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Original Article

Reproductive outcomes after previous cesarean scar pregnancy:
Follow up of 189 women

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ABSTRACT

Objective: To investigate the reproductive and pregnancy outcomes of women after previous Cesarean Scar Pregnancy.**Materials and methods:** From January 2009 to December 2013, a total of 214 patients with CSP received surgical evacuation treatment by means of dilation and suction evacuation and local resection of the ectopic gestational mass. A telephone follow-up was conducted every year after CSP treatment. The follow-up was ended on December 2014.**Results:** Twenty-five patients were lost to follow-up due to loss of contacts. The previous medical records of the remaining 189 women were reviewed. Fifty-eight women wished to give birth again. However, 48 (82.8%, 48/58) of them stopped the attempts to get pregnant because they were afraid of recurrent CSP and the high risk of uterine rupture during the subsequent pregnancy. The other 10 women spontaneously attempted to get pregnant again, among whom 6 (60%, 6/10) succeeded with the birth of 7 healthy babies. A total of 32 women conceived again, either in plan or by chance. Five women (15.6%, 5/32) experiencing recurrent CSP.**Conclusion:** Even though our result did not necessarily represent the true recurrence rate, our study provided some evidence about the likelihood of fertility and recurrence risk for future pregnancies after previous CSP.

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Introduction

Cesarean scar pregnancy (CSP) is an uncommon type of ectopic pregnancy in which the gestational sac is implanted in the myometrium and fibrous tissue of the cesarean scar [1]. The main purpose of treatment for CSP is to preserve fertility and prevent severe complications such as uterine rupture and excessive bleeding. There is still no consensus on the optimal treatment for CSP among obstetricians. The reason is probably the lack of data on fertility or subsequent pregnancy after treatment for CSP [2]. Therefore, we conducted follow up of 189 CSP patients to investigate their reproductive and pregnancy outcomes.

Materials and methods

This observational study was approved by the Institutional Review Board in West China Second Hospital of Sichuan University in Chengdu, China. Signed informed consent forms were collected from all participants whose clinical data were analyzed.

In our hospital, patients were diagnosed with CSP according to cesarean delivery history, serum β -human chorionic gonadotrophin (β -hCG) level and ultrasonography. Ultrasound diagnosis was made according to the following criteria [3]: (1) an empty uterine cavity with a clearly demonstrated endometrium; (2) an empty cervical canal; (3) the gestational sac was located in the anterior part of the uterine isthmus, with decreased myometrial thickness between the bladder and the sac; and (4) the gestational sac was implanted in the myometrium and fibrous tissue of the cesarean delivery scar.

From January 2009 to December 2013, 214 patients with CSP received surgical evacuation by means of dilation and suction curettage (D&C) and local resection of the ectopic gestational mass

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(via laparotomy, laparoscopy, hysteroscopy or transvaginal operation). All the above 214 patients were included in the observation. Telephone follow up was conducted every year after CSP treatment and ended on October 31, 2014. All the telephone calls were completed by two of the authors (QW and HP). After the questionnaire had been drafted and approved by all the authors, QW and HP invited five patients in our hospital to test whether the questionnaire could be easily and correctly understood. The questionnaire consisted of three sections: basic information, review of previous CSP medical data, and subsequent reproductive outcome information.

Results

Twenty-five patients were lost to follow up due to loss of contacts. The previous medical records of the remaining 189 women were reviewed. One hundred and five were treated through uterine artery embolization (UAE) combined with D&C within 72 hours of diagnosis of CSP. Fifty-three women underwent D&C alone. The other 31 received surgical resection.

According to the results of telephone follow up, 58 women wished to give birth again. However, 48 (82.8%) of them stopped attempting to become pregnant because they were afraid of recurrent CSP and the high risk of uterine rupture during the subsequent pregnancy. The other 10 women spontaneously attempted to become pregnant again; six of whom succeeded with the birth of seven healthy babies. All six of these women were previously treated by UAE combined with D&C for CSP.

A total of 32 women conceived again, either planned or by chance (Figure 1). The median time interval between previous CSP treatment and subsequent conception was 32 months (range 4–62 months). No miscarriage was reported. The above-mentioned six women had successful full-term cesarean deliveries. The median blood loss during subsequent CS operation was 450 mL (range

300–1000 mL). No placenta previa or placenta accreta was found. The remaining 26 women received induced abortion due to unwanted pregnancy. CSP was excluded via ultrasound before termination. Five women (15.6%) who experienced recurrent CSP were treated successfully with UAE combined with D&C without any severe complications. For the other 21 with intrauterine pregnancy, no excessive hemorrhage or other severe complication in abortion operation was reported. The characteristics of women with successful subsequent delivery and women with recurrent CSP are shown in Table 1.

