

Laparoscopic Management of Caesarean Scar Pregnancy: A Case Series

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ABSTRACT

Caesarean scar pregnancy (CSP) is a pregnancy where embryo is implanted in the myometrium of a previous caesarean scar and it is a rare type of ectopic pregnancy. Diagnosis and management of CSP is a challenge because caregivers lack awareness about the possibility of implantation in previous caesarean surgery scar. We present here six CSP cases. All patients presented with abdominal pain and/or bleeding per vaginum with history of previous caesarean section. On ultrasonography, caesarean scar pregnancy was diagnosed. We managed them endoscopically at an endoscopic surgery and training center during the year 2019 till the year 2022. The pre-operative and post-operative periods were uneventful and they were discharged on day 2 or 3 of surgery. Hystero-laparoscopic combined approach is a good option for managing CSP in expert hands. Although there are no clear guidelines for managing CSP, we suggest individualizing each patient's treatment plan, depending on their personal characteristics and available facilities at the managing center.

Keywords: caesarean scar, pregnancy, ectopic pregnancy, uterine rupture, hysteroscopy

INTRODUCTION

Caesarean scar pregnancy (CSP) is a pregnancy where an embryo is implanted in the myometrium of a previous caesarean scar, and it's a rare type of ectopic pregnancy.¹ It forms 0.04–0.05% of all pregnancies.² Caesarean scar ectopic incidence has increased these days due to an increase in the number of caesarean deliveries and more use of ultrasonography in early pregnancy.³ A delay in its diagnosis may lead to increased maternal morbidity and mortality due to rupture and hemorrhage.

The CSP is of two types, Type I (endogenic type) is where the embryo remains implanted in the scar and grows towards the uterine cavity, and Type II (exogenic type) is where the implanted pregnancy grows towards the abdominal cavity. Early uterine rupture is more common in Type II CSP.^{4,5}

We are presenting here six CSP cases managed by a hystero-laparoscopic combined approach in which definitive management was done, at an endoscopic surgery and training center, during the years 2019 to 2022. Informed consent of the patients was taken in each case. Ethical clearance from the institutional ethical committee was obtained.

CASE 1

A 32-year-old G2P1 with a previous caesarean section one year ago, presented at eight weeks of gestation with bleeding per vaginum and lower abdominal pain for one day

