

Laparoscopic Management of Caesarean Scar Pregnancy: A Case Series

Virupaksha A¹, Soumya Rajshekar Patil², Jayashree S³, Madhuri N⁴

ABSTRACT

Caesarean scar pregnancy (CSP) stands as a unique variety of ectopic gestation. The incidence is on rise ever since the steady rise with the number of caesarean (C-section) deliveries and improved technology. By means of sonography in the past few decades, there has been a rise in detection rates of CSP. Life threatening complications, such as uterine rupture, hemorrhage, hypovolemia, and even death, are associated with CSP. Literature on scar ectopic is sparse, it is essential to report all cases of C-section scar ectopic so as to get a better understanding of its management as well as to create awareness on the possibility of this entity. In this regard, we are reporting three cases of C-section scar ectopic which were successfully managed by laparoscopy.

Keywords: Caesarean scar pregnancy, Laparoscopic excision of cesarean scar ectopic, Scar ectopic.

World Journal of Laparoscopic Surgery (2021); 10.5005/jp-journals-10033-1528

BACKGROUND

Caesarean scar pregnancy stands as a unique variety of ectopic gestation where the implantation occurs within the muscle or fibrous tissue of the scar after a previous C-section. The condition was first described in 1978 by Larsen and Solomon.¹ The incidence ranges from 1 in 1800 to 1 in 2216 pregnancies.² Caesarean scar pregnancy accounts for 6.1% of all ectopic pregnancies, and 0.15% of pregnancies with previous scar.³ Ever since the steady rise with the number of C-section deliveries and improved technology by means of sonography in the past few decades, there has been a rise in detection rates of CSP.

The ultrasound diagnostic criteria of scar ectopic gestation include the undermentioned:

- Anterior part of the lower uterine segment demonstrates a gestational sac within.
- An empty uterus and cervical canal.
- Absence of a layer of myometrium between the bladder wall and the sac, a crucial point in differentiating scar pregnancy from cervical pregnancy.⁴

Most of the CSPs are reported in the first trimester. Although rare, CSP can present at latter period of gestation with catastrophic complications. One case of CSP has been reported at 35 weeks of gestation during which hysterectomy had to be performed.⁵

Complications related to CSP can be serious and include uterine rupture, severe life-threatening hemorrhage, hypovolemia, and even death. If left undiagnosed, it may lead to abnormally invasive placenta and immense vascularity at the site of implantation and poor contractility of the lower segment resulting in tremendous hemorrhage which can become challenging to regulate.^{1,6}

Since the literature on scar ectopic is sparse, it is essential to report all cases of C-section scar ectopic so as to get a better understanding of its management as well as to create awareness on the possibility of this entity when we are treating a pregnant woman with previous C-section with an aim to timely diagnose and treat before complications set in. In this regard, we are reporting three cases of C-section scar ectopic which were successfully managed by laparoscopy.

¹⁻⁴Department of Obstetrics and Gynaecology, JSS Medical College, Mysuru, Karnataka, India

Corresponding Author: Madhuri N, Department of Obstetrics and Gynaecology, JSS Medical College, Mysuru, Karnataka, India, Phone: +91 99459073921, e-mail: madhurin@jssuni.edu.in

How to cite this article: Virupaksha A, Patil SR, Jayashree S, et al. Laparoscopic Management of Caesarean Scar Pregnancy: A Case Series. *World J Lap Surg* 2021;xx(x):xx-xx.

Source of support: Nil

Conflict of interest: None

CASE DESCRIPTION

For writing these reports, oral consent was obtained from the patients.

Case 1

- A 35-year-old G₃P₁L₁A₁ with a previous one C-section, presented to emergency department with complaints of intermittent bleeding per vagina and pain abdomen for one month. The previous C-section was done for fetal distress 10 years ago and an induced abortion at two months for which she underwent dilatation and curettage 2 years ago. The current pregnancy was detected by urine pregnancy test (UPT) at home after 2 months of amenorrhea.
- There was a history of over-the-counter medical termination of pregnancy (MTP) pills intake one month ago when UPT was positive and from then on, she had bleeding per vagina intermittently. She visited a local primary health care center (PHC) and was diagnosed as having incomplete abortion. Dilatation and curettage were attempted at the PHC, following which she bled profusely and was referred to higher center for further management.
- On examination, tachycardia and pallor were noted. Speculum examination revealed an open cervical opening in the cervix (OS) and minimal bleeding per vagina. On bimanual examination, cervix was bulky with an open OS, uterus anteverted and bilateral fornices were free and non-tender.