Discussion

According to the results of our follow up, the recurrence rate of CSP was 15.6%. Moreover, this study showed that many women decided not to carry again merely because of fear of the recurrence of CSP. However, many women (60%) who wished and attempted to have babies after previous CSP managed to have a term pregnancy.

CSP is a rare iatrogenic complication with a rate of 0.15% in women with previous cesarean delivery and has an estimated incidence of 1/1800 to 1/2226 [1]. Over the past 10 years, the incidence of CSP has increased due to the increase in CSs, especially in China [4]. There are many CSP therapies that can preserve the uterus and subsequent fertility. However, there is still no consensus on the optimal management of CSP among obstetricians. This is partly because of the limited information about the likelihood of subsequent fertility and the risk of recurrent CSP after previous treatment. Although preserving fertility is one of the most important purposes of the treatment for CSP, there is still a chance of recurrence. This was the main concern of the women who wished to give birth again.

To date, few data on fertility or pregnancy after treatment for CSP have been reported. Seow et al [5] noted seven pregnancies (8

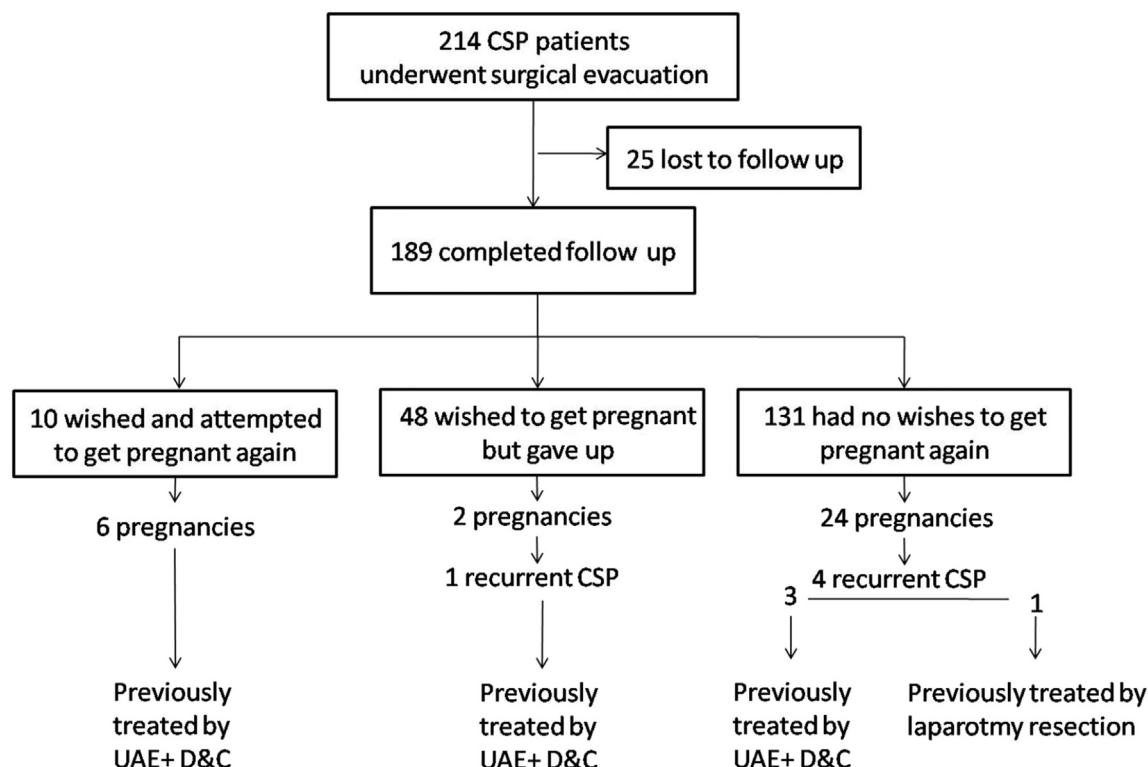


Figure 1. Distribution of pregnant women. CSP = cesarean scar pregnancy; D&C = dilation and suction curettage; UAE = uterine artery embolization.

Table 1

Characteristics of women with successful subsequent deliveries and women with recurrent CSP.

