Original Article

Obstetric outcomes in the expectant management of cesarean scar pregnancy with fetal heart activity: a single-center retrospective cohort study

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Background: Cesarean scar pregnancy (CSP) is a high-risk complication characterized by the implantation of a pregnancy within a cesarean scar resulting from a previous delivery. Currently, clinical indicators guiding the expectant management of patients with CSP are lacking. We thus aimed to evaluate pregnancy and neonatal outcomes among women who underwent expectant CSP management and to investigate whether sonographic signs correlated with obstetric outcomes.

Methods: We retrospective reviewed the electronic medical records and first-trimester transvaginal ultrasonography reports of consecutive patients diagnosed with CSP in the first trimester at the West China Second University Hospital from January 1, 2010 to December 31, 2022. Pregnancy outcomes (emergency surgery, blood loss, and rescue) and neonatal outcomes (gestational age at delivery, neonatal weight, and Apgar scores) were examined. A binary logistic regression analysis was conducted to identify independent risk factors that could predict severe complications.

Results: The final analysis included 54 patients. The mean age of the pregnant women was 34±4 years. Among the 54 patients, 14 (25.9%) did not progress to 20 weeks of gestation. Pregnancy continued beyond 20 weeks in 40 patients, with 37 live births (92.5%) and 3 stillbirths (7.5%). Moreover, 7 (17.5%) and 33 (82.5%) patients delivered before and after 34 weeks, respectively. Placenta accreta spectrum (PAS) and placenta previa were confirmed in 29 (72.5%) and 17 (42.5%) patients, respectively. Hysterectomy, emergency cesarean section, and rescue surgery were performed in 5 (12.5%), 15 (37.5%), and 22 (55.5%) patients, respectively. Patients with a visible niche were significantly more likely to have preterm labor, PAS, placenta previa, low-birth-weight newborns, higher blood loss, intraoperative rescue, blood transfusion, and first-trimester vaginal bleeding than were those without one (all P values <0.05).

Conclusions: Our study showed that expectant management of CSP to achieve live birth might be feasible. Patients with a visible niche exhibited worse outcomes, with a higher incidence of severe delivery complications.

Keywords: Cesarean scar pregnancy (CSP); pregnancy outcome; prenatal ultrasonography; niche

Submitted Mar 13, 2024. Accepted for publication Jul 26, 2024. Published online Aug 22, 2024.
doi: 10.21037/qims-24-500
View this article at: https://dx.doi.org/10.21037/qims-24-500

Introduction

With the rising rates of cesarean delivery (CD) worldwide, an increasing number of pregnant women are being left with cesarean scars, a remnant from prior cesarean sections (1). In such cases, subsequent pregnancies face the potential risk of implantation within or on the cesarean scar, which is known as cesarean scar pregnancy (CSP). Women with CSP are prone to severe complications, such as hemorrhage, placenta accreta spectrum (PAS), and uterine rupture in the second and third trimesters of pregnancy (2-6). The number of reported CSP cases has increased over the last few decades, which is attributed to an overall increase in the frequency of CD and improvements in the detection of CSP via ultrasonography in the first trimester. The estimated incidence of CSP in the United States varies, ranging from approximately 1 in 1,800 to 1 in 2,656 for pregnancies following a previous CD, with an overall occurrence of approximately 1 in 6,666 pregnancies (2,7-10).

Although CSP is often considered an indication for pregnancy termination (11), there are some reports of successful progression to intrauterine pregnancy resulting in viable births, especially in women with difficulties in becoming pregnant (2-6). However, to date, no standardized evaluation criteria or guidance indicators exist for the management of CSP; therefore, there is an urgent need to identify reliable indicators in early pregnancy that can inform counseling for the expectant management of patients with CSP.

Recent studies have demonstrated that the specific characteristics of the gestational sac (GS) implantation pattern in the cesarean scar, as detected with ultrasonography, can serve as diagnostic indicators. These include myometrial thickness (MMT), CSP type, and cross-over sign (4,5,12-16). With the growing recognition and understanding of CSP, its definition has changed. A pregnancy that is implanted near but not in direct contact with the cesarean scar or niche (a defective scar) is now defined as a low-implantation pregnancy rather than as CSP (17). Previous reports of expectant management of CSP also included such cases of low-implantation pregnancy; therefore, the available data on CSP outcomes and complications do not accurately reflect the current situation of CSP (4).

