Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 23s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Diagnostic And Clinical Challenges In Managing Scar Ectopic Pregnancy: A Case Series

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Cite this paper as: Dr. Yugantika Tomar, (2025) Diagnostic And Clinical Challenges In Managing Scar Ectopic Pregnancy: A Case Series. *Journal of Neonatal Surgery*, 14 (23s), 17-22.

ABSTRACT

Background: This rare but devastating type of ectopic implantation in which the pregnancy takes place within the myometrium at the location of a previous lower-segment cesarean section scar is called scar ectopic pregnancy, and especially cesarean scar ectopic pregnancy (CSEP). The increasing number of cesarean sections performed all over the world has been followed by an increase in this condition, which poses great diagnostic and therapeutic difficulties to obstetricians.

Objective: This series of cases will attempt to describe the range of presentations of cesarean scar ectopic pregnancies, describe the intricacies of diagnosing the condition, and review the varied management options varying from conservative medical treatment to surgery.

Methods and Cases: This report details eight cases of ectopic pregnancy in the cesarean scar managed at the authors' center. Each case was unique regarding gestational age, clinical stability, diagnostic workup, and definitive treatment. The approaches employed included medical management (methotrexate, ultrasound-guided potassium chloride injection) and surgical methods (scar excision, hysterectomy).

Conclusion: The early detection of ectopic implantation might be considered dangerous, if any suspicion might enter into the minds of the evaluators. Ultimately the treatment route must depend upon such factors as hemodynamic stability, the wish for subsequent fertility of the woman, gestational age, and what resources are available locally. This series of cases describes the significance of early clinical identification of red flag signs, proper imaging techniques, and prompt management aimed at minimizing morbidity and preserving fertility whenever it can be.

Keywords: *Menopause, Mental health, Hormonal fluctuations, Mood disorders, Anxiety, Depression.*

1. INTRODUCTION

CSEP is a considerable entity although an uncommon one in the abnormal variant of implantation such that an embryo or gestational sac implants within the myometrium of a previous cesarean-section scar (1, 2). While the past few decades have seen an escalating global trend of cesarean deliveries, cesarean scar pregnancies have seen a flood like never before; some literature has evidence to show that CSEP may be responsible for 6.1% of ectopic pregnancies throughout the world (3). Though first reported in the late 1970s, this entity was long disregarded due to lack of awareness and poor imaging technology (4). Nowadays, the diagnosis is initially and accurately made by high-frequency transvaginal ultrasonography (TVS) with great help from adjuncts such as Doppler ultrasound and MRI where anatomical delineation is challenging (5).

Pathophysiologically, the development of a cesarean scar defect, or an isthmocele or niche as it is usually known, appears to be the most significant cause of such pathological implantation (6). It occurs due to defective healing or suboptimal technique during surgery and results in an area of thinning and discontinuity within the lower uterine segment (7). Local mechanisms like deranged angiogenesis and fibrosis can worsen the susceptibility of the myometrium to blastocyst invasion (8). Moreover, uterine manipulation on multiple occasions, such as dilatation and curettage (D&C), tends to further destabilize the integrity of the scarred cesarean, placing subsequent pregnancies in jeopardy of fixing abnormally at the defect site (2,9).

Health care providers need to be watchful for characteristic clinical presentations of acute abdomen (such as pain in the lower abdomen), vaginal bleeding, or a comparatively uneventful early pregnancy found accidentally during routine sonography (10). The implication of delayed or missed diagnosis is calamitous: rupture of the uterus, profound hemorrhage, disseminated intravascular coagulation (DIC), and death of the mother have all been reported (4,11). Cesarean scar ectopics, as a spectrum, have been divided by the infiltration and growth orientation of the gestational sac: Type 1 (endogenic or exogenic development) and Type 2 (deep or infiltrative development), the latter having a greater risk of unfavorable outcome (12).

