

# Combined laparoscopic and hysteroscopic management of cesarean scar pregnancy with temporary occlusion of bilateral internal iliac arteries

## A case report and literature review

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### Abstract

**Rationale:** Cesarean scar pregnancy is a rare event that carries a risk of heavy hemorrhage and emergency hysterectomy. Many treatment modalities have been reported, but with no consensus. Here we report a case of combined laparoscopic and hysteroscopic treatment with temporary occlusion of the bilateral internal iliac arteries.

**Patient concerns:** A 28-year-old woman presented with amenorrhea diagnosed as an 11-week cesarean scar pregnancy after an unsuccessful abortion. The patient's serum human chorionic gonadotropin level was 40,542 mIU/mL. Magnetic resonance imaging revealed a mass measuring 5 × 4.5 cm over the anterior uterine isthmus.

**Diagnose:** Type III cesarean pregnancy.

**Interventions:** Diagnostic and operative laparoscopy were performed to remove the pregnancy tissue and repair the scar dehiscence after temporary occlusion of the bilateral internal iliac arteries, followed by hysteroscopy to confirm no pregnancy remnants and to free intrauterine adhesions.

**Outcomes:** Intraoperative and postoperative bleeding were minimal. The postoperative recovery was uneventful. Human chorionic gonadotropin normalized after 3 weeks.

**Lessons:** Temporary occlusion of the bilateral internal iliac arteries seems to be a good strategy to reduce hemorrhage in cesarean scar pregnancy. Hysteroscopy is necessary to deal with intrauterine lesions.

**Abbreviation:** UAE = uterine artery embolization.

**Keywords:** cesarean section, ectopic pregnancy, hysteroscopy, laparoscopy

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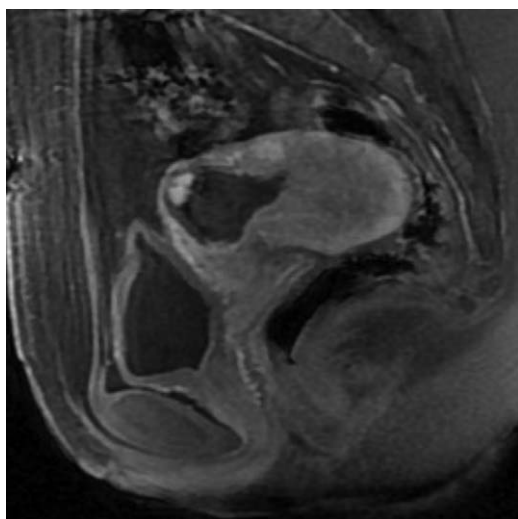
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## 1. Introduction

Cesarean scar pregnancy is a rare form of ectopic pregnancy that can have life-threatening consequences, including massive bleeding and uterine rupture. Although there is no consensus on treatment, currently available treatments reported in the literature include medical therapy, uterine artery embolization (UAE) in combination with dilatation and curettage, hysteroscopic resection, laparotomy resection, laparoscopic resection, and transvaginal resection. Medical therapy involves long recovery times, whereas UAE has complications such as postthrombotic syndrome, injury to ovarian function and the urinary system, and even pulmonary embolism,<sup>[1]</sup> sepsis,<sup>[2]</sup> and rectal perforation.<sup>[3]</sup> Neither medical therapy nor UAE in combination with dilatation and curettage can repair scar dehiscence, and these treatments do not reduce the risk of recurrence, particularly for patients who wish to preserve fertility. An ideal treatment should eliminate the embryo, repair the uterine defect, and preserve fertility without massive bleeding. Here we describe combined laparoscopy and hysteroscopy in a patient with cesarean scar pregnancy, with an emphasis on the temporary occlusion of the bilateral internal iliac arteries and transcervical resection of adhesions. Written permission to



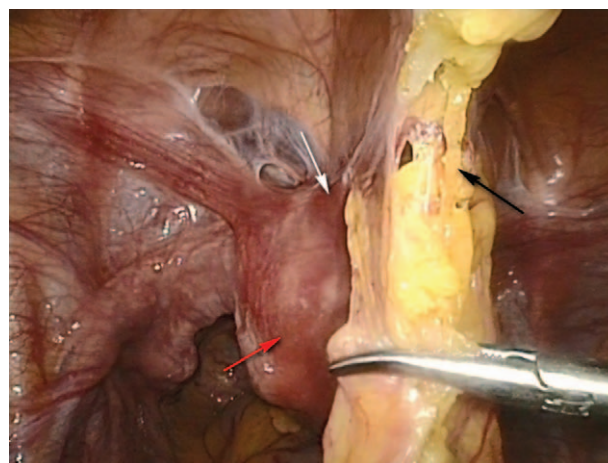
**Figure 1.** Magnetic resonance imaging shows a mass measuring 5 × 4.5 cm over the anterior uterine isthmus, where the myometrium is thin and discontinuous.

publish the case was obtained from the patient. The institutional review board of our hospital verified that this case report was exempt from the requirement for approval.