To address this issue, we aimed to assess the maternal outcomes (emergency surgery, blood loss, and rescue) and neonatal outcomes (gestational age at delivery, neonatal weight, and Apgar scores) among women who underwent expectant management of CSP and to determine whether sonographic signs correlated with obstetric outcomes. We present this article in accordance with the STROBE reporting checklist (available at https://qims.amegroups.com/article/view/10.21037/qims-24-500/rc).

Methods

Patients

In this retrospective cohort study, we reviewed the electronic medical records and first-trimester transvaginal ultrasonography reports of consecutive patients diagnosed with CSP during the first trimester in the West China Second University Hospital between January 1, 2010 and December 31, 2022. When more than one first-trimester transvaginal ultrasonography examination was conducted, the examination in which the GS was initially observed was selected for analysis. The inclusion criteria were the confirmation of singleton CSP pregnancy with a heartbeat and gestational age at diagnosis of ≤13 weeks. The exclusion criteria were as follows: (I) early pregnancy termination after CSP diagnosis or loss to follow-up, (II) pregnancy complicated with coagulation disorders disease (e.g., hemophilia) or uterine malformation, and (III) diagnosis of low-implantation pregnancy (*Figure 1*). In our center, patients diagnosed with CSP received comprehensive counseling regarding the high risk associated with CSP. Management plans were formulated according to the severity of CSP, clinical symptoms, MMT, and patients' wishes. Patients who continued with CSP were closely monitored.

This study was conducted in accordance with the Declaration of Helsinki (as revised in 2013) and was approved by the Ethics Committee of the West China Second University Hospital of Sichuan University (ethical approval No. [2023] 246). The requirement for the acquisition of informed consent from patients was waived owing to the noninvasive, anonymous, and retrospective nature of the study design.

Ultrasonography and measurements

The diagnosis of CSP was based on the following criteria: (I) an empty uterine cavity and cervical canal; (II) the GS located in the anterior wall of the isthmic portion of the uterus; (III) the GS embedded within the myometrium, with the absence of or a defect in the myometrium between the bladder and the GS; and (IV) high-velocity, low-impedance

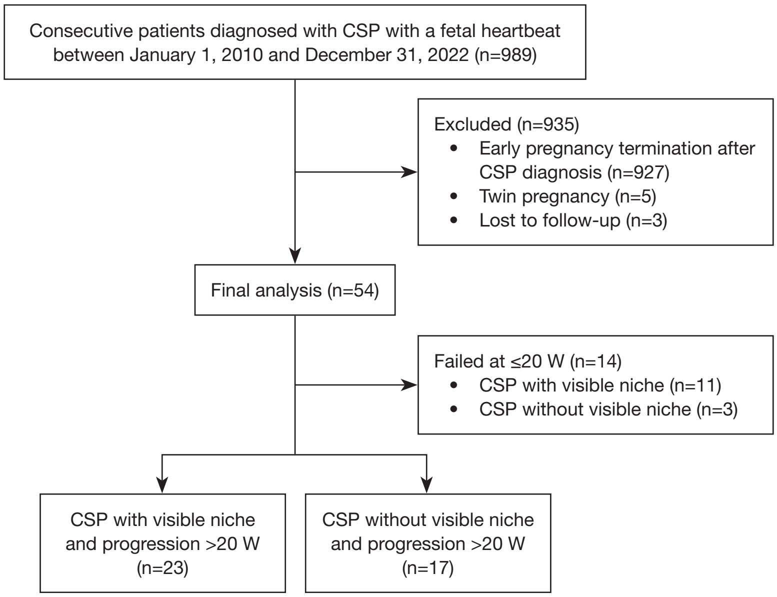

Figure 1 Flowchart of the study. CSP, cesarean scar pregnancy; W, weeks.

vascular flow surrounding the GS. The gestational age was calculated based on the date of the last menstrual period and was determined using ultrasound according to the measurement of the crown-rump length when the embryonic pole was visible.

Trained radiologists with >3 years of experience measured the MMT between the outer edge of the hyperechoic implantation site and the uterine/bladder serosa. The patients were divided into two groups according to the presence or absence of a visible "niche". Implantation "in the niche" was defined as placenta implantation in a deficient or dehiscent scar (4,12,18) (*Figure 2*).

