



CLINICAL CASE REVIEW OF A PREGNANCY IMPLANTED IN A CESAREAN SECTION SCAR

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Relevance. With the increasing frequency of cesarean deliveries, obstetric practice has seen a rise in complications related to the formation of scar tissue in the lower uterine segment [3,8]. One of the rare but potentially life-threatening complications is an isthmic pregnancy implanted into a uterine scar, also known as a cesarean scar pregnancy (CSP) [4,5].

This type of pregnancy is classified as ectopic, as the gestational sac implants into an area of myometrial dehiscence at the site of a previous cesarean section, disrupting the normal uterine wall structure and exposing the patient to a high risk of massive hemorrhage, uterine rupture, and even death. The reported incidence of this condition ranges from 1:1800 to 1:2656 pregnancies and continues to rise alongside the global increase in cesarean deliveries [3,8].

Cesarean scar pregnancy requires a specific diagnostic and therapeutic approach. If not identified in time, the uterine wall may rupture, leading to severe consequences — from hysterectomy to maternal death [6,7]. Although various management strategies (medical, surgical, and combined) have been described in the literature, there is no universally accepted, evidence-based treatment algorithm.

Objective. To perform a retrospective analysis of isthmic pregnancies localized within cesarean section scars, assess diagnostic features, treatment methods, and outcomes, and identify factors influencing management choices and prognostic indicators.

Materials and methods. This study is a retrospective review of medical records of patients admitted to the Gynecology Department of the Republican Specialized Scientific and Practical Medical Center for Maternal and Child Health (RSSPMCHMCH) between 2023 and 2024 with a confirmed diagnosis of *isthmic pregnancy localized in a cesarean scar.

Inclusion criteria:

- Confirmed diagnosis of cesarean scar pregnancy by ultrasound and/or MRI;
- History of at least one cesarean section;
- Gestational age ≤ 12 weeks at diagnosis;
- Availability of complete medical documentation.

Exclusion criteria:

- Pregnancy implanted in the cervical canal without scar involvement;
- Unconfirmed localization of pregnancy;
- Presence of a uterine scar in the body or fundus only (not in the isthmus);



-Coexisting gynecological diseases interfering with analysis (e.g., cervical cancer).

Diagnosis was based primarily on transvaginal ultrasonography, including Doppler imaging (visualization of the gestational sac in the scar area, absence of myometrium between the sac and bladder, increased vascularity). Myometrial thickness ≤ 2 mm above the scar was considered high risk for perforation. Pelvic MRI was used in some cases to clarify anatomy and assess involvement of adjacent structures. Serum β -hCG levels and clinical symptoms (bleeding, pain) were recorded.

Patients were divided into four groups according to treatment method:

1. Medical therapy — systemic or local administration of methotrexate (MTX).
2. Surgical treatment — laparotomy/laparoscopy with scar excision and gestational sac removal; in some cases, hysteroscopy.
3. Combined approach — sequential use of MTX followed by surgery.
4. Conservative management — used in selected cases (anembryonic pregnancy, absent cardiac activity, spontaneous regression, patient's wish to avoid surgery).

Results. A total of 55 patients with isthmic cesarean scar pregnancy were analyzed. Patient age ranged from 23 to 42 years, with a mean of 31.7 ± 4.9 years. 38 (69.1 %) had one previous cesarean section, 13 (23.6 %) had two, 4 (7.3 %) had three or more. The mean gestational age at diagnosis was 7.6 ± 1.2 weeks. Embryonic cardiac activity was visualized in 37 (67.3 %) cases, while 12 (21.8 %) pregnancies were anembryonic. Myometrial thickness over the scar ranged from 0.8 to 3.5 mm (mean = 1.5 ± 0.6 mm). 18 patients (32.7 %) presented with vaginal bleeding and/or lower abdominal pain.

Treatment selection was determined by gestational age, cardiac activity, myometrial thickness, clinical symptoms, reproductive plans, and available resources.