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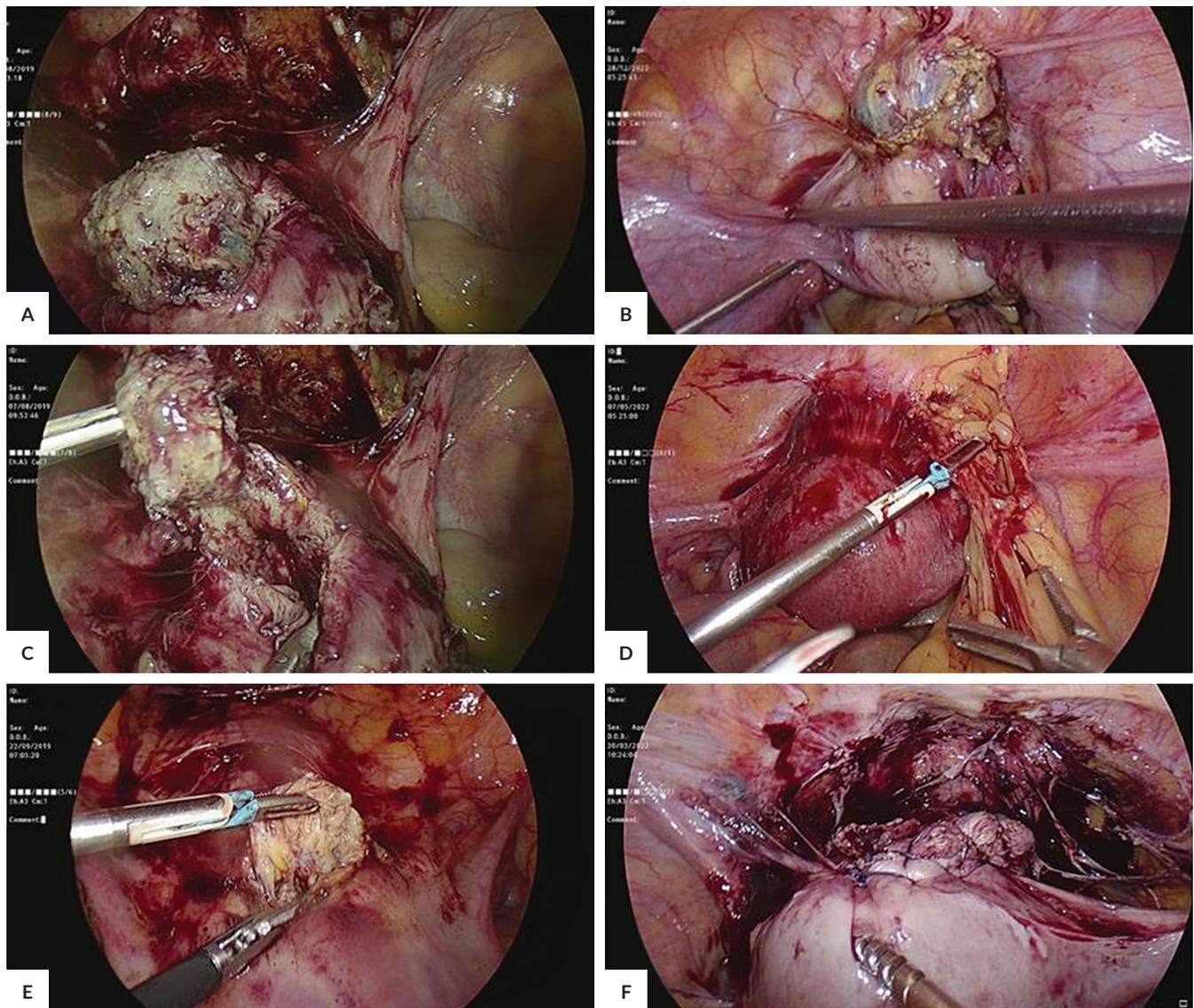


Figure 1. Intraoperative pictures of laparoscopy. (A) Ruptured scar ectopic pregnancy, (B) Impending rupture with caesarean scar ectopic pregnancy, (C) Ruptured scar ectopic pregnancy, (D) Scar area with dense adhesions, (E) Scar area after removing adhesions, (F) Scar area after excision and suturing.

in low general condition. There was no history of trauma, pelvic inflammatory disease in three months, or fever. There was no significant past medical or family history relevant to the case. On examination, pallor was of severe grade, tachycardia, and blood pressure was 100/60 mmHg. Lower abdominal tenderness was present, and shifting dullness was present. Bi-manual examination revealed a bulky uterus with cervical motion tenderness and nonpalpable adnexa. Abdominal ultrasound revealed a large amount of free fluid in the peritoneal cavity with an embryo of 66 mm with the presence of fetal cardiac activity, and a distance from the bladder within an invasion was 4 mm (Type II CSP) (Table 1). Diagnostic laparoscopy was performed, which showed an adherent bladder to the uterine wall and a previous scar

was ruptured with hemoperitoneum and the gestational sac was bulging through the previous scar with bulky uterus. (Figure 1A). Products of conception was removed hystero-laparoscopically and scar margins were refreshed. Re-strengthening the scar in a double layer was done. Blood loss was limited in this procedure. Two units of blood were transfused. The post-operative period was uneventful. The patient was discharged on the next day after surgery in satisfactory condition.