The following clinical characteristics were evaluated: maternal age, history of CD and CSP, vaginal bleeding/abdominal pain in the first trimester, gestational age at the first transvaginal ultrasonography, gestational age at birth, delivery mode, and presence of placenta previa and PAS. The following maternal complications were assessed: blood loss, blood transfusion, intraoperative rescue, uterine rupture, and massive bleeding requiring hysterectomy. Additionally, the neonatal birth weight and Apgar scores at 1 minute were assessed. The diagnosis of PAS, including placenta accreta, increta, and percreta, was based on intraoperative findings and histopathological examination of surgical specimen when available (19). Uterine rupture included complete and incomplete ruptures. Blood loss was quantified using the volume of suction containers and weight of gauze. Severe complications were defined as follows: severe intraoperative hemorrhage (intraoperative blood loss ≥1,000 mL); severe forms of PAS, including placenta increta or placenta percreta; and uterine rupture.

Statistical analysis

Data distribution was tested for normality using the Kolmogorov-Smirnov test. Normally distributed variables were compared using the independent samples *t*-test and are presented as means with standard deviations. Nonnormally distributed variables were compared using the Mann-Whitney test and are presented medians and interquartile ranges (25th–75th percentile). Categorical data are summarized as ratios and percentages. Differences in proportions were analyzed using the χ^2 or Kruskal-Wallis test. Correlation analysis between dichotomous variables and continuous variables was conducted using the point-biserial test, while that between continuous variables was conducted using the Spearman correlation analysis. A two-sided P value <0.05 was considered to indicate statistical significance. For cases in which the P value was <0.10 in the univariate logistic regression analysis, a binary logistic regression analysis was conducted to identify independent risk factors that could predict severe complications. All statistical tests were performed using SPSS software version 27.0 (IBM Corp., Armonk, NY, USA).

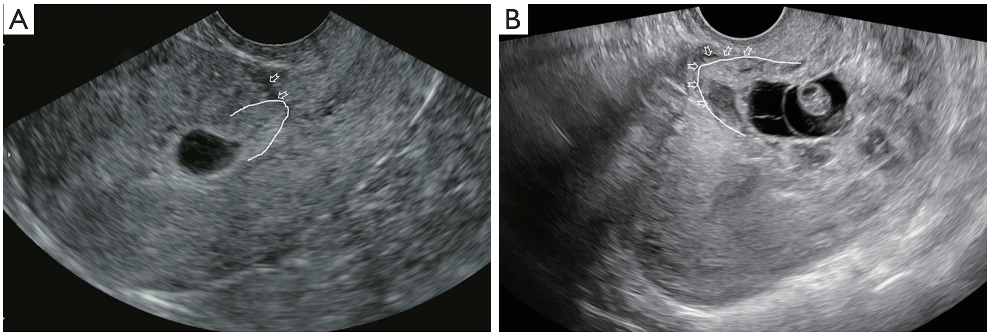

Figure 2 Ultrasonography findings of CSP with or without a visible niche. (A) CSP without a visible niche. The arrows show the scar, which is visible as a hypoechogenic area. The solid white lines outline the outer edge of the villous chorionic. (B) CSP with a visible niche (arrows). Solid white lines outline the outer edge of the villous chorionic. CSP, cesarean scar pregnancy.

Table 1 Characteristics of patients included in this study

Variable	Value
Age (years), mean ± SD	34±4
Gestational age at diagnosis (days), median [IQR]	55 [43–63]
Gestational sac length (mm), mean ± SD	4.1±1.8
MMT (mm), median [IQR]	2.5 [1.5–5.4]
Median time interval between the last cesarean section and current CSP (years), median [IQR]	7 [4–10]
History of CD, n (%)	
1	46 (85.2)
2	8 (14.8)
History of CSP, n (%)	7 (13.0)
Vaginal bleeding in the first trimester, n (%)	23 (42.6)
Abdominal pain in the first trimester, n (%)	6 (11.1)

SD, standard deviation; IQR, interquartile range; MMT, myometrial thickness; CSP, cesarean scar pregnancy; CD, cesarean delivery.