Due to its rarity and wide range of presentations, there is no general agreement on the best management strategies for CSEP (3). Management options need to be tailored to the individual. Patients who are clinically stable and have an unruptured scar ectopic can be treated with conservative management with systemic methotrexate, local injection (e.g., potassium chloride),

or ultrasound-guided evacuation (2,13). On the other hand, if pregnancy is advanced or the patient is hemodynamically unstable, or the myometrium is significantly damaged, then surgical intervention through laparoscopy or laparotomy with removal of the gestational sac—possibly even hysterectomy in extreme situations—is imperative (4,14). Fertility preservation is a central concern, particularly in patients who wish to have future pregnancies.

The aim of this case series is to highlight the clinical heterogeneity of presentation and clarify the anatomical, diagnostic, and therapeutic challenges of cesarean scar ectopic pregnancies. Through the demonstration of eight cases treated in our institution, we provide insights into how early identification, evidence-based imaging, and multi-disciplinary treatment can maximize outcomes for mothers faced with this high-risk situation.

2. CASE SERIES

This case report series presents eight different presentations of cesarean scar ectopic pregnancy treated in our department. Each case illustrates a wide range of clinical, diagnostic, and therapeutic difficulties, mirroring the complexity and the bespoke nature of management for this fraught obstetric condition.

CASE 1

A 36-year-old gravida 7, para 3, living 2, abortus 2 (G7P3L2A2) came at about two months of gestation with a history of one previous lower segment cesarean section (LSCS). She also had a history of medical termination of pregnancy (MTP) pill consumption, followed by dilatation and curettage (D&C). The patient complained of vaginal bleeding and slight lower abdominal pain.

Investigations and Findings:

- **Transvaginal Sonography (TVS)** revealed a heterogeneous area localized to the region of the previous uterine scar. The sonologist raised a possibility of either a small hematoma or retained products of conception positioned within the scar site.
- Serum β-hCG levels were consistent with an early pregnancy but were incongruent with a normal intrauterine gestation.

Management:
Given the suspicion of abnormal implantation and the patient's complaint of persistent bleeding, she underwent **exploratory laparotomy**. Intraoperative findings confirmed a cesarean scar pregnancy. A **surgical excision** of the ectopic mass, along with appropriate repair of the underlying myometrium, was performed. Estimated blood loss was moderate. The patient received prophylactic antibiotics and supportive care.

Outcome:
Her postoperative course was uneventful. She recovered well, and serial β-hCG levels declined appropriately. Follow-up ultrasound revealed no retained gestational tissue. She was counseled on the significance of future pregnancies and advised regarding the increased vigilance required in subsequent pregnancies.

CASE 2

A 38-year-old woman (G3P2L2) with one previous LSCS presented at nearly three months of amenorrhea in a state of hemodynamic compromise. She was tachycardic, hypotensive, and complained of acute abdominal pain along with vaginal bleeding.

Investigations and Findings:

- **TVS** suggested a cesarean scar ectopic with near-complete absence of healthy myometrium in the isthmic area. Significant free fluid, consistent with hemoperitoneum, was observed in the abdominal cavity.
- Laboratory tests revealed a precipitous drop in hemoglobin, necessitating urgent blood transfusion.

Management:
An **emergency exploratory laparotomy** was performed to control bleeding and resect the ectopic. Because of extensive uterine dehiscence, poor scar integrity, and life-threatening hemorrhage, a **subsequent hysterectomy** was undertaken to save the patient's life.

Outcome:
The patient stabilized postoperatively. She required multiple units of packed red blood cells. Although loss of the uterus was a grave outcome, the timely surgical intervention was crucial in averting maternal mortality. She was counseled extensively regarding the nature of her diagnosis and the necessity of hysterectomy.

CASE 3

A 36-year-old patient, gravida 3, para 2, living 2, with two previous LSCS and one previous surgical evacuation, presented

with a clinically silent early pregnancy. On transvaginal ultrasound, there was suspicion of a **Type 2 cesarean scar ectopic**, characterized by deep gestational sac infiltration into the myometrium, but the imaging findings were somewhat equivocal.