CASE 2

A thirty-year old G3P2 with previous two full-term caesarean sections 10 years and three years back, respectively,

Table 1. Patients' Demographics, Clinical Characteristics, and Outcomes

Characteristics	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Age	32	30	35	33	34	28
Gravida status	G2P1L1	G3P2L2	G5P2L2A2	G3P2L2	G4P2L2A1	G2P1L1
No. of previous caesarean	1	2	2	2	2	1
Presenting complaint	Pain in the abdomen and slight bleeding per vaginum	Dull aching pain	Severe pain in the abdomen and bleeding per vaginum	Severe pain in the abdomen and bleeding per vaginum	Severe pain in the abdomen and bleeding per vaginum, tenderness in lower abdomen	Severe pain in the abdomen and bleeding per vaginum
History of curettage in previous pregnancy	No	No	Yes	No	Yes	No
History of curettage in present pregnancy	No	No	No	No	No	No
History of MTP pill intake	No	No	No	No	Yes	No
Gestational age	8 weeks	6 weeks	6.5 weeks	7.2 weeks	7 weeks	8 weeks
Ultrasonography	Large amount of free fluid in the peritoneal cavity with an embryo with cardiac activity, 4 mm from the bladder within an invasion.	Gestational sac seen embedded in previous scar area, in lower uterine part.	Type 1 CSP, gestational sac seen in lower uterine segment blighted ovum.	Empty uterine cavity and cervical canal, along with thin or absent myometrium between the gestational sac and the bladder with moderate hemoperitoneum.	Irregular margined uterus with bulge anterior at scar area and dense irregular 9 mm echoes in uterine cavity.	Gestational sac in the anterior myometrium (in the area of the previous uterine scar) with an empty uterine cavity with positive cardiac activity.
Outcome	Discharged in satisfactory condition on post-operative day 2	Discharged in satisfactory condition on post-operative day 2	Discharged in satisfactory condition on post-operative day 2	Discharged on day 3 in satisfactory condition.	Discharged in satisfactory condition on post-operative day 2	Discharged in satisfactory condition on post-operative day 2
Peri-operative complications	None	None	None	None	None	None

presented at six weeks of gestation and had been experiencing dull pain in her lower abdomen for 15 days. There was no significant past medical or family history relevant to the case. The physical examination, including bimanual examination, was within normal limits. Her abdominal ultrasonography showed irregular scar area, echogenic material at the level of the previous scar measuring 3.8x4.44 centimeters, infiltrating in the myometrium, suggestive of scar ectopic pregnancy (Type II CSP). No history of bleeding per vaginum or severe pain in the abdomen, loss of consciousness, or trauma to the abdomen.

On blood investigations, serum β -hCG level was 6500 IU/L. All the other relevant investigations were within normal limits. She was managed surgically by combined laparoscopy and hysteroscopic approach; the products of conception were removed from the previous scar area in the uterus, and the uterine closure was done in a double layer (Table 1 and Figure 1B). She had an uneventful hospital stay after surgery and was discharged on the second post-operative day.

CASE 3

A 35-year-old G5P3+2 with previous two full-term caesarean sections presented at 6.5 weeks of gestation with severe pain in the lower abdomen along with bleeding per vaginum for five days. There was no history of trauma to the abdomen or loss of consciousness. Her abdominal ultrasonography revealed a fetal pole of gestational age six weeks at lower-than-normal position. Transvaginal ultrasound revealed bulging at the previous scar site with small fluid in the endometrial cavity and sac invading in myometrium at the previous scar level, suggestive of CSP. Hystero-laparoscopic excision of scar and removal of products of conception, followed by uterine repair in double layer with bilateral salpingectomy was performed (Table 1 and Figure 1C). She had an uneventful hospital stay after surgery and was discharged on the second post-operative day.

CASE 4

A 33-year-old G3P2+0 with previous two full-term caesarean sections presented at 7.2 weeks of gestation with

bleeding per vaginum and pain in the lower abdomen for 15 days. There was no history of trauma. There was no significant past medical or family history relevant to the case. Severe pallor along with lower abdominal tenderness was present on examination. A bulky uterus with bilateral forniceal tenderness was present on bimanual examination. Ultrasound revealed an empty uterine cavity and cervical canal with a gestational sac in the anterior myometrium (at uterine scar site) with absent myometrium between the gestational sac and the urinary bladder with moderate hemoperitoneum (Type II CSP). Scar dehiscence with hemoperitoneum was seen with dense adhesions on laparoscopy (Table 1 and Figure 1D). Hystero-laparoscopic adhesiolysis with the removal of products of conception with re-strengthening of the scar in a double layer, was done. Two units of blood were transfused. She had an uneventful recovery and the patient was discharged on third post-operative day.