## 2. Case summary

A 28-year-old woman (gravida 9, para 1) came to our hospital at 11 weeks of amenorrhea after dilation and curettage at another center, which had been interrupted by unexpected hemorrhage. The patient was a housewife with a history of 1 cesarean delivery 7 years previously and 9 previous medical abortions (1 complete drug abortion and 8 by curettage). Family and psychosocial history were unremarkable. Physical examination was remarkable for mild lower abdominal tenderness on deep palpation, a small amount of bleeding from the external cervical os, and a mildly tender, enlarged, retroflexed uterus. Laboratory data revealed a low hemoglobin level of 6.7 g/dL and an elevated serum human chorionic gonadotropin level of 40,542 mIU/mL. Magnetic resonance imaging revealed a mass measuring 5 × 4.5 cm over the anterior uterine isthmus, where the myometrium was thin and discontinuous (Fig. 1). Type III cesarean scar pregnancy was initially diagnosed; however, gestational trophoblastic disease was not entirely excluded.

Diagnostic and operative laparoscopy was planned to remove the pregnancy tissue and repair the scar dehiscence after temporary occlusion of the bilateral internal iliac arteries, followed by hysteroscopy to confirm no pregnancy remnants or other intrauterine problems. Under general endotracheal anesthesia, the abdominal cavity was insufflated with carbon dioxide and intra-abdominal pressure was maintained at 15 mm Hg. A 10-mm trocar was inserted through a supraumbilical port in an attempt to visualize the implantation site within the previous uterine scar. However, the lower uterine segment, intestine, and greater omentum were densely adhered to the lower anterior abdominal wall (Fig. 2). Three more ancillary trocars were placed: one in the left mid quadrant (15-mm trocar); one in the left lower quadrant, 5 cm medial to the left anterior superior iliac crest (5-mm trocar); and one at McBurney point (5-mm trocar). Intestine and greater omentum were separated from the