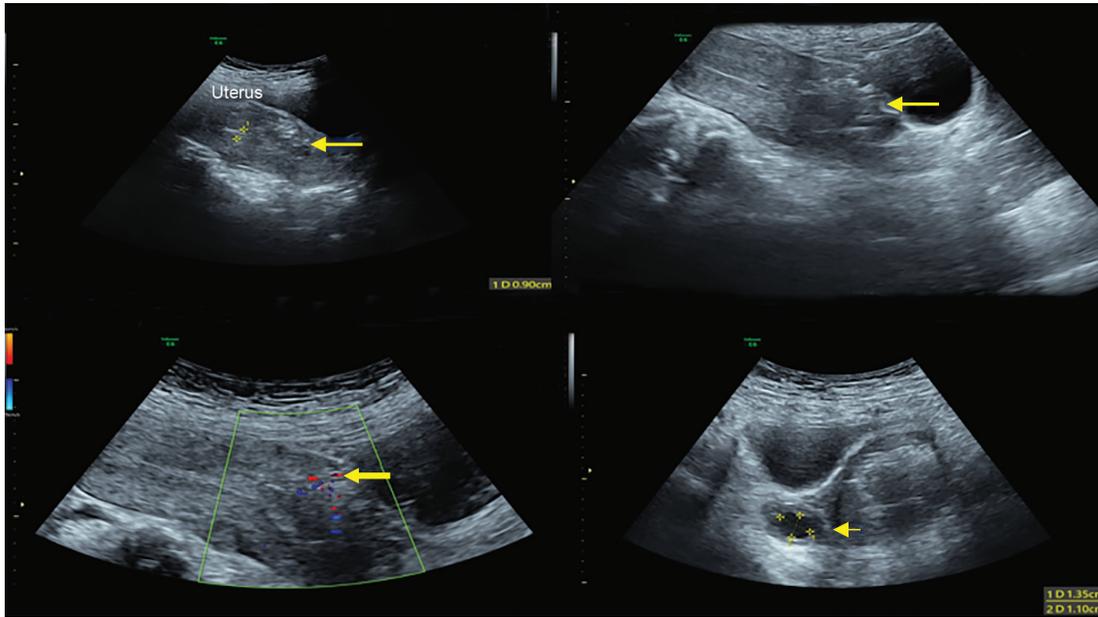


Fig. 1: TVS showing a hyperechoic lesion at the level of lower uterine segment

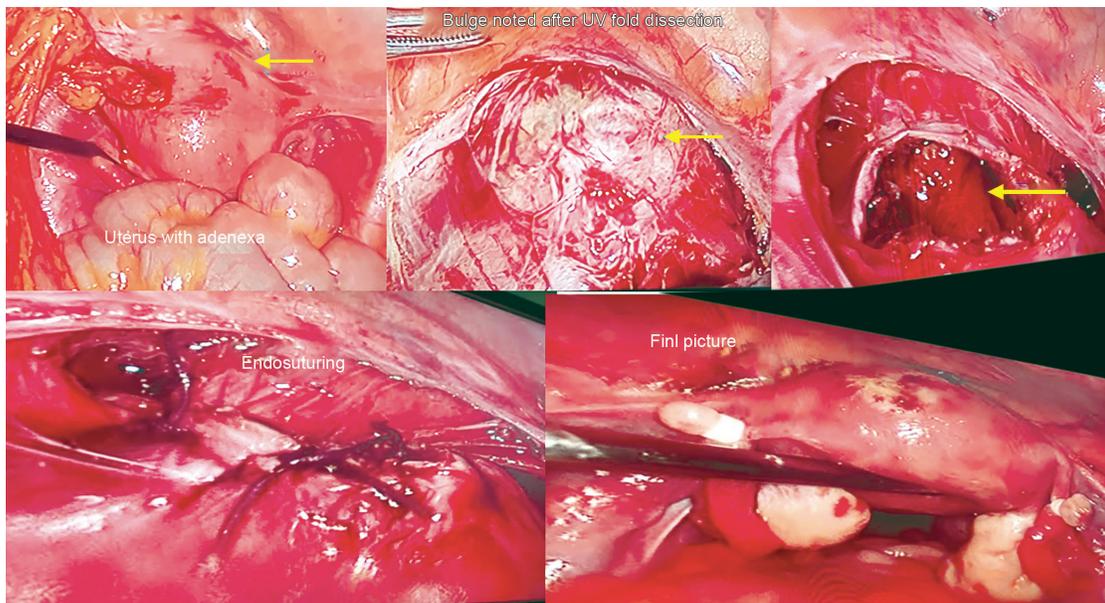


Fig. 2: Shows a bulge after dissecting UV fold of peritoneum

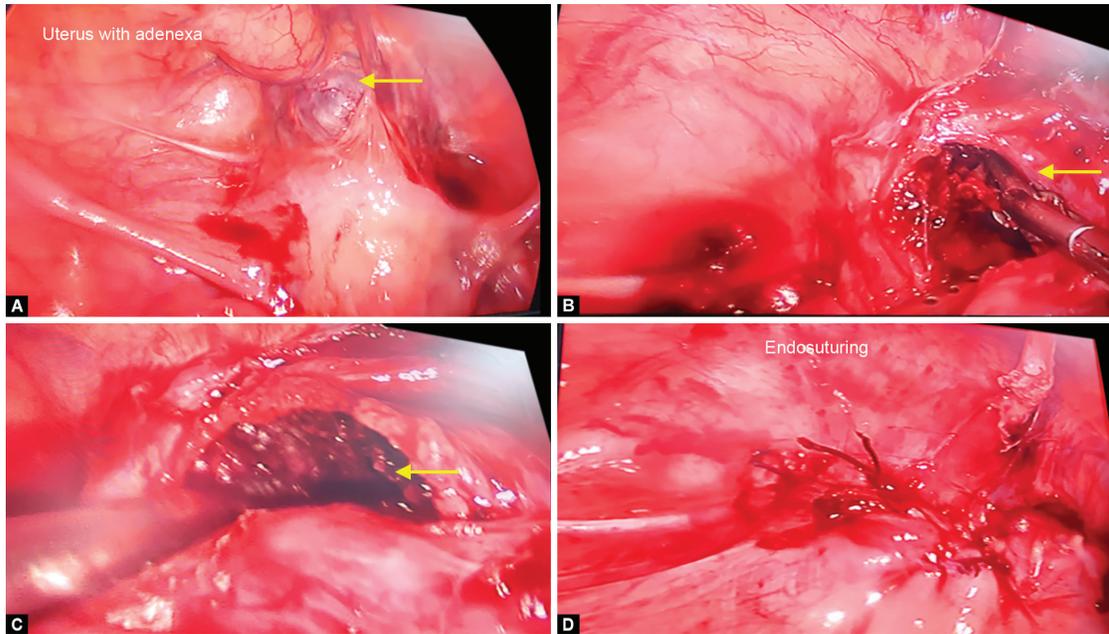
- Relevant investigations were done, beta human chorionic gonadotrophin (β -hCG) level was 3112 IU/L. Ultrasound examination showed a heteroechoic, predominantly hyperechoic lesion measuring 27 mm \times 13 mm in the anterior wall of lower uterine segment with posterior shadowing with increased internal vascularity and another hypoechoic cystic lesion measuring 15 mm \times 12 mm adjacent to it with no intrinsic vascularity. Doppler examination showed increased internal vascularity scar ectopic (Fig. 1).
- Diagnostic laparoscopy was performed and UV fold was dissected and a soft and vascular mass was noted. Saccular structure was noted on anterior wall and lower uterine segment of 4 cm \times 5 cm, incision was taken over the bulge, products

of conception were gently scooped out, scar was excised and endo-suturing was done. (Fig. 2) Products were sent for histopathological examination (HPE).