Results

During the 13-year study period, 57 patients diagnosed with CSP with a fetal heartbeat underwent expectant management at our center. Three patients who were lost to follow-up were excluded, and the remaining 54 patients were included in the final analysis. *Table 1* summarizes the population characteristics of patients included in this study. The mean age of the pregnant women was 34±4 years, the median gestational age at CSP diagnosis was 55 [interquartile range (IQR): 20] days, and seven (13.0%) patients had a history of CSP. Among the 54 patients, a niche was detected in 34 (63.0%) patients. Overall, 14 (25.9%) patients did not progress to 20 weeks of gestation. Among them, 13 (24.1%) patients had a miscarriage during expectant management, of whom 2 experienced a miscarriage after 13 weeks (1 at 14+5 weeks and 1 at 15 weeks). Labor induction was performed in one (1.9%) patient at 15 weeks owing to vaginal bleeding, and pathological results confirmed the presence of placenta increta. A summary of the findings in women with CSP is shown in *Figure 3*.

In 40 patients, the pregnancy continued beyond 20 weeks of gestation, resulting in 37 live births (92.5%) and 3 stillbirths (7.5%). Among these 40 patients, 17 (42.5%) delivered before 37 weeks, 23 (57.5%) delivered after 37 weeks, and 7 (17.5%) patients delivered before 34 weeks. Of these 40 women, only 1 (2.5%) had a successful vaginal

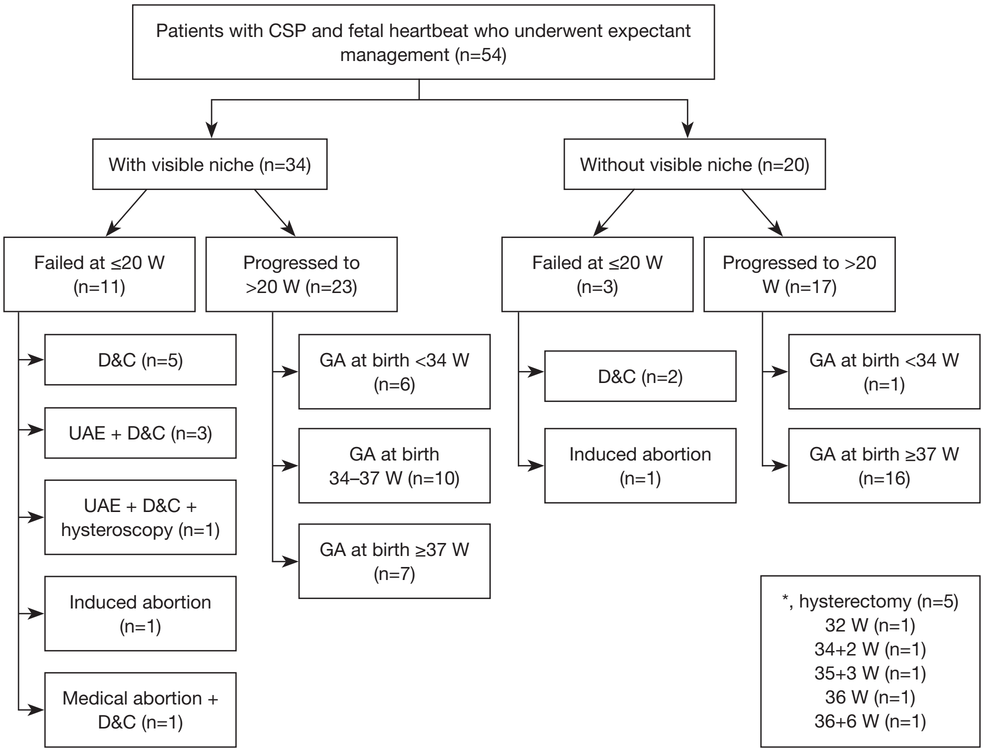

Figure 3 Summary of the findings in women with CSP. CSP, cesarean scar pregnancy; W, weeks; D&C, dilatation and curettage; UAE, uterine artery embolization; GA, gestational age.