CASE 5

A 34-year- G4P2+1 with previous two caesarean sections presented at seven weeks of gestation with pain in the lower abdomen and bleeding per vaginum for five days following abortifacient intake. No history related to trauma was present. There was no significant past medical or family history relevant to the case. Mild pallor and lower abdominal tenderness were present on examination. Bimanual examination revealed eight-week-size uterus with fornix tenderness. Her β -HCG level was 9,650 IU/L on presentation. Her abdominal ultrasound showed irregular margined uterus near the previous scar with a bulge anteriorly at the scar area and dense irregular 9 mm echoes in the uterine cavity at the same place. Laparoscopic adhesiolysis with the removal of scar ectopic through hysteroscopy with bilateral salpingectomy was done. (Table 1 and Figure 1E). Patient was discharged on the second post-operative day in satisfactory condition.

CASE 6

A 28-year-old G2P1+0, with a previous caesarean section at full term, presented at eight weeks of gestation with bleeding per vaginum. There was no history of trauma or fever. There was no significant past medical or family history relevant to the case. On examination, mild pallor with lower abdominal tenderness was present. Eight-week-size uterus was found on bimanual palpation. Ultrasonography revealed a fetal pole with cardiac activity in the anterior myometrium (at the uterine scar site) with an empty endometrial cavity. CSP was suspected. Her β -HCG level was 11,050 IU/L. Diagnostic laparo-hysteroscopy was performed followed by adhesiolysis and removal of products of conception, and re-strengthening of the scar was done in double layers. Products were sent for histopathological examination (Table 1 and Figure 1F). The post-operative period of the patient was uneventful and the patient was discharged on the second post-operative day.

All six patients in our series were referred to us without having undergone any prior medical or surgical intervention for their caesarean scar pregnancy. Upon diagnosis through transvaginal ultrasonography, each case was managed successfully through a hystero--laparoscopic approach. This allowed for direct visualization, precise excision of the ectopic gestational tissue, and simultaneous repair of the uterine scar defect. This is similar to laparotomy whereas due to small incision in hystero-laparoscopic approach, the patient feels less pain and early recovery and discharge from hospital. The outcomes were favourable in all cases, with minimal intraoperative complications, satisfactory post-operative recovery, and preservation of future fertility potential. All patients were discharged on post-operative day 2 or day 3 and were followed up for 1.5 months with no complaints. All patients attained their normal menstrual functions.

DISCUSSION

As caesarean scar ectopic is the rarest ectopic (0.04-0.05% of total pregnancies), few cases are reported and are managed by different approaches.²

The transvaginal ultrasound is the first modality to diagnose CSP and it is 86.4% sensitive for diagnosing CSP.⁶ The ultrasound criteria for diagnosis of CSP are the absent intrauterine gestation sac with an empty cervical canal, and presence of a gestational sac at the isthmus of the uterus at the caesarean scar site with thin or absent myometrium between the gestational sac and the urinary bladder.⁷

Presently, many medical as well as surgical treatments are available that include expectant management, local methotrexate (MTX), systemic MTX, dilation and evacuation (D&E), uterine artery embolization, hysteroscopic resection of ectopic pregnancy, laparoscopy, and laparotomy for managing the CSP cases.² However, at any time while using these modalities, a massive hemorrhage may warrant a hysterectomy. The outcomes are different for each method and the decision depends on the patient's condition at the time of diagnosis and the patient's desire for future fertility.