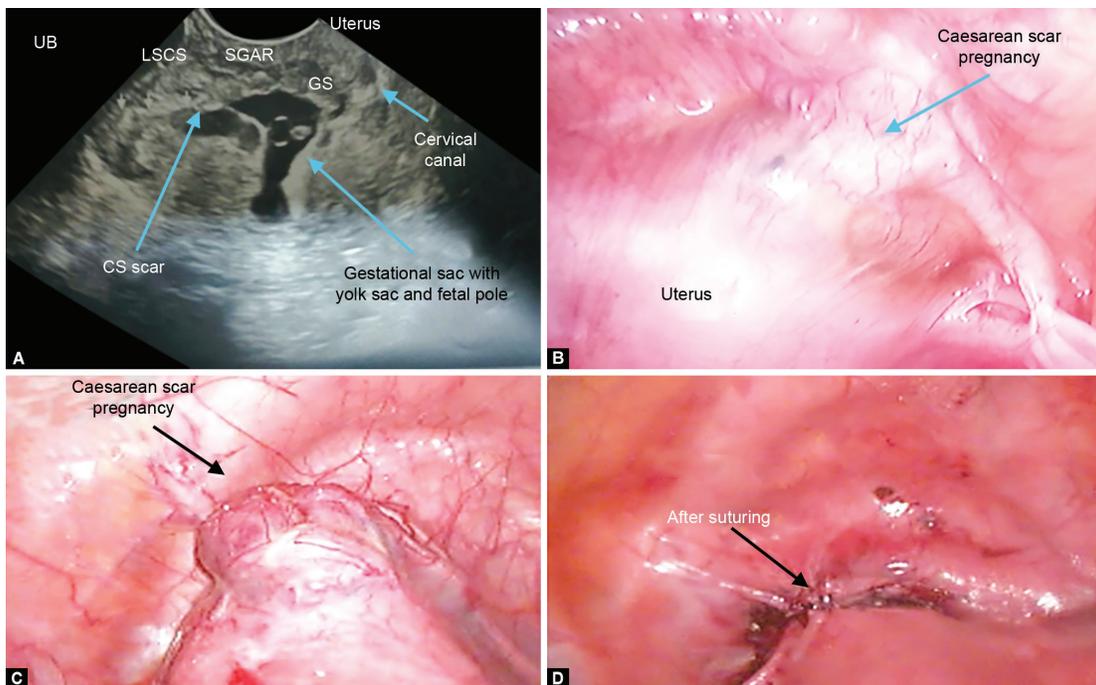
- Post-scar excision patient was followed up with repeat β -hCG on day 3 which was 224 IU/L, showing a declining trend. Histopathology revealed endometrial tissue with areas of hemorrhage and chorionic villi, thus confirming C-section scar ectopic pregnancy.

Case 2:

- A 35-year-old, G₃P₂L₂ with previous two C-sections came with history of 2.5 months of amenorrhea and a scan report of single



Figs 3A to D: Case 2: Intraoperative images illustrating scar ectopic and laparoscopic repair