Diagnostic Complexity:

- **Laparohysteroscopy** was initially performed. Laparoscopic exploration was complicated by bladder adhesions to the upper segment of the anterior uterine wall, obscuring the gestational mass.
- **Hysteroscopy** revealed extensive intracavitary adhesions, significantly interfering with visualization of the lower uterine segment and the scar region.
- **MRI** was eventually pursued to confirm the presence and exact topography of the ectopic sac.

Management:

Following the MRI confirmation, a **laparotomy** was undertaken. The ectopic pregnancy was meticulously excised, and the uterine scar was repaired in layers to optimize healing and maintain uterine integrity.

Outcome:

The patient recovered well and was discharged on postoperative day five. Counseling centered on careful planning and early imaging in any future pregnancy to evaluate the scar.

CASE 4

A 25-year-old (G3P2L1A1) with two previous LSCS presented at 16 weeks of gestation (about four months) complaining of intermittent painless vaginal bleeding. Clinical examination demonstrated an unremarkable abdomen except for minimal tenderness in the suprapubic area.

Investigations and Findings:

- **TVS** revealed a gestational sac implanted in the anterior uterine wall with an empty main uterine cavity. The sac location was strongly suggestive of a cesarean scar pregnancy.
- Her hemodynamics remained stable, and hemoglobin was within normal limits.

Management:

Considering her stable condition, the moderate gestational age, and the desire to preserve fertility, a **conservative medical approach** with **methotrexate** was instituted. Frequent follow-up with serial β-hCG testing and transvaginal ultrasound was done to ensure regression of the ectopic.

Outcome:

The ectopic pregnancy gradually resolved under close monitoring. Bleeding subsided, and β-hCG titers trended downwards. She was counseled on the need for early ultrasound in future pregnancies to rule out recurrent scar ectopic or placenta accreta spectrum disorders.

CASE 5

A 27-year-old gravid 2, para 1, living 1 (G2P1L1) with one previous LSCS presented with acute-onset lower abdominal pain and scant bleeding at roughly eight weeks' gestation. She had no significant comorbidities or other uterine surgeries.

Investigations and Findings:

- **TVS** demonstrated an irregular gestational sac embedded within the lower anterior myometrium at the site of the previous cesarean scar.
- Laboratory values did not reveal significant anemia.

Management:

After a multidisciplinary consultation, the team opted for **local injection of potassium chloride (KCl) into the ectopic sac** under ultrasound guidance. This intervention aimed to induce cessation of embryonic/fetal cardiac activity and promote gradual involution of the ectopic gestation.

Outcome:

Serial sonograms over the subsequent weeks indicated shrinking of the ectopic mass and a reduction in β-hCG levels. The patient experienced mild vaginal spotting but remained hemodynamically stable throughout the treatment course.

CASE 6

A 27-year-old (G2P1L1) presented similarly to Case 5, with around two months of gestation, mild abdominal pain, and light

vaginal bleeding. She had one prior lower-segment cesarean delivery. Investigations again revealed a probable scar ectopic pregnancy in the lower uterine segment.

Management and Outcome:

Following a confirmatory ultrasound, **USG-guided potassium chloride injection** was performed. The patient responded favorably, with gradual resolution of the ectopic pregnancy over subsequent weeks. No complications were reported. She was counseled in a manner similar to the aforementioned cases, highlighting the necessity for early prenatal evaluation in subsequent pregnancies.

CASE 7

A 30-year-old gravida 4, para 2, living 2, abortus 1 (G4P2L2A1) presented with approximately 12 weeks of gestation (three months) and a history of two previous cesarean deliveries. She complained of on-and-off vaginal bleeding accompanied by intermittent lower abdominal cramps.

