

Laparoscopic Management of Cesarean Scar Pregnancy after Medical Treatment Failure Using Laparoscopic Bulldog Clamps

Maria Claudia Alzamora¹, Stella Lii Blosser^{2*}

¹Department of Obstetrics and Gynecology, MedStar Washington Hospital Center, Georgetown University Hospital, Washington, District of Columbia, ²Department of Obstetrics and Gynecology, Virginia Hospital Center, Arlington, Virginia, United States

Abstract

Cesarean scar pregnancies are a rare complication of pregnancy, with an incidence rate of approximately 1 in 2000 pregnancies. Numerous treatment alternatives have been proposed and published for cesarean scar pregnancies (CSPs), including medical management with local or systemic methotrexate injection, resection through hysteroscopic, vaginal, abdominal or laparoscopic approach, and dilation and curettage. Concomitant strategies for achieving hemostasis/bleeding control have been attempted, including uterine artery embolization, the placement of a Foley balloon catheter, injection of vasopressin, and less commonly reported, the use of vascular clamps. We describe a case of failed medical management of a CSP, followed by laparoscopic resection with the use of vascular clamps to minimize bleeding. This approach can be considered for minimizing blood loss in the laparoscopic management of cesarean ectopic pregnancies.

Keywords: Cesarean scar pregnancy, ectopic pregnancy, vascular clamps

INTRODUCTION

A cesarean scar pregnancy (CSP) is defined by a gestational sac (GS) embedded in the myometrium of a cesarean scar.^[1] It is a rare complication of pregnancy, with an incidence rate of approximately 1 in 2000 pregnancies, which has notably increased due to the increase rate of cesarean deliveries and advanced diagnostic tools.^[1,2] There are two types: Type I (endogenic) – with growth toward the uterine cavity and Type II (exogenic) – with deep invasion of the uterine defect across the uterine serosa toward the bladder and abdominal cavity.^[3] Risk factors include previous cesarean sections, smoking, or diabetes mellitus, which affects wound healing and leads to the formation of fluid-filled myometrial defects known as niches, where implantation can occur.^[4]

Numerous treatment alternatives have been proposed for CSPs, including medical management with local

or systemic methotrexate (MTX) injection, resection through hysteroscopic, vaginal, abdominal or laparoscopic approach, and dilation and curettage (D and C). Expectant management is not recommended due to the risk of serious maternal morbidity.^[5] The main challenge is minimizing hemorrhage, as there is insufficient myometrial tissue to constrict exposed blood vessels after placental separation to contain bleeding.

Concomitant strategies for achieving hemostasis/bleeding control have been attempted, including uterine artery embolization (UAE), placement of a Foley balloon catheter, injection of vasopressin, and less commonly reported, the use of vascular clamps.^[1,6,7] Herein, we describe a case of failed medical management of a CSP, followed by laparoscopic resection with the use of vascular clamps to minimize bleeding.

Address for correspondence: Dr. Stella Lii Blosser, 5999, Burke Commons Road, Burke, VA 22015, United States. E-mail: stella.l.blosser@kp.org

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CASE REPORT

A 42-year-old female G4P3013 presented to the office after 8 weeks of amenorrhea, with cramping abdominal pain and vaginal spotting. She was noted to have a rising serum quantitative β -human chorionic gonadotropin (b-HCG) level from 7284 to 26,975 mIU/mL in 1 week. Her past obstetric history was remarkable for three previous lower transverse cesarean sections, the last one being 13 years prior. Upon physical examination, vital signs were stable and a bimanual examination revealed an 8-week sized uterus. Transvaginal ultrasound showed a heterogeneous endometrium, no GS, but a cystic 1.9 cm anterior mass at the site of old cesarean scar, with peripheral flow but no fetal pole identified. On further imaging, the anterior lower uterine segment appeared enlarged with a GS of 5–8 mm, with mild flow on color Doppler, bulging into the anterior cul-de-sac.

Given the small size of the GS, lack of fetal pole and overall clinical stability, medical management was initially opted for: the patient received MTX 50 mg/m² on day 1, with uptrending b-HCG on day 4 – 37,981 mIU/mL, followed by a second dose on day 7, after which b-HCG levels were noted to decrease in a steady but slow fashion, and reached a plateau of 34 mIU/mL 3–4 months later, with persistent visualization on ultrasound of a 1.89 mm \times 1.84 mm \times 2.76 mm complex bulging anteriorly from the lower uterine segment.

The patient desired no future fertility, and surgical management was decided. Initial inspection under laparoscopy revealed a densely adherent bladder to the lower uterine segment. A bladder flap was initiated but it was noted that there was a bulge in the bladder flap midline where the cesarean ectopic was expected to be. The blood supply was first secured before entering into the space of the ectopic. The right retroperitoneal space was opened with the harmonic scalpel, and the right ureter was identified. A bulldog vascular clamp was placed on the right uterine artery at its origin from the hypogastric artery. On the left side, the retroperitoneal space was opened. The artery was in close proximity to the ureter, so the vascular clamp was placed along the side of the uterus at the cornua down toward the uterine vessels. The bladder was then dissected off the lower uterine segment. To help identify the planes, a sponge stick was placed into the anterior vaginal fornix, and the cervix was identified from a lateral approach from within the paravesical space. The bladder was then undermined over the cervix, and the adhesions were transected superiorly. A Harris-Kronner (HUMI) uterine manipulator was introduced into the uterus. The harmonic scalpel was used to score the uterine serosa over the ectopic pregnancy. A defect of about 3 cm was made transversely. The sac of the pregnancy was clearly visualized. The ectopic pregnancy was dissected out and removed [Figure 1]. The

