



Ectopic Pregnancy Implanted in A Cesarean Scar: Diagnostic Challenges and Clinical Management - A Case Report

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Abstract

Cesarean Scar Pregnancy (CSP) is a rare and potentially life-threatening form of ectopic pregnancy where implantation occurs within the myometrial defect of a previous hysterotomy scar. Its incidence is rising globally, paralleling the “cesarean epidemic”. We present the case of a 23-year-old patient with a history of two previous cesarean sections with a chief complaint of pelvic pain and vaginal bleeding. Transvaginal ultrasound upon admission showed a gestational sac within the lateral border of the uterine scar. Due to the high risk of catastrophic hemorrhage and uterine rupture associated with expectant or standalone medical management, surgical intervention was performed. The procedure successfully removed the gestational tissue and preserved the patient’s fertility. This case underscores the necessity of early first-trimester screening for women with prior uterine surgery. Individualized surgical management, tailored to CSP classification, remains the most effective strategy for preventing severe maternal morbidity.

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Introduction

Cesarean Scar Pregnancy (CSP) is a rare and potentially life-threatening form of ectopic pregnancy in which the blastocyst implants within the myometrial defect of a previous cesarean section scar [1]. First described in 1978, the incidence of cesarean scar pregnancy has risen significantly over the last few decades, now estimated to occur in approximately 1 in 1.800 to 1 in 2.500 pregnancies [2]. This upward trend is inextricably linked to the “cesarean epidemic,” with global cesarean delivery rates doubling since the year 2000 [3]. Particularly, in Latin America cesarean rates have increased in 30-40%, much above

the cesarean rate recommended by WHO in developing countries [4].

This condition accounts for approximately 6.1% of all ectopic pregnancies in women with at least one prior cesarean delivery [2]. The fundamental pathophysiology mechanisms involve the blastocyst implanting into a “niche” or isthmocele—a failure of myometrial healing from previous surgery [3]. Due to the absence of the normal decidua basalis, aggressive trophoblastic invasion directly into the myometrium occurs, creating a high risk for catastrophic maternal hemorrhage, uterine rupture, and progression to Placenta Accreta Spectrum (PAS) [3]. Early and



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accurate diagnosis is therefore paramount to preserving maternal life and future fertility [3].

Clinical presentation of cesarean scar pregnancy is variable and sometimes unspecific, being vaginal bleeding the most common complaint [5]. However, it's important to note that almost 20-25% of patients remain asymptomatic, and the CSP emerges as an incidental finding in a pregnancy of unknown location [5]. Diagnosis of cesarean scar pregnancy is primarily done via transvaginal or transabdominal ultrasound [2]. Medical or surgical management may be chosen depending on the gestational age, hemodynamic status, and patient preferences [2]. Options for surgical management include excision of the gestational sac via hysteroscopy, laparoscopy or laparotomy, with new emergent approaches such as vacuum aspiration [6]. We present the case of a 23-year-old patient with abdominal pain and moderate vaginal bleeding, with an ultrasound showing a gestational sac within the vertex of the uterine scar of a previous cesarean section. The patient was managed surgically and later discharged without complications.

Case presentation

A 23-year-old woman, G4T4P0A1L2, with a history of two previous cesarean sections, the last one performed two years ago, presented to the emergency department with a one-week complaint of low abdominal pain and moderate vaginal bleeding. The patient had a positive home pregnancy test. Physical examination upon admission revealed long, posterior and closed cervix with residual bleeding. Initial laboratories were performed with a normal CBC with no anemia, and a negative reactive C protein. A transvaginal ultrasound was performed showing a uniform endometrium with a hypotonic, irregular gestational sac with poor choriodecidual reaction located in a defect of a previous uterine scar (Figure 1).

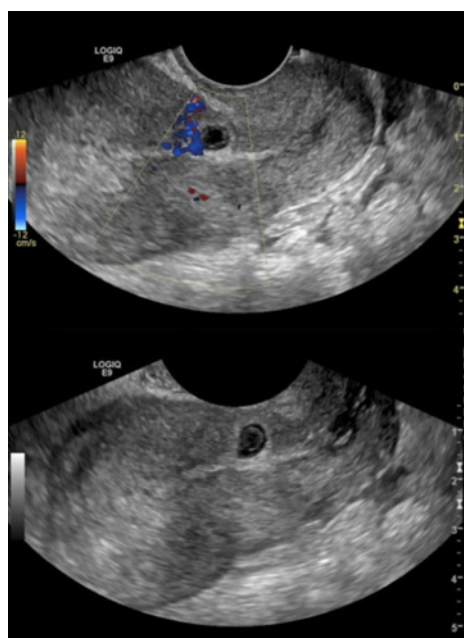


Figure 1: Transvaginal ultrasound showing the gestational sac located within the previous uterine scar (circle).

The patient initially expressed a desire not to undergo surgical management due to her desire for fertility, so hCG levels were requested to determine the possibility of medical management with methotrexate. These levels were measured in 29,078.2 mIU/mL. However, the patient persisted with strong abdominal pain, so she finally accepted surgical management.

Approach through a suprapubic transverse incision was used, subsequently performing a transverse hysterotomy through the previous uterine scar and removal of all ovular remains. Closure was performed in traditional fashion in two layers. The patient had a satisfactory postoperative recovery and was discharged without complications. Pathology report revealed hemorrhagic material, decidua with acute inflammation, fragments of secretory endometrium, and some immature placental villi.