Table 1. Treatment Methods

Treatment Method	Number of Patients (n)	%
Medical therapy	17	30,9%
Surgical treatment	24	43,6%
Combined approach	9	16,4%
Conservative observation	5	9,1%

Surgical interventions included: Laparoscopic resection of scar area (n = 11), Laparotomy with excision and defect repair (n = 9), Hysteroscopic evacuation with vessel coagulation (n = 4).

The combined approach was mainly used in cases with cardiac activity and thin myometrium: MTX administration followed by surgery.

Table 2. Complications and Adverse Outcomes

Treatment Method	Number of Patients (n)	%
Heavy bleeding (>500 ml)	8	14,5%



Uterine perforation	2	3,6%
Blood transfusion required	5	9,1%
Emergency hysterectomy	1	1,8%
Uterine preservation	54	98,2%

Most complications occurred in the surgical treatment group among patients diagnosed after ≥ 9 weeks of gestation and with marked scar vascularization.

The only hysterectomy was performed in an emergency due to massive bleeding in a patient misdiagnosed with a spontaneous abortion.

Table 3. Outcomes by Time of Diagnosis

Parameter	≤ 8 weeks (n=33)	> 8 weeks (n=22)	p-value
Blood loss > 500 ml	1 (3,0 %)	7 (31,8 %)	< 0.01
Uterine preservation	33 (100 %)	21 (95,4 %)	> 0.05
Hysterectomy required	0 (0 %)	1 (4,5 %)	> 0.05

Patients diagnosed before 8 weeks had significantly better outcomes, lower complication rates, and less frequent need for surgical intervention. Among the 55 patients, 39 (70.9 %) were followed for ≥ 12 months. Of these:

- 9 (23.1 %) conceived again;
- 6 achieved normal term pregnancies;
- 2 underwent elective termination;
- 1 had an ectopic (tubal) pregnancy 9 months later.

Discussion. Cesarean scar pregnancy is a rare but highly dangerous condition, associated with a substantial risk of uterine rupture, massive bleeding, and loss of reproductive potential. This retrospective analysis of 55 cases provides a meaningful overview of clinical features, management strategies, and outcomes.

Our data confirm that early diagnosis (before 8 weeks) dramatically reduces complication rates. Similar findings are reported by international authors — for instance, Timor-Tritsch et al. (2020) showed that early diagnosis ($\leq 8-9$ weeks) is associated with a significantly lower risk of hemorrhage and hysterectomy [9].

Most patients in our series shared the classic risk triad: one or more uterine scars, thin myometrium (< 2 mm), and visualization of the gestational sac within the scar by ultrasound.

Treatment was individualized. Methotrexate therapy proved effective in early, asymptomatic cases without cardiac activity. However, its effectiveness decreases with advancing gestation (> 8 weeks), presence of cardiac activity, or thin myometrium, consistent with other reports [1].



Surgical management showed the highest success rate in complete evacuation and prevention of complications. Laparoscopic scar resection preserved the uterus and minimized blood loss in most cases. Combined approaches were reserved for complex cases and appear optimal when prognosis is uncertain.

A notable finding is the high rate of fertility preservation — among women followed up, six achieved successful term pregnancies, underscoring the importance of conservative, uterus-preserving management whenever feasible.

Our results align with systematic reviews [2], confirming that success depends on early diagnosis, individualized treatment, and continuous follow-up.

Conclusions. Isthmic pregnancy implanted in a cesarean section scar poses a serious health risk, particularly when diagnosed late or managed without standardized protocols. Based on 55 clinical cases, we conclude that: early diagnosis (≤ 8 weeks) is the key predictor of favorable outcome. Ultrasound evaluation, including myometrial thickness measurement and Doppler imaging, is essential in all suspected cases. Medical therapy is effective only in early pregnancies without cardiac activity. Surgical treatment effectively removes the gestational sac and restores scar integrity. Combined methods are recommended for cases with high vascularization or embryonic cardiac activity. Fertility preservation is achievable with organ-sparing techniques and individualized management. To optimize outcomes, the development of standardized diagnostic and treatment protocols, professional training, and prospective studies evaluating long-term reproductive outcomes are urgently needed.

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