Case no.	Year	Previous CSP					Subsequent pregnancy			
		GnPn	CS (no.)	Age (y)	GA (wk)	Treatment	Interval (mo)	Outcome	Term (wk)	Management
1	2011	G ₅ P ₂₊₃	1	31	11 ⁺²	UAE + D&C	26	Full-term delivery	38 ⁺³	CS, birth weight: 3.75 kg
2	2011	G ₄ P ₂₊₂	1	30	8 ⁺¹	UAE + D&C	32	Full-term delivery	37 ⁺¹	CS, birth weight: 2.86/2.60 kg
3	2012	G ₄ P ₂₊₂	1	29	8	UAE + D&C	9	Full-term delivery	38 ⁺⁶	CS, birth weight: 3.15 kg
4	2013	G ₄ P ₂₊₂	1	34	8 ⁺⁴	UAE + D&C	15	Full-term delivery	38 ⁺²	CS, birth weight: 3.5 kg
5	2012	G ₆ P ₂₊₄	1	34	8 ⁺⁴	UAE + D&C	18	Full-term delivery	38 ⁺¹	CS, birth weight: 3.35 kg
6	2010	G ₆ P ₂₊₄	1	35	7 ⁺¹	UAE + D&C	13	Full-term delivery	37	CS, birth weight: 2.95 kg
7	2009	G ₄ P ₁₊₃	1	30	7 ⁺¹	UAE + laparotomy	62	Recurrent CSP	8 ⁺⁶	UAE + laparotomy
8	2009	G ₆ P ₂₊₄	2	30	6 ⁺⁴	UAE + D&C	64	Recurrent CSP	7 ⁺¹	UAE + D&C
9	2009	G ₈ P ₁₊₇	1	35	7 ⁺¹	UAE + D&C	20	Recurrent CSP	6 ⁺¹	UAE + D&C
10	2013	G ₅ P ₁₊₄	1	37	6 ⁺²	UAE + D&C	9	Recurrent CSP	7	UAE + D&C
11	2013	G ₇ P ₂₊₅	2	31	6 ⁺¹	UAE + D&C	12	Recurrent CSP	6 ⁺⁴	UAE + D&C

CS = cesarean section; CSP = cesarean scar pregnancy; D&C = dilation and suction curettage; GA = gestational age; UAE = uterine artery embolization; GnPn = Gravida and Para, which denote a state of pregnancy at the time of follow-up.

live and 1 dead babies) after conservative treatment of scar pregnancies. Wang et al [6] reviewed 32 cases of CSP treated with laparotomy/hysterotomy or medical treatment. Seven patients had subsequent pregnancies following treatment of CSP. Daeun et al [2] reported two successful live births following laparoscopic repair and one of preterm birth after exploratory laparotomy for symptomatic CSP. Qian et al [7] reported cesarean delivery history in rural community hospitals, thinner lower uterine segment, gestational sac bulging into the uterovesical fold, and presentation of positive symptoms as risk factors for recurrent CSP. Zhang et al [8] suggested surgical resection of CSP with repair of CS scar as an option that could reduce recurrence of CSP by removing the cesarean scar together with the pregnancy tissue. Meanwhile, none of the studies reported any information about the recurrence rate of CSP in subsequent pregnancy.

In our present study, the rate of repeated CSP was ~15.6% in our hospital, while the reported rate of primary CSP in women with previous CS was only 0.15%. Even though our result did not necessarily represent the true recurrence rate, these data might still provide some important information about recurrent CSP. A majority of patients diagnosed with CSP were referred to our hospital since it is one of the largest Grade A tertiary gynecological centers in Southwestern China. These patients comprised a large proportion of the population included in our study.

In the follow up, six women previously treated by UAE combined with D&C gave birth to seven healthy babies. The pregnancy rate was 60% in the group of women who willingly attempted to conceive again, with a live birth rate of 100%. All deliveries were full-term and performed successfully through planned CS with no postpartum complications. Of the five women with recurrent CSP, one was previously treated by UAE followed by laparotomy resection of CSP and repair of uterine scar defect, while the other four received combined therapy with UAE and D&C.

The combined therapy was considered to be effective in the treatment of CSP with a high success rate and reduced complication risk [9]. According to our study, UAE combined with D&C seemed to be safe in women who wanted to become pregnant again, since all the successful subsequent deliveries happened in the women previously treated with combined therapy. However, most of the repeated CSP also occurred in this group.

There were several limitations in our study. First, our study was observational. This outcome might be influenced by the treatment selection of the obstetricians in clinical work. Preventive UAE followed by D&C is the most favorable therapy for stable CSP in our hospital. After diagnosis was reached, the patient underwent extensive risk–benefit counseling, including a discussion of

alternative therapies and a review of the risks involved. Informed consent was obtained from all patients before treatment. Individualized management strategies were adopted, depending on specific conditions of each patient. Factors, such as hemodynamic status, gestational age, serum β -hCG level, ultrasonographic findings, and patients' request, were comprehensively considered. The most common primary treatments were UAE combined with D&C, followed by D&C alone. Second, since a large proportion of women were using birth control after previous CSP, the number of subsequent pregnancies was small in our study. Thus, the potential association between previous treatment, recurrent CSP, and successful subsequent delivery could not be further evaluated because of the study design and relatively small sample size. More prospective studies with large population are still needed.

In conclusion, we reported the first long-term follow up of reproductive outcomes after previous CSP treatment, with a recurrence rate of 15.6% and successful pregnancy rate of 60%. Our study provided some evidence about the likelihood of fertility and recurrence risk for future pregnancies after previous CSP.

Conflicts of interest

The authors report no conflict of interest.

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