delivery. The median intrapartum blood loss volume was 810 mL (IQR: 400–1,875 mL), and 18 patients (45.0%) required blood transfusions during the CD. Among the 40 patients, PAS was confirmed in 29 (72.5%) based on the pathological and intraoperative results, whereas placenta previa was diagnosed in 17 (42.5%) of these patients; 6 (15.0%) patients experienced uterine rupture. Hysterectomy was performed in 5 (12.5%) patients. Only one case had planned hysterectomy before the operation, and the other four cases had hysterectomy immediately during the operation when attempts to preserve the uterus had failed. Additionally, 15 (37.5%) patients underwent emergency cesarean section, whereas 22 (55.0%) patients required rescue procedures during surgery owing to massive bleeding. Ligation of the ascending branch of the uterine artery/uterine binding was performed in 20 (50%) patients to prevent blood loss. One patient underwent balloon tamponade of the uterine cavity. The median neonatal birth weight was 2,730 g (IQR: 2,285–3,230 g). Among the 37 live births, the Apgar scores at 1 minute was 5 points in 1 (2.7%) newborn, 7 points in 2 (5.4%) newborns, and >7 points in 34 (91.9%) newborns. *Table 2* presents the population characteristics and gestational outcomes of 23 patients with CSP with a visible niche and 17 patients with CSP without a visible niche among the 40 women who progressed beyond 20 weeks of gestation. The groups with and without a visible niche showed significant differences with respect to the occurrence of PAS, placenta previa, intraoperative rescue, blood transfusion, and vaginal bleeding in the first trimester, neonatal birth weight, and blood loss volume (all P values <0.05). PAS occurred in all 23 patients with CSP with a visible niche, including 8 (34.8%) patients with placenta percreta (2 involved the bladder), 10 (43.5%) with placenta increta, and 5 (21.7%) with placenta accreta. PAS was confirmed in 6 (35.3%) patients with CSP without a visible niche, including 1 patient with placenta increta and 5 patients with placenta accreta. No significant differences in patient age, gestational age at diagnosis, median GS length, history of CD, history of CSP, stillborn delivery, uterine rupture, or hysterectomy were observed between the two groups. Among the patients with a visible niche who had progressed beyond 20 weeks of gestation, four were diagnosed after 9 weeks, and all four had severe complications. Out of the

Table 2 Population characteristics and pregnancy outcomes of patients with CSP who progressed beyond 20 weeks of gestation

Variable	Patients with a visible niche (n=23)	Patients without a visible niche (n=17)	P value
Age (years), mean ± SD	35.1±3.7	33.3±3.5	0.877
Gestational age at diagnosis (days), median [IQR]	54 [43–62]	61 [49–67]	0.149
Gestational sac length (mm), mean ± SD	4.1±1.8	4.5±1.8	0.918
MMT (mm), median [IQR]	1.8 [1.4–2.7]	5.3 [4.4–6.7]	<0.001*
History of CD, n (%)			0.649
1	19 (82.6)	14 (82.4)	
2	4 (17.4)	3 (17.6)	
Median time interval between the last cesarean section and current CSP (years), median [IQR]	10 [7–12]	5 [3–7.5]	0.004*
History of CSP, n (%)	3 (13.0)	3 (17.6)	0.511
Vaginal bleeding in the first trimester, n (%)	15 (65.2)	3 (17.6)	0.004*
PAS, n (%)	23 (100.0)	6 (35.3)	<0.001*
Placenta previa, n (%)	16 (69.6)	1 (5.9)	<0.001*
Stillborn, n (%)	3 (13.0)	0 (0.0)	0.248
Intraoperative rescue, n (%)	18 (78.3)	4 (23.5)	0.001*
Uterine rupture, n (%)	5 (21.7)	1 (5.9)	0.216
Hysterectomy, n (%)	5 (21.7)	0 (0.0)	0.061
Preterm labor, n (%)	16 (69.6)	1 (5.9)	<0.001*
Blood loss volume (mL), median [IQR]	1,500 [900–2,500]	400 [400–450]	<0.001*
Neonatal birth weight (g), median [IQR]	2,430 [1,740–2,770]	3,250 [2,935–3,550]	<0.001*

*, P<0.05. CSP, cesarean scar pregnancy; SD, standard deviation; IQR, interquartile range; MMT, myometrial thickness; CD, cesarean delivery; PAS, placenta accreta spectrum.