Discussion

The clinical entity of Cesarean Scar Pregnancy (CSP) represents a formidable iatrogenic challenge with non-negligible incidence rates considering the increasing number of cesarean sections performed worldwide [5]. This case involves a 23-year-old patient with a history of two previous cesarean sections, a profile that aligns with literature indicating that the cumulative risk of CSP increases significantly with the total number of prior uterine surgeries [7]. Furthermore, the two-year interval between her last delivery and the current CSP is a critical determinant; intervals of less than two years are associated with incomplete remodeling and maturation of the uterine scar tissue, creating the anatomical substrate for abnormal blastocyst migration [7].

The patient's presentation of low abdominal pain and moderate vaginal bleeding is consistent with the non-specific symptoms often reported in approximately 36.4% to 40% of CSP cases [8]. However, up to 56.7% of patients may remain entirely asymptomatic, emphasizing the necessity of a high index of clinical suspicion in any pregnant woman with a history of uterine surgery [8]. It's important to note that there are no pathognomonic signs or symptoms of cesarean scar ectopic pregnancy [8]. The use of Transvaginal Ultrasound (TVUS) in this case allowed for the identification of the gestational sac within the uterine niche, which remains the first-line diagnostic modality with a sensitivity of 83.75% to 86.4% [9].

Literature suggests that diagnosis is most accurate between the 6th and 7th weeks of gestation, as expanding gestational tissue in later weeks can distort the lower uterine segment, potentially leading to misdiagnosis as a cervical ectopic or low-lying intrauterine pregnancy [9]. This is the reason why it's necessary to perform a complete ultrasonographic evaluation including Doppler to determine high-velocity, low-impedance vascular flow and determination of choriodecidual reaction [9]. Magnetic Resonance Imaging (MRI) is considered superior for risk stratification, offering a 92.16% diagnostic accuracy and better delineation of myometrial invasion depth [9]. However, there is no evidence that MRI adds to the diagnostic accuracy, and it is therefore not recommended for routine evaluation [9].

Effective management of CSP is highly contentious, with over 17 described treatment modalities [10]. In this case, surgical management through laparotomy was performed. While minimally invasive approaches like laparoscopy and hysteroscopic curettage are increasingly favored due to lower morbidity, laparotomy remains a definitive intervention, particularly for complex cases or high-risk classifications [10]. According to the Chinese Medical Society and Qilu classification systems, cases with a Residual Myometrial Thickness (RMT) of < 1 mm or large gestational sacs (Type III) are often most effectively managed through operative resection to ensure complete removal of the pregnancy and simultaneous surgical repair of the uterine niche [7]. Literature suggests that laparotomy is specifically recommended for Type IIIb CSP (RMT ≤ 1 mm and sac > 50 mm) where

the risk of catastrophic intraoperative hemorrhage or bladder invasion is substantial [7].

The choice of surgical intervention over medical therapy is supported by data showing that systemic Methotrexate (MTX) as a standalone treatment has a high failure rate of 57% and a complication rate of 62.1% [10]. This is attributed to the limited vascularization of fibrous scar tissue, which prevents adequate drug concentration from reaching the trophoblastic villi [10]. Furthermore, current guidelines from the Society for Maternal-Fetal Medicine (SMFM) recommend against expectant management, as CSP is viewed as the earliest detectable form of placenta Accreta Spectrum (PAS) [7]. Pregnancies allowed to continue carry extreme risks of uterine rupture, severe hemorrhage, and emergency hysterectomy, so other treatment strategies such as intragestational MTX or surgical options such as dilation and curettage are recommended [11].

Long-term outcomes for this patient must be monitored closely, as the risk of Recurrent CSP (RCSP) ranges from 5% to 40% [3]. While approximately 43% to 67.6% of women who desire subsequent pregnancy achieve a live birth, they remain at high risk for placenta previa and morbidly adherent placenta [5]. This case underscores that early first-trimester screening and individualized surgical management are paramount to preserving maternal life and future reproductive potential, taking into consideration the anatomical location of the gestational sac and the possibility of a minimally invasive approach.

Conclusion

Cesarean scar pregnancy is diagnostic challenge for the obstetrician, that requires a high index of clinical suspicion and a multi-disciplinary approach. Early first-trimester screening via transvaginal ultrasound at 6 to 7 weeks is essential for all women with a history of previous uterine surgery. While various treatment modalities exist, management must be individualized based on the CSP type and the patient's reproductive goals. Surgical strategies, particularly those incorporating UAE or laparoscopic repair, offer superior efficacy and safety compared to standalone medical therapy. Ultimately, the prevention of CSP lies in reducing primary cesarean section rates and improving surgical techniques for uterine closure to ensure optimal myometrial healing.

Author declarations

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Conflicts of interest

All authors declare no conflicts of interest.

Availability of data and material

The data used in the present study is available upon request to the corresponding author.

Ethical standards

Ethical compliance with the Helsinki Declaration, current legislation on research Res. 008430-1993 and Res. 2378-2008 (Colombia) and the International Committee of Medical Journal Editors (ICMJE) were ensured under our Ethics and Research Institutional Committee (IRB) approval, prior signing of informed consent by the patient.

The protocol for this article was previously approved by the Ethics Committee of our institution (Subred Integrada de Servicios de Salud Sur).

Consent to publish

The patient subject of this report previously signed the informed consent form in the presence of two witnesses, authorizing the anonymous use of all the information from her medical history and corresponding images in any publications with scientific or academic interest.

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