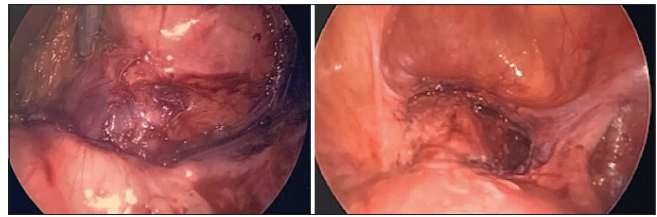


Figure 1: Cesarean scar ectopic (left). Visualization after removal of cesarean scar ectopic (right)

defect was closed with 2-0 V-Loc in a running fashion. The vascular clamps were removed. Excellent hemostasis was seen. Postoperative course was uncomplicated, and the patient was discharged on the day of surgery. Pathology showed chorionic villi, consistent with products of conception.

DISCUSSION

CSPs are a matter of growing concern due to increased incidence of cesarean section rates and improved diagnostic capabilities through the use of early diagnostic ultrasound. It is a potentially life-threatening condition due to its associated complications, which include hemorrhage, shock, placental adherence spectrum, uterine rupture, and need for emergent procedures.^[3,8] For this reason, expectant management is usually not recommended.

The initial clinical presentation includes vaginal bleeding and abdominal pain, although up to one-third of patients remain asymptomatic and are diagnosed only through ultrasound. The ultrasonographic criteria of CSP include the absence of an intrauterine gestation and empty endocervical canal, a GS in the anterior isthmus or lower uterine segment, with a thin or absent layer of myometrium, as well as positive color Doppler flow. Further imaging, such as magnetic resonance imaging, can determine exact location, extent of invasion, and bladder involvement.^[3,8]

Although over 30 treatment regimens for CSP have been reported previously, there is still no consensus on preferred management, and thus, individual characteristics must be taken into consideration for adequate therapy, including clinical scenario, desire for future fertility, b-HCG levels, presence of cardiac activity and GS measurements, as well as type and extension/progression of the CSP and patient preference.^[5]

Medical management has been commonly used for the treatment of ectopic pregnancies with a b-HCG value less than 5000 mIU/mL, and found to be effective for gestational age under 8 weeks, and absent fetal cardiac activity.^[1,9] Pharmacological therapy includes systemic versus local administration of MTX, as well as potassium chloride or hyperosmolar glucose solution injection to the GS under ultrasound guidance.^[3,4] The reported success rate of systemic or local injection of MTX varies widely, ranging from 8.7% to

69.2%,^[1,9] with conflicting evidence over the efficacy of one over the other and studies suggesting a higher success rate when used in combination. The main theoretical disadvantage of systemic MTX is the decreased permeation into the products of conception due to the surrounding nonvascularized scar tissue; however, some studies show shorter remission time for b-HCG and CSP disappearance with systemic MTX alone.

Conversely, several surgical techniques have been proposed, including hysteroscopy, D and C, as well as laparoscopy, laparotomy, or even a transvaginal approach. Hysteroscopy is preferred for the management of Type I CSP, and resection can be attempted with the use of a loop electrode. D and C alone can be associated with higher rates of complications, as exposure of the vessels with sharp curettage can lead to uncontrollable bleeding.^[1] Moreover, laparoscopy can be a more suitable approach in the case of Type II CSP, with a reported success rate of up to 97%.^[9]

Regardless of the preferred approach, controlling the bleeding in a CSP excision can pose a great challenge due to increased vascularity in ectopic pregnancies and decreased muscle grid to contain the bleeding found in a previous uterine scar. For this reason, bleeding control techniques are used conjunctively. These include electrocoagulation, mechanical compression with an intrauterine Foley balloon, injection of dilute vasopressin into the overlying myometrium, UAE, and less commonly mentioned, vascular clamps.^[1,4,5]

The use of vascular clamps has been described, with a report of clipping of the anterior trunks of the hypogastric arteries or the utero-umbilical trunks.^[6,7] In our case, a clamp was placed on the right uterine artery and another along the left side of the uterus from the cornua down toward the uterine vessels due to difficult dissection on this side. We found that this alone controlled the bleeding and allowed for a simple resection of the CSP. This approach is used commonly in gynecologic surgery to decrease intraoperative blood loss, as they can be placed and removed safely with a controlled duration of reduced blood supply.

Bulldog vascular clamps are often readily available and are used for vascular control during other gynecologic procedures such as laparoscopic myomectomy. They come in various lengths and with curved or straight tips, making them quite versatile [Figure 2]. They can be placed on the uterine artery directly in the retroperitoneal space if the surgeon is comfortable with this dissection. However, they can also be used on the uterus at the level of the cervix once the vessels are skeletonized or placed on the utero-ovarian vessels for transient occlusion.^[10] Nevertheless, there are complications associated with this technique, like damage to adjacent structures and vasculature, and formation of adhesions in the retroperitoneal space due to dissection during



Figure 2: Bulldog vascular clamps

clamp placement.^[10] This approach can be considered for minimizing blood loss in the laparoscopic management of cesarean ectopic pregnancies.

Ethical statement

A case report is a medical/educational activity that does not meet the definition of research; therefore, the activity does not have to be reviewed by the IRB unless the case report includes more than three clinical cases.

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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