19 patients who were diagnosed before 9 weeks, 17 (89.5%) had severe complications, and 2 (10.5%) had no severe complications. There was no significant difference in the occurrence of severe complications according to whether the gestational age at diagnosis was less or more than 9 weeks. Of the 23 patients with CSP with a visible niche, 5 underwent hysterectomy (*Figure 4*). The mean MMTs were 2.26±0.76 and 2.20±0.97 mm in the hysterectomy and nonhysterectomy groups, respectively (P=0.542). The mean gestational age was 52.4±11.9 days in the hysterectomy group and 52.9±12.4 days in the nonhysterectomy group (P=0.857). In all 17 cases of CSP with no visible niche beyond 20 weeks of gestation, the MMT was >4 mm. Incomplete uterine rupture was found in 1 of these 17 (5.9%) patients. Among these 17 patients, only 1 delivered before 34 weeks owing to cervical insufficiency.

A binary logistic regression analysis was performed to identify independent risk factors that could predict severe complications in patients who progressed beyond 20 weeks of gestation. The univariate logistic regression analysis results are shown in *Table 3*. Parameters with P<0.10, such as age, gestational age at diagnosis, median time interval between the last cesarean section and current CSP, and presence/absence of a visible niche, were included in the multivariable logistic regression analysis. There was a correlation between the parameter presence/absence of a visible niche and MMT (P<0.001), so the MMT parameter was not included in the multivariable logistic regression analysis. *Table 4* presents the results of multivariable logistic regression analysis. Presence/absence of a visible niche was an independent risk factor that could predict severe complications (P<0.001).