As expectant management may lead to uterine rupture and hemorrhage at any time during management, it may not be a better option for managing CSP cases.⁸ Systemic administration of methotrexate (MTX) with a dose of 50 mg/m² body surface area (BSA) can also be used for managing CSP, however, it is commonly used in hemodynamically stable patients. If medical management is not effective, it can be converted to a surgical approach. It is called sequential management.⁹

Attempted D and E or systemic methotrexate (if not effective) can lead to massive hemorrhage and shock in CSP. Laparotomy followed by resection of the ectopic sac or hysterectomy becomes inevitable in these cases. These days, the laparoscopic approach for caesarean scar pregnancy excision is being practiced by many surgeons.^{9,10}

Identification of ectopic pregnancy was done first by laparoscopy, followed by excision of ectopic tissue using cautery, and tissue removal done through one of the port sites and then port site defect was repaired in double layers. Laparotomy is the treatment of choice in hemodynamically unstable patient or in cases where hysterectomy may be needed.

In this case series, all six cases were managed by combined hystero-laparoscopic approach. Excision followed by removal of ectopic scar pregnancy with restrengthening of the scar and uterine preservation was done. While in the cases presented by other authors, they have done medical management, laparotomy or only hysteroscopic evacuation of pregnancy.

In a study by Yin et al. in 2015 on 359 patients, they compared four modalities to treat CSP and concluded that hysteroscopic surgery without pretreatment can be adopted for patients with Type I CSP, whereas patients with Type II CSP should be initially pretreated with vascular ligation to prevent intraoperative bleeding, followed by laparoscopic or vaginal surgery.¹¹

From the patient perspective, the treatment received was largely viewed as positive and reassuring. Most patients expressed relief at the timely diagnosis and prompt surgical intervention, which prevented further complications and preserved their uterus. The minimally invasive hystero-laparoscopic approach was appreciated for causing less post-operative discomfort, shorter hospital stays, and a quicker return to daily activities. Patients also felt supported and well-informed throughout the process, especially regarding the nature of their condition and the rationale behind the surgical management.

Strength and Limitations

This case series highlights the successful use of a combined hystero-laparoscopic approach for managing caesarean scar pregnancies (CSP), showcasing several strengths. The minimally invasive technique allowed precise removal of products of conception and effective uterine scar repair, leading to favorable maternal outcomes with minimal morbidity. The approach demonstrated the feasibility of preserving uterine integrity, especially in symptomatic cases, and emphasized the role of early diagnosis and surgical expertise in preventing complications such as uterine rupture and massive hemorrhage. Ethical compliance and real-world clinical application from a specialized endoscopic center further strengthen the relevance of the findings.

However, the series has notable limitations. The small sample size and single-center design limit the generalizability of the outcomes. Additionally, the lack of a control group or comparison with other treatment modalities such as medical management or embolization restricts broader conclusions. Long-term reproductive outcomes, including recurrence rates and future fertility, were not evaluated, which limits understanding of the extended impact of the surgical intervention. Despite these limitations, the series

adds valuable insight into the evolving surgical management of CSP in resource-adequate settings.

CONCLUSION

Caesarean scar pregnancy is a rare but potentially life-threatening form of ectopic pregnancy. Its incidence is increasing due to the rising rate of caesarean deliveries and the widespread use of early pregnancy ultrasonography. Prompt diagnosis and appropriate management are crucial to avoid catastrophic complications like uterine rupture and severe hemorrhage.

This case series highlights the importance of early recognition and a multidisciplinary, minimally invasive approach in the successful management of CSP. All six cases in our series were effectively managed using a combined hysteroscopic-laparoscopic technique, which allowed precise localization, complete removal of products of conception, and definitive scar repair. The approach minimized blood loss, preserved uterine integrity, and enabled rapid post-operative recovery with minimal morbidity.

Our experience emphasizes that, in carefully selected patients, hystero-laparoscopic management can be a safe, effective, and fertility-preserving strategy for caesarean scar pregnancy, particularly in centers equipped with advanced endoscopic expertise.

Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

Author Disclosure

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