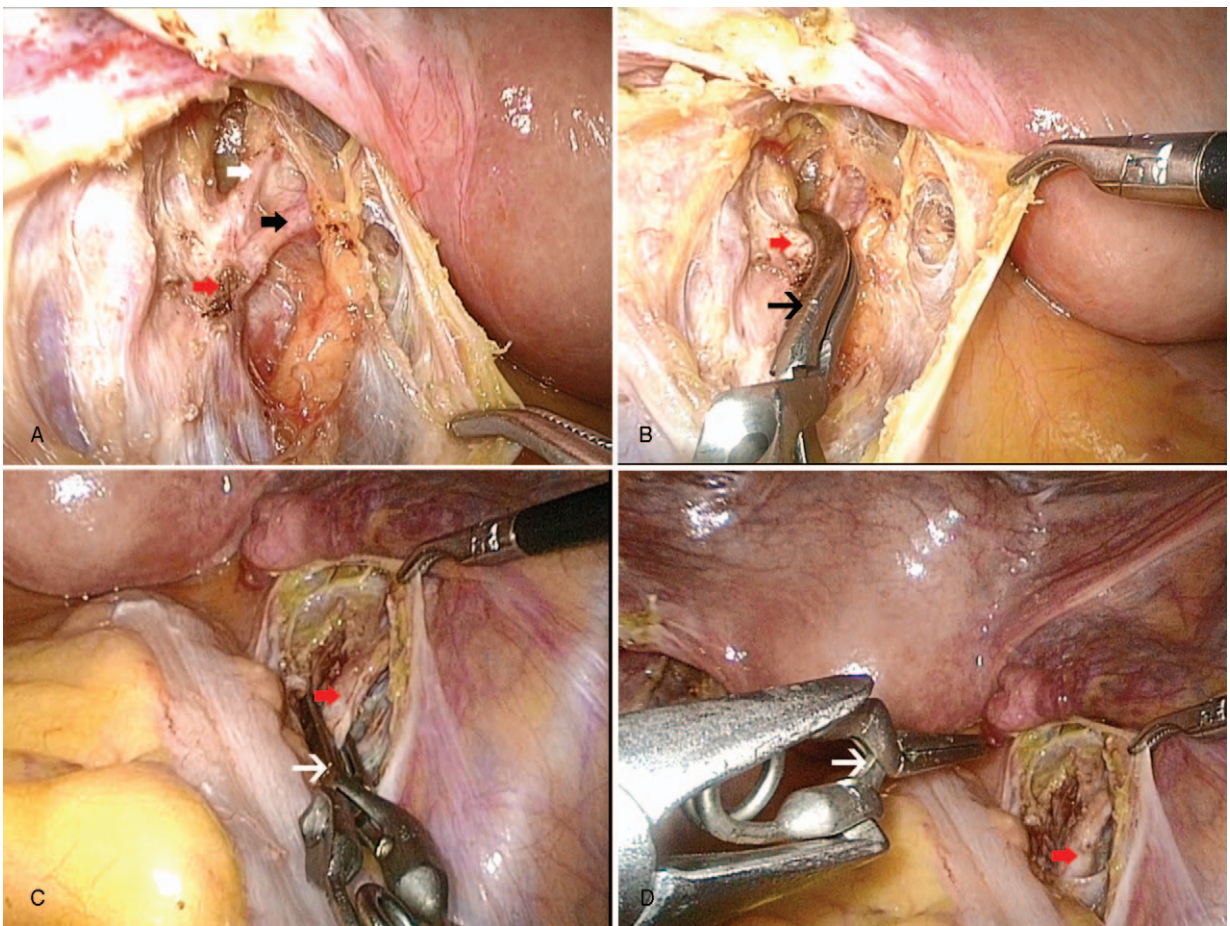


**Figure 2.** Dense adhesions are seen between the uterus (red arrow), especially the lower uterine segment (white arrow) and the lower anterior abdominal wall, bladder, and greater omentum (black arrow).

anterior abdominal wall. Adhesiolysis of uterus from the abdominal wall was delayed until removable metal clips (bulldog clips; Aesculap, Tuttlingen, Germany) were ready to occlude the bilateral internal iliac arteries, following dissection of the pelvic side walls. Fortunately, there was limited hemorrhage during dissection of the uterus from the abdominal wall and mobilization of the bladder. After the lower uterine myometrial implantation site was confirmed, the bilateral internal iliac arteries were occluded (Fig. 3). The gestation was dissected from the anterior uterine isthmus with electrocautery; the dark reddish tissue was swiftly removed with laparoscopic spoon forceps (Fig. 4). The cesarean scar dehiscence was repaired with one layer of continuous endoscopic sutures with 2-0 spiral PDO (Ethicon, Su Juan, Puerto Rico) (Fig. 5). Then the metal clips were removed; arterial occlusion time was 27 minutes. As planned, hysteroscopy was performed to confirm no remnants. However, we unexpectedly found intrauterine adhesions, which resulted in a narrow intrauterine cavity. Only the left ostium of the fallopian tube was seen because the right ostium was covered by dense adhesions in the upper cavity. After scissoring and eliminating the adhesions under laparoscopic surveillance, the intrauterine cavity was normalized. The isthmus uteri were flat without diverticulum or remnants. Total operative time was 85 minutes. Intraoperative and postoperative bleeding were minimal. The patient was discharged on postoperative day 3 after an uneventful recovery. Histopathology revealed blood clots with necrotic villi, which was consistent with ectopic pregnancy. Human chorionic gonadotropin normalized after 3 weeks; at final follow-up 12 weeks after surgery, the patient had 3 normal menses.

## 3. Discussion

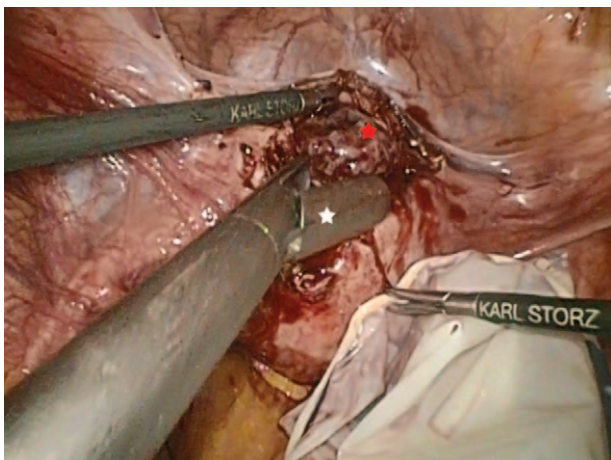
The most probable mechanism of cesarean scar pregnancy is invasion of the myometrium through a microscopic tract, which most often results from previous uterine procedures, such as curettage, cesarean delivery, myomectomy, metroplasty, or hysteroscopy. The obstetric history of this patient was remarkable for 1 cesarean birth and 9 abortions (1 complete drug abortion and 8 by curettage). Because intrauterine adhesions were visualized under hysteroscopy, adhesiolysis was performed, which might improve fertility outcomes in future pregnancies and