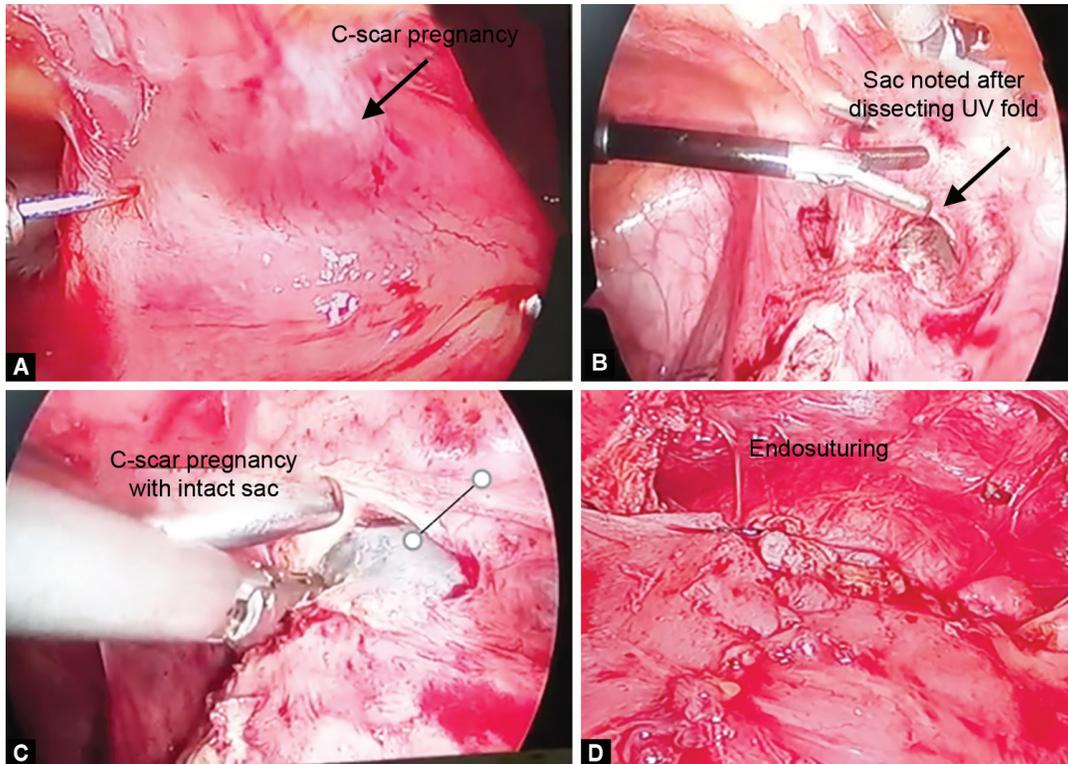


Figs 4A to D: Case 3: Ultrasound and intraoperative images depicting scar ectopic and laparoscopic repair

live intrauterine gestation with gestational age corresponding to 10 weeks 1 day. She had taken MTP pills 2 weeks ago following which she had vaginal bleeding for 3 days. She had childbirth previously 7 and 4 years ago by full term cesarean sections.

- On examination, the vitals were within normal limits. Abdomen was soft, non-tender. On speculum examination, closed cervical OS was noted. On bimanual examination, cervix was firm, uterus was anteverted and bilateral fornices were free and non-tender. Relevant investigations were done; hemoglobin was 9 gm/dL and β -hCG level was 15820 IU/L.

- Suction evacuation and laparoscopic tubal sterilization was planned. On suction, excessive vaginal bleeding around 250 mL was noted. Thus, uterine perforation or scar ectopic pregnancy was suspected and diagnostic laparoscopy was performed. A vascular mass of around 4 cm \times 5 cm was found at the site of the previous C-section scar on left side suggestive of scar ectopic and adnexa were normal (Fig. 3). Laparoscopic scar excision and suturing and bilateral tubal sterilization was also performed. Tissue was subjected to HPE and diagnosis of C-section scar ectopic pregnancy was confirmed. Repeat β -hCG level on post-operative day 3 was 821 IU/L.



Figs 5A to D: Case 4: Intraoperative images illustrating scar ectopic and laparoscopic repair

Case 3:

- A 28-year-old G₂P₁L₁ presented with history of bleeding per vagina for 10 days following 2 months amenorrhea. She had taken MTP pills 15 days ago without prior ultrasound.
- On examination, she was pale with pulse rate of 98/min and BP 100/70 mm Hg. There was tenderness in suprapubic region.
- Ultrasound showed features suggestive of CSP.
- On laparoscopy, a scar ectopic of 3 cm × 5 cm was noted. Dilute vasopressin (10U in 100 mL) was injected into the myometrium near the site of the ectopic. Uterovesical fold of peritoneum was opened, bladder was pushed down and the contents of ectopic pregnancy were aspirated after incising the overlying myometrium (Fig. 4). The rent was sutured with barbed suture. The HPE revealed products of conception.

Case 4:

- A 32-year-old G₂P₁L₁ presented with history of 2 months amenorrhea and no other complaints. She had previous lower segment caesarean section (LSCS) done 1 year back and came for MTP.
- Ultrasound showed a low placed gestational sac at the LSCS scar measuring 2.1 cm with fetal pole (CRL 3 mm corresponding to 5 weeks 6 days) and no cardiac activity. The myometrium over the serosal surface was thin and stretched out. The vitals were stable.

After discussing treatment options with her and taking informed consent for laparoscopic wedge excision of CSP, the procedure was carried out using intra-myometrial diluted vasopressin for minimizing blood loss (Fig. 5). The patient withstood the procedure well and HPE revealed products of conception.