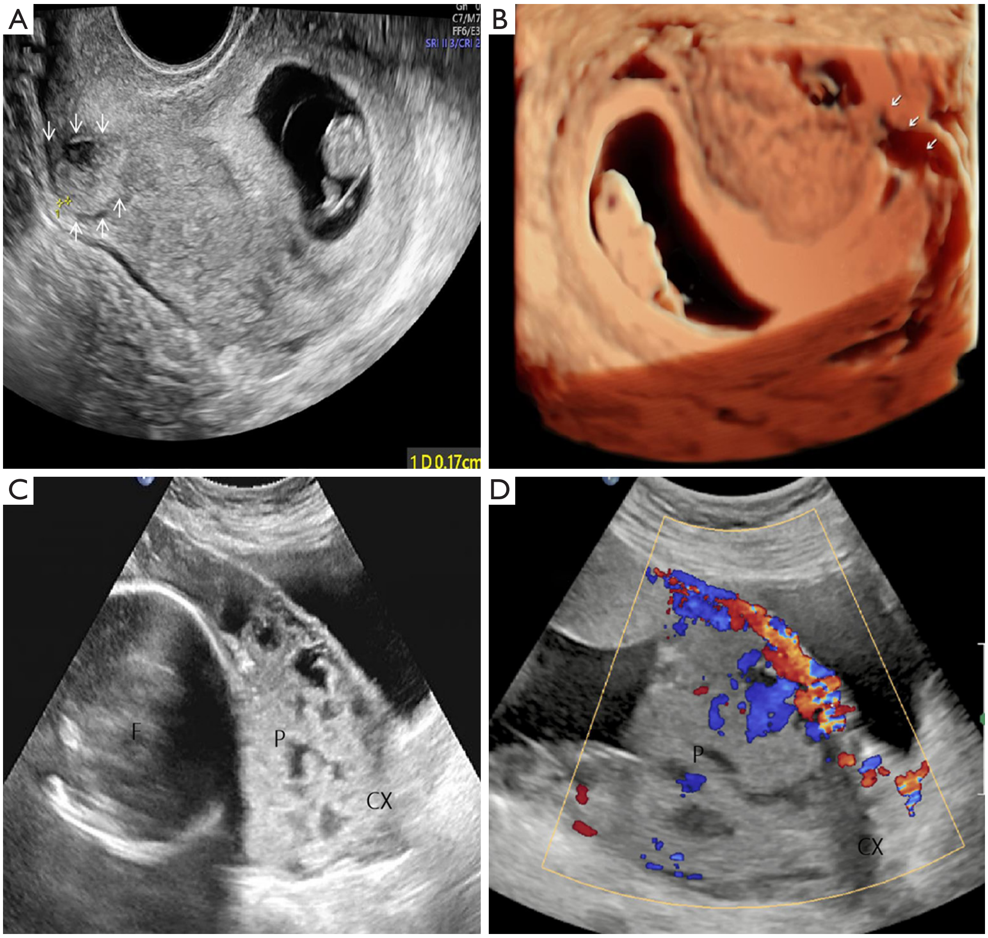

Figure 4 Ultrasonography findings of one patient with CSP who underwent hysterectomy due to massive bleeding. (A) Two-dimensional sonogram of a woman at 8+6 weeks of gestation, showing CSP with a visible niche (arrows) and thin myometrium, measured at 0.17 cm. (B) Three-dimensional ultrasonography image of the CSP. The niche is visible (arrows). (C) Placenta percreta in the ultrasonography images of the same patient at 30+1 weeks of gestation, which was confirmed histologically. Placental lacunae and bladder flap varices could be observed. (D) Color flow image showing the distinct high-velocity, turbulent blood flow within the lacunae next to the bladder. F, fetus; P, placenta; CX, cervix; CSP, cesarean scar pregnancy.

Discussion

Our study showed that expectant management of CSP to achieve live birth might be feasible; however, patients with a visible niche had worse outcomes and more severe delivery complications than did those without.

CSP has varied clinical manifestations, with vaginal bleeding being the most common complaint, with or without abdominal pain (20-22). In our study, 42.6% of women with CSP experienced vaginal bleeding in the first trimester, whereas half of the patients had no apparent symptoms. Therefore, diagnosing CSP is challenging, particularly in asymptomatic patients. For pregnant women with a history of CD, transvaginal ultrasonography is considered the preferred method for diagnosing CSP (9,23,24). However, some centers consider that a combined transabdominal and transvaginal ultrasonography technique is superior (25).

Expectant management in women diagnosed with CSP is associated with many complications (2-6,26-30). In our study, 25.0% of women with CSP who underwent expectant management did not have a live birth. PAS was the most common complication, especially in cases where the niche was visible; in fact, all patients with CSP with a visible niche developed PAS. Placenta previa and preterm birth were also

Table 3 Univariate logistic regression analysis results of risk factors predicting severe complications of patients with CSP who progressed beyond 20 weeks of gestation

Variable	OR	95% CI		P value
		Low	Up	
Age (years)	1.187	0.974	1.447	0.089*
Gestational age at diagnosis (days)	0.950	0.899	1.005	0.072*
Gestational sac length (mm)	0.813	0.564	1.174	0.270
Median time interval between the last cesarean section and current CSP (years)	1.260	1.042	1.524	0.017*
MMT (mm)	0.176	0.061	0.514	0.001*
History of CD	2.353	0.398	13.900	0.345
History of CSP	1.267	0.223	7.199	0.790
Presence/absence of a visible niche	168.00	13.971	2020.239	<0.001*

*, P<0.10. OR, odds ratio; CI, confidence interval; CSP, cesarean scar pregnancy; CD, cesarean delivery; MMT, myometrial thickness.

Table 4 Multivariable logistic regression analysis results of risk factors predicting severe complications of patients with CSP who progressed beyond 20 weeks of gestation

Variable	OR	95% CI		P value
		Low	Up	
Age (years)	1.093	0.750	1.592	0.644
Gestational age at diagnosis (days)	0.926	0.822	1.042	0.202
Median time interval between the last cesarean section and current CSP (years)	1.143	0.807	1.167	0.452
Presence/absence of a visible niche	155.135	8.079	2,763.476	<0.001*

*, P<0.05. OR, odds ratio; CI, confidence interval; CSP, cesarean scar pregnancy.

common complications.

Ultrasonography parameters at diagnosis have been reported to correlate with the prognosis of patients with CSP undergoing expectant management. Some studies have suggested an association between the location of the GS implantation and the occurrence of serious complications (4,5,12-16). Jordans *et al.* (18) divided CSP into endogenous and exogenous types according to the site of GS implantation. Our findings revealed that thinning of the incised muscle layer and worse pregnancy outcomes were more common in CSP with a visible niche than in CSP without a visible niche. This was consistent with the results of previous studies (4,12). With the increasing number of studies on CSP, the knowledge of CSP has expanded. In 2022, the Niche Task Force convened and proposed a Delphi procedure to develop a standardized sonographic evaluation and reporting system for CSP in the first trimester; they suggested that CSP can only occur when a niche is present and not when there is a healed cesarean scar (17). However, few small-sample studies have been conducted on CSP pregnancy outcomes with or without a visible niche (12) or in which the outcome indicator only includes hysterectomy (4). Our findings represent additional evidence for the Niche Task Force recommendations. Outcomes of CSP with and without a cesarean scar defect (i.e., a niche) may differ with expectant management, indicating that cases of CSP may require different management strategies. Moreover, cesarean scar defect repair before pregnancy may contribute to a low pregnancy complication rate and good pregnancy outcomes (31,32).

