

# Laparoscopic Excision of Cesarean Scar Ectopic Pregnancy: An Optimum Management Option

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## Abstract

Cesarean scar ectopic pregnancy is a leading cause of life-threatening complications in the first trimester. It poses a diagnostic and management challenge; if not diagnosed and adequately treated in early pregnancy, it may lead to considerable maternal morbidity and mortality. We report a case series of cesarean scar ectopic pregnancies managed successfully by laparoscopy. Laparoscopic excision is the gold standard management approach for cesarean scar ectopic pregnancy.

**Keywords:** Cesarean scar, ectopic pregnancy, laparoscopic excision

## INTRODUCTION

Although rare (0.05%), the incidence of cesarean scar ectopic pregnancy (CSP) is increasing nowadays. The estimated incidence of CSP among overall cesarean deliveries is 1/1800–1/2500.<sup>[1]</sup> It happens due to pregnancy implantation into the myometrium through a microscopic dehiscent tract at a prior hysterotomy or cesarean scar. The diagnosis of CSP is challenging because it is often mistaken as low-lying pregnancy, cervical ectopic, or spontaneous abortion in the process.

CSP is classified into three types (I, II, and III). Type I (or endogenic) CSP implants on the cesarean scar and grows toward the endometrial cavity, whereas type II or III (exogenic) CSPs implant deep in a cesarean scar defect and grow toward the abdominal cavity.<sup>[2]</sup> Exogenic CSP (type II or III) is a significant cause of early pregnancy-related mortality, leading to life-threatening complications (excessive hemorrhage and uterine rupture).<sup>[3]</sup>

The treatment goals are the prevention of life-threatening complications and the preservation of future fertility. The best

management approach is yet to be determined; however, there is a persistent risk of hemorrhage after medical management as the vascular trophoblastic tissue degenerates, so surgical management should be preferred over medical management.

We managed three consecutive cases of CSP laparoscopically. This report describes the steps of laparoscopic excision of type III CSP.

## CASE REPORTS

### Case 1

A 34-year-old female, G2P1 L1, previous cesarean, presented to the emergency department with amenorrhea and pain at the cesarean scar site. Transvaginal ultrasonography (USG) showed an empty uterine cavity, with a live fetus of 6 week's gestation in the lower uterine segment anteriorly with choriodecidual reaction and excessive vascularity, and overlying myometrium could not be delineated separately, suggestive of type III CSP (exogenic type).

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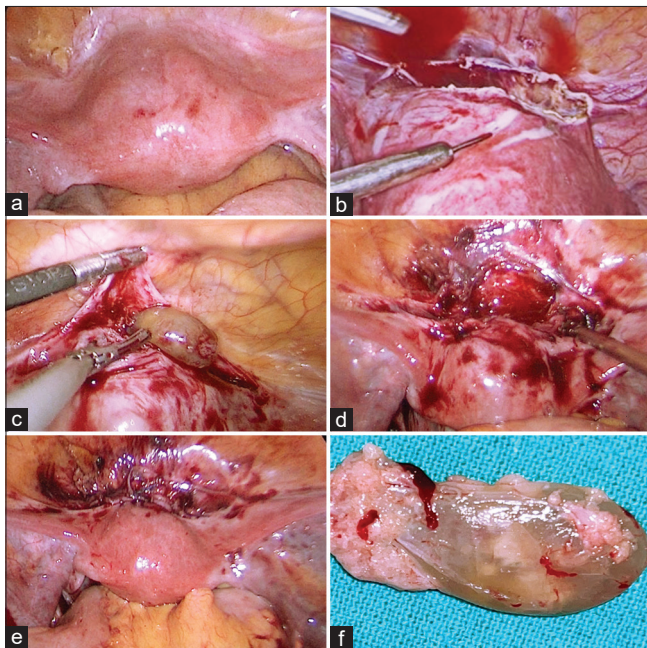
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The cervical canal and bilateral adnexa were clear. The baseline beta-human chorionic gonadotropin (hCG) level was 14391 mIU/mL, and the repeat value on day 4 was 47591 mIU/mL. General physical examination and vitals were within normal limits. Mild tenderness was noted at the cesarean scar site. On bimanual examination, the cervix was healthy, the uterus was bulky, and bilateral fornices were free and nontender. In view of the high beta-hCG value and patients' unwillingness to local instillation of methotrexate or KCl and follow-up, laparoscopic excision of CSP was planned.

On laparoscopy, the uterus was mildly enlarged, and bilateral adnexa appeared normal. The uterovesical fold was opened to expose the scar site. Vasopressin was injected into the myometrium of the lower uterine segment to minimize blood loss. An incision was made over the scar site with a harmonic ace, and a gestational sac was seen coming out of the defect. The entire sac was delineated, scarred tissue was excised thoroughly, and the freshened myometrium was closed with delayed absorbable suture in double layers. Products of conception were removed using an endo-bag. Figure 1 depicts the steps of laparoscopic excision of CSP. Histopathology confirmed the diagnosis of the product of conception.

Her postoperative period was uneventful. Follow-up was done with weekly serum beta-hCG till a nonpregnant value was achieved.



