when hysterotomy was performed. After manual removal of the placenta, a healthy infant was delivered. The postoperative course was uneventful.

Conclusion: The pregnancy course should be carefully monitored for early detection of maternal morbidity associated with placental abnormalities to achieve successful outcome in subsequent gestations after conservative management of cesarean scar pregnancy.

Keywords: abruptio placentae, cesarean scar pregnancy, transcatheter arterial chemoembolization, methotrexate

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Introduction

The rise of cesarean section rates worldwide has been associated with a secondary increase of complications due to abnormal placentation in subsequent gestation.¹ Implantation within the fibrous tissue of a cesarean scar defect is considered to be the rarest form of ectopic pregnancy, and it constitutes a potentially life-threatening condition. Conservative management of cesarean scar pregnancy is challenging, especially when future fertility preservation is a significant concern. Furthermore, reports of significant maternal morbidity in subsequent pregnancies after successful conservative management of cesarean scar pregnancy are limited.²⁻⁷

In the case reported here, abruptio placentae occurred in a subsequent pregnancy after successful conservative treatment of a hemorrhagic cesarean scar pregnancy by transcatheter arterial chemoembolization (TACE) followed by systemic methotrexate (MTX) administration.⁸ Also presented is a review of the literature. An electric MEDLINE search was carried out using the keywords “abruptio placentae,” “cesarean scar pregnancy,” AND “subsequent pregnancy” AND “pregnancy,” limiting the search to publications in the English language between 1966 and 2012.

Case Report

A 31-year-old woman with a previous history of 2 cesarean sections received dilatation and curettage under the diagnosis of missed abortion at 7 weeks of gestation. Although retrospective evaluation of the ultrasonographic image indicated the presence of a gestational sac in the previous cesarean section scar (Fig. 1A, arrow), such a diagnosis was not made at that time. Seven weeks later, she was transferred to our hospital due to hypovolemic shock status with massive vaginal hemorrhage. Prominent vascular flow was noted around the retained gestational products (Fig. 1B). On iodine-enhanced computerized tomographic image, active extravasation of contrast agent (Fig. 1C, arrow) originating from the left uterine artery (Fig. 1C, arrowhead) was identified. On emergent pelvic angiography, the occurrence of major bleeding was confirmed from the left uterine artery. After intra-arterial infusion of dactinomycin (Cosmegen, Merck & Co, Inc, Whitehouse Station, NJ, USA), arterial embolization was performed with

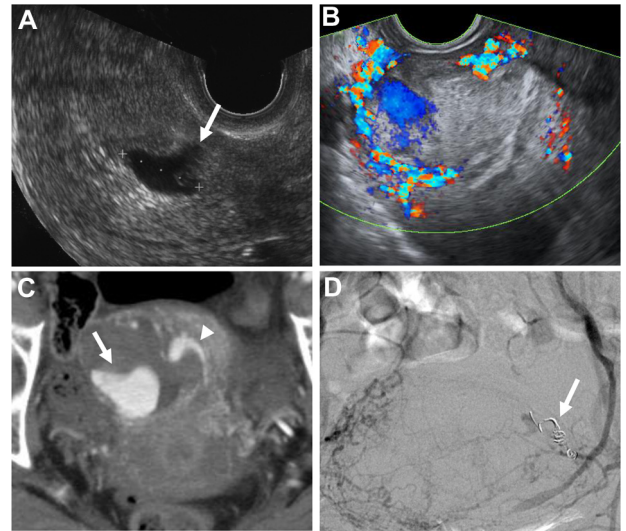


Figure 1. Findings in initial cesarean scar pregnancy. (A) Transvaginal ultrasonography showing the gestational sac at the previous cesarean section scar (arrow) at 7 weeks of gestation before dilatation and curettage performed under the diagnosis of missed abortion. (B) Transvaginal color Doppler ultrasonography showing the retained gestational products with prominent vascular flow at the previous cesarean section scar 7 weeks after dilatation and curettage, leading to the diagnosis of cesarean scar pregnancy. (C) Axial computerized tomographic image of hemorrhagic cesarean scar pregnancy showing the prominent extravasation (arrow) of iodine-contrast media from the left uterine artery (arrowhead). (D) Angiographic finding of cesarean scar pregnancy after intra-arterial infusion of dactinomycin followed by left arterial embolization by platinum coils (arrow).

Tornado platinum coils (Cook, Bloomington, IN, USA) for left uterine arterial occlusion (Fig. 1D, arrow) and with gelatin sponge particles (Gelpart, Nippon Kayaku, Tokyo, Japan) for right uterine arterial occlusion.⁸ With successful hemostasis, further conservative management was chosen and systemic intramuscular administration of MTX (50 mg/m²/day) was additionally performed 3 times. Subsequently, gestational products resolved without any further hemorrhagic complications, and first menstruation resumed 97 days after TACE.

The patient reported a missed period after 4 cycles of resumed menstruation and was diagnosed as having intrauterine pregnancy. At 8 weeks of gestation, normal fetal growth was identified (Fig. 2A). The lower segment of the placenta was attached to the cesarean section scar (Fig. 2A, arrow). Intermittent bleeding occurred from 16 weeks of gestation and was conservatively managed. To achieve more accurate diagnosis of the site of placental attachment, magnetic resonance imaging (MRI) was performed at 19 weeks of gestation. Attachment of the lower part of the placenta to the previous cesarean section scar