DISCUSSION

Caesarean scar ectopic pregnancy occurs when the blastocyst implants on the previous C-section scar and there is invasion of the myometrium through a microtubular tract between the C-section scar and the endometrial canal.

Types and Pathology

Caesarean scar pregnancy are classified into two different kinds based on the implantation of the blastocyst and further progression of pregnancy by Vial et al.⁷ The first variety or type I CSPs also known as endogenous type, are the ones that may progress, leading to advanced gestation or even viable births as implantation in these pregnancies are occurring on the prior C-section scar with progression toward the cervico-isthmic space or even further to the uterine cavity. Life-threatening bleeding is a major complication associated with type I CSP. The second variety or the type II CSPs also known as exogenous type, are the alarming ones, as the implantation is deep into C-section scar defect and it develops deep invasion further progressing to the uterine serosa and the bladder with possible protrusion into the abdominal cavity. Type II CSPs are risky as they end up in uterine rupture, hemorrhage, shock and finally death.^{1,7} It is generally becoming accepted that CSP is a precursor of abnormally adherent placenta in the second and third trimester of pregnancy. Some authors have proposed that the term CSP should be used in the first trimester, early placenta accreta in the second and morbidly adherent placenta in the third trimester of pregnancy.⁸

The prior C-section delivery is a chief factor influencing the occurrence of CSP and literature defines it as a prerequisite for CSP development. However, the effect of number of previous C-sections and placenta previa on CSP is unstated. Interestingly,

certain C-section indications in previous pregnancies are identified as risk factors for CSP, the most common one being prior C-section for breech presentation.⁹

Clinical Features

Caesarean scar pregnancy may present from as early as 5–6 weeks to as late as 16 weeks. 39% of women with CSP present with painless vaginal bleeding though CSP is an incidental finding in (37%) asymptomatic woman. About 16% of women complain of accompanying mild to moderate pain and 9% complain of only abdominal pain. Profuse vaginal bleeding with severe acute pain or tender uterus on examination hints at an impending rupture. Hemodynamic instability and/or collapse strongly implies a ruptured CSP. Clinical examination in stable women is usually unremarkable.⁵

Diagnosis

The ultrasound diagnosis of CSP should be made when the pregnancy invades myometrium in the vicinity of the internal OS. Caesarean scar pregnancies are implanted anteriorly at the visible or presumed site of transverse lower segment uterine scar. Internal OS is identified using Doppler and identifying the uterine vessels.¹⁰

Sensitivity of 86.4% has been estimated with combined TVUS and color Doppler.¹¹ The differential diagnoses include cervical ectopic pregnancy, cervico-isthmic pregnancy and inevitable abortion. MRI aids in diagnosis when ultrasound diagnosis is equivocal and patient is hemodynamically stable. Sagittal T2-weighted images may help in identifying placental implantation, bladder wall invasion and thickness of myometrium which may give us an idea of risk of rupture.¹² There are insufficient data to support a benefit of routine use of 3D ultrasound imaging for the diagnosis or management of CSP.⁹

Prognosis

Caesarean scar pregnancy is typically terminated upon confirmation of diagnosis to avoid life-threatening complications. However, a survey of 36 cases of CSP that continued under expectant management showed that, hysterectomy was performed in the second trimester in 10 cases due to genital bleeding, live offspring were delivered in 26 cases, at 26–39 weeks of gestation and hysterectomy was performed at delivery in 17 cases (only in type 1).¹³

Complications

The chorionic villi are either bound to or penetrate the myometrium in CSP unlike in case of placenta accreta where the villi invade the myometrium. This is said to be the reason for life threatening complications associated with CSP.⁵

Treatment

The Royal College of Obstetricians and Gynecology London (RCOG)/ AEPG Green-top Guideline (No. 13) has highlighted that there is need for research on optimal treatment of CSP as there is no consensus on this. The three reported options include expectant, medical, and surgical management.⁸ Duration of pregnancy, maternal vital parameters, desire to preserve fertility, skill and experience of the treating physician, and the resources available determine the treatment option to be chosen. The primary goal of treatment should be to preserve maternal health preserving fertility, the secondary goal.⁹

Expectant management is no more recommended as it may lead to severe maternal morbidity.^{9,14} If the patient opts for expectant treatment, it may be considered if there is no cardiac activity. Also, the

patient should be informed of the possibility of losing the pregnancy as well as hysterectomy in the event of excessive bleeding.¹⁵

The options for medical management of CSPs include the following:

- (a) Systemic injection of methotrexate (MTX).
- (b) Local injection of MTX and/or potassium chloride/ ethanol/ hyperosmolar glucose into the gestational sac.
- (c) Oral mifepristone (not commonly practiced).