The results of our study also support the hypothesis that CSP and PAS have similar histopathological features;

thus, these conditions may not be viewed as separate entities but rather as an evolution of the same condition throughout the pregnancy. Several possible mechanisms have been suggested for implantation of the GS in CSP and PAS (33-36). One is invasion of the myometrium through the microtubule fissure between the cesarean scar and endometrial tube. Myometrial scar tissues often present with muscle fiber disturbance, inflammation, blastogenesis, tissue edema, apoptosis, and reduced smooth muscle volume density, allowing extravillous trophoblast cells to invade more than one-third of the inner myometrium and reach the perimetrium blood vessels. In addition, the myometrium of a scar replicates an anoxic environment that stimulates trophoblast invasion deep into the muscle layer, potentially resulting in PAS (35).

In our study, the hysterectomy rates were lower than those reported in previous studies. For example, Spong *et al.* (4) reported that 29% of patients with CSP whose pregnancies progressed beyond 20 weeks required hysterectomy at delivery; however, only hysterectomy was analyzed as an indicator of severe pregnancy complications in their study. In a case-series study performed in 2017, Kaelin Agten *et al.* (12) reported a hysterectomy rate of 64.7% at delivery. A recent review reported that out of 192 patients under expectant management, 102 (53.1%) ultimately underwent hysterectomy (5). By contrast, in this study, hysterectomy was performed in only 5 (12.5%) patients. This may be attributable to the close monitoring after CSP diagnosis, adequate preoperative preparation, and the use of intraoperative uterine artery ligation to prevent postpartum hemorrhage. Furthermore, the results of our study differed from those of a previous study which we did not find a significant difference in the MMT or gestational age at diagnosis between patients with and without hysterectomy in the visible niche group (2). The risk of hysterectomy was comparable in cases with an MMT of ≤4 mm, and gestational age at diagnosis was not found to be a predictor of hysterectomy. Unlike the results of a previous review (37), the gestational age at first diagnosis of CSP was not found to be associated with the pregnancy outcomes. The gestational age at CSP diagnosis also did not show a significant association with MMT and cesarean scar healing.

This study involved certain limitations which should be addressed. First, the study sample size was small owing to the rarity of CSP and because the majority of patients chose to terminate pregnancy at the early diagnosis of CSP. Second, the exclusion of patients who were lost to follow-up might constitute a source of bias. Finally, as we employed a retrospective design, a prospective study with a larger population is required to validate the findings of this study.

Conclusions

The results of our study suggest that the expectant management of CSP to achieve live birth might be feasible. Patients with CSP with a visible niche exhibited worse outcomes and had a higher incidence of severe delivery complications than did patients with CSP without a visible niche. Close monitoring, timely cesarean section, and uterine artery ligation may reduce the hysterectomy rates in patients with CSP.

Acknowledgments

Funding: This research was funded by the National Key R&D Program of China (grant No. 2022YFC2703300).

Footnote

Reporting Checklist: The authors have completed the STROBE reporting checklist. Available at https://qims.amegroups.com/article/view/10.21037/qims-24-500/rc

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at https://qims.amegroups.com/article/view/10.21037/qims-24-500/coif). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. This study was conducted in accordance with the Declaration of Helsinki (as revised in 2013) and was approved by Ethics Committee of the West China Second University Hospital of Sichuan University (ethical approval No. [2023] 246). The requirement for the acquisition of informed consent from patients was waived owing to the noninvasive, anonymous, and retrospective nature of the analysis.

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Cite this article as: Li C, Chen W, Xu H, Luo H. Obstetric outcomes in the expectant management of cesarean scar pregnancy with fetal heart activity: a single-center retrospective cohort study. Quant Imaging Med Surg 2024;14(9):6590-6600. doi: 10.21037/qims-24-500