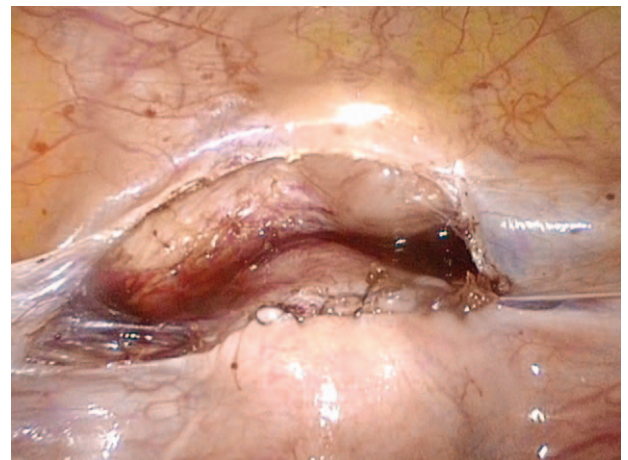
**Figure 3.** (A) After dissection of the pelvic side walls, the superior vesical artery (thick black arrow), uterine artery (thick black arrow), and internal iliac artery (thick red arrow) are seen. (B) The left internal iliac artery (thick red arrow) was occluded with a curved bulldog clip (thin black arrow). (C) The right internal iliac artery (thick red arrow) was occluded with a straight bulldog clip (thin white arrow). (D) The bulldog clips (thin white arrow) contain 2 grooves, making them easy to detach from the arteries (thick red arrow).

reduce the risk of recurrence of cesarean scar pregnancy. We consider it necessary to perform hysteroscopy in cesarean scar pregnancy, especially in women who wish to preserve fertility.

Temporary occlusion of the bilateral internal iliac arteries decreases uterine blood flow by 48% and decreases pulse pressure by 85%.<sup>[4]</sup> Temporary occlusion of the bilateral internal iliac arteries results in better control of bleeding than UAE,



**Figure 4.** The pregnancy tissue (red star) was quickly removed with laparoscopic spoon forceps (white star) and placed in the white endobag.



**Figure 5.** The cesarean scar dehiscence was repaired with a single layer of continuous suture.

because of vascular anastomosis between the uterine artery, vaginal artery, and internal pudendal artery, which are all branches of the internal iliac artery. With adequate bleeding control, laparoscopic adhesiolysis, dissection of the bladder, elimination of the embryo, and suturing may be more leisurely and precise. However, to protect ovarian function, efforts should be made to reduce the time of arterial occlusion, such as completing adhesiolysis before arterial occlusion when the hemorrhage risk is low. One study confirmed uterine artery recanalization with magnetic resonance angiography 4 months after UAE.<sup>[5]</sup> In contrast, the duration of arterial occlusion in our case was only 27 minutes. No complication has been observed to date.

To the best of our knowledge, this is the first reported case of combined hysteroscopy and laparoscopic occlusion of the bilateral internal iliac arteries, with simultaneous repair of a scar diverticulum and treatment of uterine cavity problems with minimal hemorrhage.

We reviewed the literature on the application of internal iliac artery ligation or temporary occlusion in cesarean scar pregnancy. No complications were reported in any of the 3 published cases. The earliest case,<sup>[6]</sup> from 2006, involved bilateral iliac artery ligation followed by dilatation and evacuation under laparoscopic guidance to treat advanced cesarean scar pregnancy. Similarly, one case of iliac artery ligation combined with dilatation and evacuation under emergency circumstances was reported in a case series.<sup>[7]</sup> One case of temporary occlusion of the bilateral iliac arteries followed by ultrasound to confirm no pregnancy remnants was reported.<sup>[8]</sup> In that case, the waiting time before surgery was 7 days, during which there was an ongoing high risk of massive hemorrhage.

Combining laparoscopic and hysteroscopic management has advantages over other treatment methods. First, the scar diverticulum can be repaired laparoscopically, while uterine cavity problems can be treated simultaneously with hysteroscopy. This combined approach might improve fertility outcomes in future pregnancies and reduce the risk of recurrence of cesarean scar pregnancy. Second, the occlusion of the internal iliac arteries was temporary, and no complications of temporary occlusion of the bilateral internal iliac arteries have been reported to date. In contrast, ligation of the iliac artery can lead to irreversible damage, whereas UAE may lead to postembolization syndrome

and other complications. The possible drawbacks of our strategy are also evident. This strategy may be used only in selected patients, and a study with a larger sample size is needed to verify the validity and safety of this method.

In conclusion, temporary occlusion of the bilateral internal iliac arteries seems to be a good strategy to reduce hemorrhage during treatment of cesarean scar pregnancy; hysteroscopy is necessary to deal with intrauterine lesions. Further study with a larger sample size is urgently needed to confirm the validity and safety of temporary arterial occlusion.

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## Author contributions

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