Hemodynamically stable patients may be offered medical management with success rates ranging between 56% and 77%. The combination of systemic and local therapy has been reported to be associated with highest success rate. The reported complications include hemorrhage (7%) and hysterectomy (3).^{14,16} The risk of complications in subsequent pregnancies due to unrepaired C-section scar defect is considered as the disadvantage of medical treatment alone over surgical treatment.

Options for surgical treatment include the following:

- (a) Dilatation and curettage (D&C) (success rate of 76%).
- (b) Hysteroscopic/laparoscopic/vaginal/open excision of CSP (success rates: 88, 96, 97, and 99%, respectively).
- (c) Hysterectomy.

The highest complication rate was noted with D&C; the risk of hemorrhage being 28%, and hysterectomy, 3%. With excision of CSP, the complication rate was much lower; risk of hemorrhage being 4% and the risk of hysterectomy, 2%.¹⁶

The combined medical and surgical treatment options have also been tried and have been found to be associated with higher success rates and lower complication rates. A systemic MTX may be given followed 7 days later by hysteroscopic resection or laparoscopic excision (success rate, 87%; risk of hemorrhage, 5%; and risk of hysterectomy, 0%). If there is no disappearance of blood flow around the scar on Doppler or insignificant decline in hCG, it may be prudent to give a repeat dose of MTX before surgical treatment. However, the combination of suction curettage with medical treatment does not seem to be of much benefit.^{14,16}

In surgical excision of scar ectopic, wedge resection of the uterine wall is done followed by repair of the incision. This may be done with/without bilateral uterine artery occlusion. Laparoscopic approach seems to have the advantage of complete removal of the products of conception thereby reducing the follow up time. Another advantage with laparoscopic technique is excellent view of the pathology facilitating complete reconstruction and good prognosis for future pregnancies.¹⁷ Hysteroscopy could be considered as a primary treatment modality for type I CSP.¹⁴

The uterine artery embolization (UAE) is another treatment option reported, being undertaken before D&C or surgical therapy and sometimes in combination with medical therapy.¹⁶ Although reported to increase the success rate of the primary treatment, UAE has its disadvantages, namely, diminished ovarian reserve, fetal growth restriction, preterm delivery, abruption placentae, and placenta accreta.¹⁴

The high-intensity focused ultrasound ablation has also been reported either alone or combined with D&C in CSPs of less than 8–9 weeks in a few cases (success rate, 93%; risk of hemorrhage, 4; and risk of hysterectomy, 0%).¹⁶ There is insufficient data comparing success rate with MTX vs UAE prior to surgical treatment in CSP. However, the blood loss was found to be lower with systemic MTX group.¹⁸

Future Pregnancy Prospects

Caesarean scar pregnancy is associated with long-term risks which include secondary infertility, recurrence of ectopic pregnancy, uterine rupture and placental attachment abnormalities resulting in maternal/fetal morbidity/mortality. These issues should be discussed while counselling patients who desire fertility.^{4,9,12}

Caesarean scar pregnancy is an upshot of C-section, a primary caesarean scar invariably invites repeat scars and possibly more CSP. Therefore, as a preventive measure it would be prudent to monitor a primary labor well and perform a justified C-section.⁶ As the rate of C-section scar ectopic pregnancies are increasing every obstetrician is very likely to come across this entity in their lifetime. Hence, in women with history of the previous C-section, early transvaginal ultrasound needs to be done to look for location of implantation and early diagnosis and early initiation of treatment.

The surgical and combination treatments are very effective, whereas medical therapy is associated with a higher risk of failure, with hemorrhage and persistence of trophoblast being the commonest issues that need to be considered in the post-treatment phase.