**Figure 1:** (a) Laparoscopic image showing mildly enlarged uterus; (b) Instillation of vasopressin into lower uterine segment; (c) En-bloc removal of scar ectopic pregnancy; (d) Margins freshened at scar site; (e) Defect sutured in 2 layers with delayed absorbable suture; (f) Product of conception after removal

## Case 2

A 36-year-old female G6P3 L3A2 patient with one previous cesarean section and two dilatation and curettage (D and C) procedures presented to the emergency department with a USG report suggesting CSP. The patient was stable on examination, with no signs of acute distress. Her USG showed a 7 + 1 weeks' live embryo, and a gestational sac was located in the lower uterine segment with thinning of the anterior myometrium. The diagnosis of exogenic CSP was further confirmed with magnetic resonance imaging (MRI). Her beta-hCG value was 69,661 mIU/mL on admission. Minimally invasive laparoscopic scar ectopic excision was performed. Per operatively, the scar was thinned out, a gestational sac of 3 cm × 2 cm was excised, and the scar was reinforced in two layers. The patient's condition remained stable. There were no immediate postoperative complications, and was discharged on the postoperative day 3.

## Case 3

G5P2 L2A2 female with previous two cesarean sections presented to the emergency department with amenorrhea and abdominal pain. USG showed a 2.2 cm × 1.6 cm × 2.2 cm gestational sac located in the anterior wall of the lower segment, with no myometrium anterior to it and a live embryo corresponding to 6 + 1 weeks gestation, suggestive of an exogenic CSP. The patient's beta-hCG was 15,000 mIU/mL on admission. Vitals were stable at the time of admission. She also received an injection of methotrexate outside but planned for laparoscopic excision of CSP because the patient did not want to take the risk of impending rupture and follow-up. Peroperatively, the gestational sac measuring 2 cm × 2 cm was noted at the previous scar site, excision was done, and the freshened scar was reinforced in two layers. The patient was discharged on the 3<sup>rd</sup> postoperative day.

## DISCUSSION

The clinical presentation of a CSP ranges from vaginal bleeding to uterine rupture and hypovolemic shock.<sup>[4]</sup> Hence, the early and accurate diagnosis of scar pregnancy is crucial. The diagnosis of CSP is typically based on USG findings. The proposed USG diagnostic criteria include:<sup>[5]</sup>

1. Presence of a gestational sac in the anterior part of the lower uterine segment
2. An empty uterine and cervical cavity
3. Absence of myometrium between the posterior wall of the bladder and gestational sac (to differentiate CSP from cervical ectopic).

Whereas MRI can be used as an adjunct in inconclusive cases. With improved differentiation of soft tissue structures and spatial resolution, MRI clearly shows the gestational sac in the anterior lower uterine segment, any possibility of myometrial

**Table 1: Published reports of cesarean scar ectopic pregnancy management<sup>[9]</sup>**

Initial treatment modality	Number of cases	No additional treatment needed	Additional treatment needed-nonsurgical	Additional treatment needed-surgical
Expectant management	14	5	3	6
Local treatment (mtx/KCl)	22	3	-	19
				16 D and C
				3 aspiration
Systemic (mtx)	22	8	3 UAE	11
				1 D and C
				2 aspiration
				8 laparotomy
Local + systemic	13	11	1 UAE	1 aspiration
D and C	51	19	17 mtx	32 laparotomy
			2 UAE	
UAE	9	-	6 mtx	3 laparotomy
Hysteroscopy	3	-	1 mtx	2 laparotomy
Laparotomy	6	6		
Laparoscopy	18	15	1 mtx	1 D and C
				1 laparotomy
Hysterectomy	4	-	-	-

D and C: Dilatation and curettage, UAE: Uterine artery embolization

invasion, and bladder involvement. It is also used to measure the gestational sac volume and evaluate the pelvic anatomy, which can improve the intraoperative orientation.

Hameed MS *et al.*<sup>[6]</sup> suggested three management options-expectant, medical, and surgical. Expectant management carries a very high risk of uterine rupture and hysterectomy; it should be considered only in cases without fetal cardiac activity or spontaneous resolution. Medical approaches include systemic or local administration of methotrexate, KCl, or combination under USG or laparoscopic guidance. It requires follow-up till complete resorption and has a risk of severe hemorrhage. In addition, medical management might result in an isthmocele development and recurrence of CSP in subsequent pregnancies (34.3%).<sup>[7]</sup>

Surgical options are suggested in cases of failed medical management or hemodynamically unstable patients. Hysteroscopic excision was preferred in endogenic, and laparoscopic excision was preferred in exogenic CSP. The most efficacious treatment modality with a low complication rate is laparoscopy, as it allows simultaneous revision of a cesarean scar. Other minimally invasive surgical options reported are selective uterine artery embolization, D and C, and hysteroscopic removal.<sup>[8]</sup> However, the success rate of these procedures was very low compared to the laparoscopic excision, and these patients required additional surgical management in the form of emergency laparotomy, as shown in Table 1.<sup>[9]</sup> More aggressive surgical management might be needed, such as myometrial wedge excision through laparoscopy or laparotomy, depending on the clinical presentation, and hysterectomy is the final resort.

Laparoscopic excision of CSP seems to be the most promising approach in the current era and should be considered the first line of management as it completely excises the CSP, allows freshening and multilayer closure of scar, obviates the risk of hysterectomy in > 95% of cases, has a shorter follow-up, less probability of isthmocele development and recurrence.<sup>[10]</sup>

To conclude, the gold standard management option for CSP is laparoscopic excision.

### Author contributions

KK, DM, RM, and AD were involved in the patient management under the supervision of JC. KK and DS drafted the manuscript and reviewed the literature. All authors critically evaluated the manuscript. All authors contributed to and approved the final version of the manuscript.

### Ethics approval

This study was approved by the appropriate research ethics committee (Approval number: AIIMS/IEC/23/325).

### Declaration of patient consent

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

### Data availability statement

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

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## Conflicts of interest

There are no conflicts of interest.

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