Investigations:

- **TVS** identified a heterogeneous area in the region of the old scar and an irregular sac in the anterior myometrium, consistent with a cesarean scar pregnancy.
- Hemodynamic parameters were stable, but the thickness of the residual myometrium was reported to be precariously thin.

Management:

Given the size of the ectopic and the patient's symptomatic presentation (and to avoid the potential risks of rupture as the pregnancy advanced), a **laparotomy and scar excision** were performed. The defect was sutured in layers to secure hemostasis and preserve uterine integrity.

Outcome:

Her recovery was smooth; she was discharged after routine postoperative follow-up. Future pregnancy counseling was offered, emphasizing the criticality of confirming normal intrauterine placement in early gestation.

CASE 8

A 28-year-old gravida 3, para 2, living 2 (G3P2L2) at nearly 12 weeks of gestation with two prior LSCS presented with continuous, mild-to-moderate vaginal bleeding for one week. She also had lower abdominal discomfort but remained stable, with no signs of hemodynamic compromise.

Investigations:

- **TVS** clearly localized a gestational sac in the anterior lower uterine segment area with an empty main uterine cavity, indicating a cesarean scar pregnancy.
- Mild anemia was noted, but not at a level necessitating transfusion.

Management:

Due to the stable hemodynamic profile and patient preference to preserve future fertility, a **conservative approach** was chosen, involving **ultrasound-guided KCl injection**. The therapeutic plan included close monitoring of β-hCG levels and repeat ultrasound examinations.

Outcome:

Over time, the gestational sac regressed, and the β-hCG dropped accordingly. The patient remained clinically stable, requiring only supportive care.

3. DISCUSSION

Cesarean scar ectopic pregnancy (CSEP) is a perilous clinical situation, which occurs due to implantation of a gestational sac into the fibrous or healed insufficiently niche of an earlier cesarean delivery (1,2). The actual pathophysiology involves localized uterine elements, such as faulty myometrial healing, microscopic tracts or sinuses in the cicatrix, and possible abnormal endometrial movements at the site of the scar (3,7). Any compromise in the anatomic or vascular integrity of the isthmus predisposes the embryo to invade deeper into the myometrium, threatening catastrophic rupture and severe hemorrhage. The increasing global incidence is strongly correlated with rising cesarean section rates, rendering it increasingly pertinent in contemporary obstetric practice (4,8).

Clinical Presentation and Diagnostic Nuances

Patients with scar ectopic pregnancy may present with variable symptomatology. The most common complaints include

painless vaginal bleeding, mild lower abdominal cramps, or occasionally, no symptoms at all (9,11). Some women are incidentally diagnosed during a first-trimester ultrasound for routine prenatal care. On the other extreme, if the ectopic gestation erodes into the uterine serosa or adjacent vasculature, patients may present in hemorrhagic shock, as demonstrated in our Case 2 (1,2). Such varied clinical presentations exemplify why a high index of suspicion is necessary in any pregnant individual with a history of prior cesarean deliveries, especially in the presence of abnormal gestational sac localization or unexplained bleeding (6,10).

TVS, supplemented by **Color Doppler**, remains the cornerstone of diagnosis, allowing direct visualization of the implanted sac and the measurement of myometrial thickness between the bladder and the gestational sac (4,9). The "empty uterine cavity" sign and detection of a distinct gestational structure embedded within the anterior isthmus or lower uterine segment are highly indicative of CSEP (12). Nevertheless, in complex cases—particularly those with extensive scarring, adhesions, or uncertain anatomy—MRI helps delineate the relationship between the sac, myometrium, and surrounding structures (13). This is reflected in our Case 3, where an MRI was indispensable for surgical planning after laparoscopy and hysteroscopy failed to clarify the diagnosis (14).