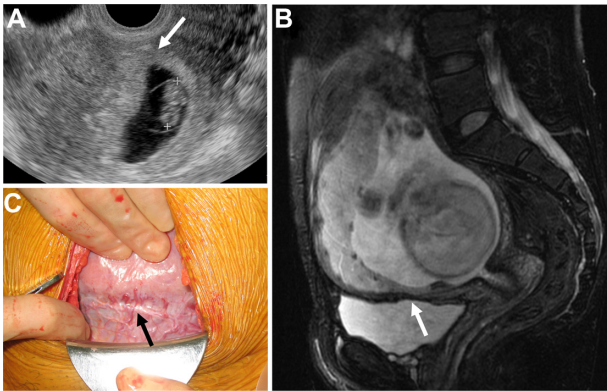


Figure 2. Findings in a subsequent pregnancy after successful conservative management of cesarean scar pregnancy. (A) Transvaginal ultrasonography showing normal fetal growth with cardiac activity and low-lying placenta attached to the anterior wall of the uterus at 8 weeks of gestation. Lower segment of placenta attached to the cesarean section scar (arrow). (B) Sagittal magnetic resonance imaging showing attachment of the lower part of the placenta to the previous cesarean section scar (arrow) at 19 weeks of gestation. (C) Uterine scar showing slight decompression (arrow) at emergency cesarean section performed at 36 weeks and 5 days of gestation.

was confirmed (Fig. 2B, arrow). After 21 weeks of gestation, uterine bleeding spontaneously ceased, and the pregnancy course was uneventful.

Elective cesarean section was scheduled at 37 weeks and 2 days of gestation. However, at 36 weeks and 5 days of pregnancy, the patient was transferred due to sudden massive bleeding. Since peritoneal fluid pooling was not evident on ultrasonography, uterine rupture was less likely. Regular fetal heartbeat was audible. Her hemoglobin value was 9.6 g/dL. Coagulation disorders were not identified. Emergency cesarean section was initiated under endotracheal general anesthesia. At laparotomy, the uterine scar from the previous cesarean section showed slight decompression, but scar dehiscence or rupture was not evident (Fig. 2C, arrow). When anterior transverse hysterotomy at 2 cm above previous cesarean section scar was performed, abruptio placentae was diagnosed with expulsion of substantial blood and clots. Since the placenta occupied the anterior wall of the uterus, manual removal of the placenta was initially performed, and then a healthy 2486 g girl was delivered. After confirming the absence of placental retention, the hysterotomy incision was closed with 2-layered sutures. Intraoperative blood loss was 1800 mL. The mother was admitted to the intensive care unit for cardiopulmonary management. Her hemoglobin value was 6.6 g/dL on postoperative day 1. Since her vital signs were well maintained, red

blood cell transfusion was not performed. The post-operative course was uneventful.

Discussion

With the recent developments of diagnostic and therapeutic modalities, various conservative measures including angiographic embolization, cytotoxic chemotherapy, surgical intervention, or a combination of these procedures have negated the need for hysterectomy in selected cases of cesarean scar pregnancy.¹ However, the optimal treatment regimen for this rare disorder has not yet been established. In the present case, as the correct diagnosis was not made by the time of a serious hemorrhage 7 weeks after dilatation and curettage, a complex task was required for conservative management. Although we previously showed that TACE is a feasible initial management option in cases of hemorrhagic cesarean scar pregnancy with deep placental invasion to achieve immediate hemostasis as well as early cytotoxic effects on ectopic villous tissue,⁸ the outcome in subsequent pregnancies in such high-risk cases has not been well described.

Previous reports have shown the controversial mixed outcomes in subsequent pregnancies after conservative treatment of cesarean scar pregnancy.²⁻⁷ Despite favorable results in the majority of conceived cases,^{2,4,7} serious major obstetric complications of abnormal placentation have been encountered, including recurrent cesarean scar pregnancy,³⁻⁷ placenta accreta,² and abruptio placentae.⁷

Conservative management of cesarean scar pregnancy could damage the myometrial structures around the cesarean section scar. This damage may potentially increase the risk, predisposing to a low implantation of the placenta in the uterus in the next pregnancy by interfering with physiological stretching of affected muscular structure and preventing or restricting the placenta moving away to the upper uterine segment.⁹ Furthermore, poor blood supply around the damaged uterine lower segment scar could result in abruptio placentae as in the present case. If an association between abruptio placentae and myometrial damage caused by prior cesarean scar pregnancy is biologically plausible, surgical resection of the old scar and new closure could be a feasible alternative to potentially prevent the development of abnormal placentation in a subsequent



gestation,¹⁰ especially when a new pregnancy is desired.

Earlier termination is definitely needed in cases of recurrent cesarean scar pregnancy.¹ However, there is a possibility of a healthy infant being delivered in cases of placenta accreta and abruptio placentae if proper management can be applied after making a correct and immediate diagnosis.^{2,7} The limited literature published on this issue to date could be due to the low incidence of another conception because patients have a fear of potential maternal morbidity despite retaining their fertility. Therefore, accumulating cases associated with significant obstetric morbidity would be helpful for treating physicians to understand further the pathophysiology of subsequent gestations after successful conservative management of cesarean scar pregnancy. Furthermore, physicians should explain the necessity of another elective cesarean section to avoid possible complications arising from poor placental development in subsequent gestations to pregnant women with previous conservative management of cesarean scar pregnancy.

In conclusion, pregnancy course should be carefully monitored for early detection of maternal morbidity associated with placental abnormalities to achieve successful outcome in subsequent gestations after conservative management of cesarean scar pregnancy.

Author Contributions

Conceived and designed the experiments: AT. Analysed the data: AT. Wrote the first draft of the manuscript: AT. Contributed to the writing of the manuscript: AT, SI, HN. Agree with manuscript results and conclusions: AT, SI, HN. Jointly developed the structure and arguments for the paper: AT, SI, HN. Made critical revisions and approved final version: AT. All authors reviewed and approved of the final manuscript.

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Competing Interests

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Disclosures and Ethics

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