ORCID

Soumya Rajshekar Patil  <https://orcid.org/0000-0001-8092-8703>

REFERENCES

1. Younes G, Goldberg Y, Lavie O, et al. Caesarean scar pregnancy: a case series of diagnosis, treatment, and results. *J Diagn Med Sonography* 2018;34(6):502–508. DOI: 10.1177/8756479318791155.
2. Zhou XY, Li H, Fu XD. Identifying possible risk factors for caesarean scar pregnancy based on a retrospective study of 291 cases. *J Obstet Gynaecol Res* 2024;46(23):272–278. DOI: 10.1111/jog.14163.
3. Pędraszewski P, Właźlak E, Panek W, et al. Caesarean scar pregnancy: a new challenge for obstetricians. *J Ultrason* 2018;18(72):56–62. DOI: 10.15557/JoU.2018.0009.
4. Al Gadeeb S, Al Gadeeb M, Al Matrouk J, et al. Caesarean scar: unusual site of ectopic pregnancy: a case report. *Cureus* 2019;11(10):e5970. DOI: 10.7759/cureus.5970.
5. Ash A, Smith A, Maxwell D. Caesarean scar pregnancy. *BJOG* 2007;114(3):253–263. DOI: 10.1111/j.1471-0528.2006.01237.x.
6. Hegde CV. Caesarean scar pregnancy: some management options. *J Obstet Gynecol India* 2017;67(3):153–156. DOI: 10.1007/s13224-017-0987-2.
7. Vial Y, Petignat P, Hohlfeld P. Pregnancy in a caesarean scar. *Ultrasound Obstet Gynecol* 2000;16(6):592–593. DOI: 10.1046/j.1469-0705.2000.00300-2.x.
8. Harb HM, Knight M, Bottomley C, et al. Caesarean scar pregnancy in the UK: a national cohort study. *BJOG* 2018;125(13):1663–1670. DOI: 10.1111/1471-0528.15255.
9. Miller R, Timor-Tritsch IE, Gyamfi-Bannerman C. Society for maternal-fetal medicine (SMFM) Consult Series #49: Caesarean scar pregnancy. *Am J Obstet Gynecol* 2020;222(5):B2–B14. DOI: 10.1016/j.ajog.2020.01.030.
10. Kirk E, Ankum P, Jakab A, et al. Terminology for describing normally sited and ectopic pregnancies on ultrasound: ESHRE recommendations for good practice. *Hum Reprod Open* 2020;2020(4):hoaa055. DOI: 10.1093/hropen/hoaa055.
11. Deans R, Abbott J. Hysteroscopic management of caesarean scar ectopic pregnancy. *Fertility and Sterility* 2010;93(6):1735–1740. DOI: 10.1016/j.fertnstert.2008.12.099.
12. Brancazio S, Saramago I, Goodnight W, et al. Caesarean scar ectopic pregnancy: case report. *Radiol Case Rep* 2019;14(3):354–359. DOI: 10.1016/j.radcr.2018.12.001.
13. Tamada S, Masuyama H, Maki J, et al. Successful pregnancy located in a uterine caesarean scar: a case report. *Case Rep Womens Health* 2017;14:8–10. DOI: 10.1016/j.crwh.2017.03.003.
14. Gonzalez N, Tulandi T. Caesarean scar pregnancy: a systematic review. *J Minim Invasive Gynecol* 2017;24(5):731–738. DOI: 10.1016/j.jmig.2017.02.020.
15. Jayaram P, Okunoye G, Al Ibrahim AA, et al. Expectant management of caesarean scar ectopic pregnancy: a systematic review. *Journal of Perinatal Medicine* 2017;46(4):365–372. DOI: 10.1515/jpm-2017-0189.
16. Maheux-Lacroix S, Li F, Bujold E, et al. Caesarean scar pregnancies: a systematic review of treatment options. *J Minim Invasive Gynecol* 2017;24(6):915–925. DOI: 10.1016/j.jmig.2017.05.019.
17. Fuchs N, Manoucheri E, Verbaan M, et al. Laparoscopic management of extrauterine pregnancy in caesarean section scar: description of a surgical technique and review of the literature. *BJOG* 2014;122(1):137–140. DOI: 10.1111/1471-0528.13060.
18. Long Y, Zhu H, Hu Y, et al. Interventions for non-tubal ectopic pregnancy. *Cochrane Database Syst Rev* 2020;7(7):CD011174. DOI: 10.1002/14651858.CD011174.pub2.