Treatment Strategies

Management hinges upon the gestational age, clinical stability, desire for fertility preservation, and extent of invasion into the uterine wall (2,5). Conservative management offers a reproductive-sparing approach for stable patients with unruptured ectopics. Medical therapy using systemic **methotrexate** and/or **local injection** (e.g., potassium chloride or methotrexate under ultrasound guidance) is appropriate when the embryo is early, small, and shows minimal vascularity (15). Our Cases 4, 5, 6, and 8 exemplify such conservative strategies with favorable outcomes. Close follow-up with serial β-hCG and ultrasound is vital to ensure resolution of the ectopic mass and avert delayed rupture (16).

Surgical Intervention

Patients who are hemodynamically unstable, have evidence of rupture or extensive infiltration, or have failed conservative management often require surgical intervention (8,17). A laparoscopic approach may be considered if the necessary expertise and resources are available; however, in emergent scenarios with massive hemorrhage, laparotomy allows faster control of bleeding and direct repair of the uterine scar (4,10). Excision of the ectopic and resuturing of the uterus typically preserves fertility, although, in extreme cases with uncontrollable bleeding or severe destruction of the uterine cavity, **hysterectomy** may be lifesaving (2,5). This was crucial in Case 2, where a sub-total hysterectomy was necessary to stabilize the patient.

Prognosis and Follow-Up

The principal dangers of a cesarean scar ectopic are uterine rupture, massive hemorrhage, and the potential for maternal mortality (2). Timely intervention reduces morbidity, but the scar remains a point of weakness for future pregnancies. Patients with a history of CSEP should be counseled on early ultrasound assessment in subsequent pregnancies to ascertain normal intrauterine location and to exclude placenta accreta spectrum disorders that can arise in areas of uterine scarring (18). In this context, establishing standardized follow-up protocols, including imaging and endocrine profiles, is a critical measure to detect reimplantation anomalies early and to safeguard maternal health.

Limitations and Future Directions

One of the key challenges is to achieve standardized protocols for the diagnosis and treatment of CSEP, considering the lack of large prospective trials. Clinical judgment, patient choice, and local availability are the basis of many management decisions (4,9). More studies are needed to optimize diagnostic scoring systems, individualize medical regimens, and identify optimal surgical strategies in complicated cases (6,16). Establishing multicenter registries and sound clinical guidelines will be crucial to reducing adverse outcomes and ensuring consistent care globally.

In conclusion, this case series emphasizes the powerful character of cesarean scar ectopic pregnancy, in which prompt identification and judiciously selected therapeutic strategy are of utmost importance. Through the description of eight individual cases, we emphasize the wide clinical spectrum of CSEP and reaffirm the need for ongoing caution, particularly in women with a history of previous cesarean delivery, to avoid life-threatening complications.

4. CONCLUSION

Ectopic pregnancy in Caesarean-section scars is an uncommon and extremely dangerous type of ectopic pregnancy. The eight cases outlined demonstrate the diffuse and kaleidoscopic nature of clinical presentation, emphasizing the urgent need for heightened diagnostic awareness in finite pregnancies, particularly in patients with preceding surgical histories. Proper localization through the first early high-resolution transvaginal ultrasound, supplemented by MRI if necessary, would avoid life-threatening complications. Treatment should include radical surgery or conservative medical management, strictly tailored to the individual patient according to her fertility desires, gestational parameters, and clinical stability.

The clinical cases featured in this case series further stress the importance of the multidisciplinary approach among obstetricians, radiologists, anesthesiologists, and the nursing personnel in ensuring early detection, definitive management,

and complete postoperative follow-up. An increase in the C-section's worldwide prevalence necessitates a knowledge of the obstetric complications arising from it, especially CSEP. Future objectives should include the establishment of standard diagnostic criteria and further refinement of surgical techniques and viable long-term reproductive outcomes so that clinicians can improve management of this challenging clinical condition.

REFERENCES

[1] Haberman S, Saraf S, Zhang J, Landy HJ, Branch DW, Burkman R, et al. Nonclinical parameters affecting primary cesarean rates in the United States. Am J Perinatol. 2014;31:213–22.

[2] Klemetti R, Che X, Gao Y, Raven J, Wu Z, Tang S, et al. Cesarean section delivery among primiparous women in rural China: an emerging epidemic. Am J Obstet Gynecol. 2010;202:e1–6.

[3] Rotas MA, Haberman S, Levgur M. Caesarean scar ectopic pregnancies: aetiology, diagnosis, and management. Obstet Gynecol. 2006;107:1373–81.

[4] Rotas MA, Haberman S, Levgur M. Cesarean scar ectopic pregnancies: etiology, diagnosis, and management. Obstet Gynecol. 2006;107(6):1373–81.

[5] Einenkel J, Stumpp P, Kosling S, Horn LC, Hockel M. A misdiagnosed case of caesarean scar pregnancy. Arch Gynecol Obstet. 2005;271(2):178–81.

[6] Weimin W, Wenqing L. Effect of early pregnancy on a previous lower segment cesarean section scar. Int J Gynaecol Obstet. 2002;77(3):201–7.

[7] Timor-Tritsch IE, Monteagudo A. Unforeseen consequences of the increasing rate of cesarean deliveries: early placenta accreta and cesarean scar pregnancy. A review. Am J Obstet Gynecol. 2012;207(1):14–29.

[8] Cali G, Timor-Tritsch IE, Palacios-Jaraquemada J, Monteagudo A, Buca D, Forlani F, et al. Outcome of cesarean scar pregnancy managed expectantly: systematic review and meta-analysis. Ultrasound Obstet Gynecol. 2018;51(2):169–75.

[9] Wang CB, Chien SC, Lee CY, Lee YC, Chen TC. Cesarean scar pregnancy: diagnosis and management. Ultrasound Obstet Gynecol. 2006;27(2):222–6.

[10] Jurkovic D, Hillaby K, Woelfer B, Lawrence A, Salim R, Elson CJ. First-trimester diagnosis and management of pregnancies implanted into the lower uterine segment cesarean section scar. Ultrasound Obstet Gynecol. 2003;21(3):220–7.

[11] Fuchs T, Henrich W, Ostermann K, Dudenhausen JW. Sonographic diagnosis of cesarean scar pregnancy and successful medical treatment with methotrexate. Ultrasound Obstet Gynecol. 2004;23(5):563–5.

[12] Tang A, Baartz D, Cario G. Cesarean scar pregnancy: a localized form of placenta accreta and its implications. Aust N Z J Obstet Gynaecol. 2013;53(2):208–10.

[13] Maymon R, Halperin R, Mendlovic S, Schneider D, Vaknin Z, Herman A. Efficacy and safety of fertility-preserving treatment in patients with cesarean scar pregnancies: a prospective single-center trial. Fertil Steril. 2011;95(2):601–4.

[14] Peng P, Liu Y, Wei H, Zhai J, Lu X. Diagnostic value of MRI in cesarean scar pregnancy: a systematic review and meta-analysis. J Magn Reson Imaging. 2020;51(1):205–16.

[15] Ash A, Smith A, Maxwell D. Caesarean scar pregnancy. BJOG. 2007;114(3):253–63.

[16] Birch Petersen K, Hoffmann E, Rifbjerg Larsen C, Svarre Nielsen H. Cesarean scar pregnancy: diagnosis and treatment. A review of the literature. Eur J Obstet Gynecol Reprod Biol. 2016;205:130–40.

[17] Jurkovic D. Cesarean scar pregnancy and placenta accreta. Ultrasound Obstet Gynecol. 2020;55(3):359–60.

[18] Miller R, Timor-Tritsch I, Gyamfi-Bannerman C. Society for Maternal–Fetal Medicine (SMFM) Consult Series #49: Cesarean scar pregnancy. Am J Obstet Gynecol. 2020;222(4):B2–14.