

## Caesarean Scar Pregnancy: A Single Center Experience

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### ABSTRACT

**Objective:** To present the demographic and clinical characteristics and the treatment method of cases of caesarean scar pregnancy (CSP).

**Patients and Methods:** A retrospective examination was made of cases diagnosed with CSP at the tertiary reference hospital of Sütçü İmam University between January 2015 and December 2017. Data were retrieved related to the demographic characteristics of the patients, ultrasonography (USG) findings and treatment procedures.

**Results:** A total of 23 CSP cases were identified in the specified study period. The mean age of the patients was  $31.2 \pm 6.9$  years, mean gravida was  $4.4 \pm 1.7$ , mean gestational age was  $7.0 \pm 1.1$  weeks and the number of previous caesarean section (CS) deliveries was  $2.0 \pm 0.9$ . Intramuscular methotrexate (MTX) at a dose of 1mg/kg was applied to all the patients, then after 1 week, a dilatation and curettage (D&C) procedure. Before the MTX treatment, the initial serum beta-hCG value was determined as  $15813.1 \pm 12740.5$  IU/mL. The hemoglobin (Hb) level was determined as  $12.3 \pm 1.4$  before MTX treatment and  $11.4 \pm 0.6$ g/dL after the D&C procedure. Hysterectomy was not applied to any patient. CSP was determined at the rate of 8.0% of all ectopic pregnancies.

**Conclusion:** CSP, which has shown an increase in recent years in parallel with CS rates, may cause bleeding and serious complications even as far as maternal mortality. CSP cases in our clinic were successfully treated with a combination of systemic MTX followed by D&C.

**Key Words:** Ectopic pregnancy, caesarean scar pregnancy, methotrexate

### INTRODUCTION

Caesarean scar pregnancies (CSP) are defined as the implantation of early pregnancy material (blastocyte) in the caesarean scar line. The terms of caesarean section ectopic pregnancy or caesarean scar ectopic pregnancy are also used for CSP. Although ectopic pregnancy is seen rarely in women with previous CS deliveries at the rate of 1/1800-1/2500, there has been an increase in recent years in the number of patients diagnosed with CSP due to factors such as an increase in the number of CS deliveries, increased knowledge and experience of obstetricians and gynecologists on the subject of CSP and the more widespread use of trans-vaginal USG (TV USG). When the difficulties in diagnosis are considered and the likelihood that all cases have

not been reported, the rates of CSP could be higher [1, 2].

In addition to the increase in CS deliveries, changes in CS techniques are evaluated as factors leading to the increase in CSP rates. In recent years, there has been a preference for single-layer closure rather than double layer closure of the lower uterine segment (LUS) incision in CS. Compared to single-layer closure, in double-layer closure, as a second row of sutures is applied, the first layer is inverted, and better healing of the uterine incision has been reported. As this inversion does not occur in single-layer closure, the development of a defect in the scar line disrupting the healing of the incision, is therefore presumed to be a reason for increased risk of CSP [3].

**Received:** 25.01.2018,  
**Accepted:** 05.03.2018  
**DOI:** 10.5799/jcei.413062

Early diagnosis of CSP is important as delayed diagnosis can cause uterine rupture, massive hemorrhage and maternal mortality [1, 2]. Just as CSP patients may present with complaints of vaginal bleeding and/or abdominal pain, asymptomatic patients may be diagnosed during a routine USG examination. In diagnosis, USG and Doppler sonography are used primarily, and if necessary, magnetic resonance imaging (MRI). However, yet there is no consensus on the diagnostic criteria of CSP [4].

Although there is no consensus on the treatment for CSP, termination of the pregnancy prevents uterine rupture and massive hemorrhage and preserves fertility. An expectant approach applied to CSP cases significantly increases the risk of placenta accreta, severe hemorrhage and uterine rupture in the subsequent weeks of the pregnancy [1, 2, 5].

The aim of this study was to present the treatment method applied to cases of CSP in our clinic.

### PATIENTS and METHODS

A retrospective examination was made of cases diagnosed with CSP at the tertiary reference hospital of Sütçü Imam University between January 2015 and December 2017. Data were retrieved related to the demographic characteristics of the patients, the USG findings (Figure 1) and treatment procedures. All the patients diagnosed with CSP in our clinic were informed of the CSP treatment options, the risks and complications.

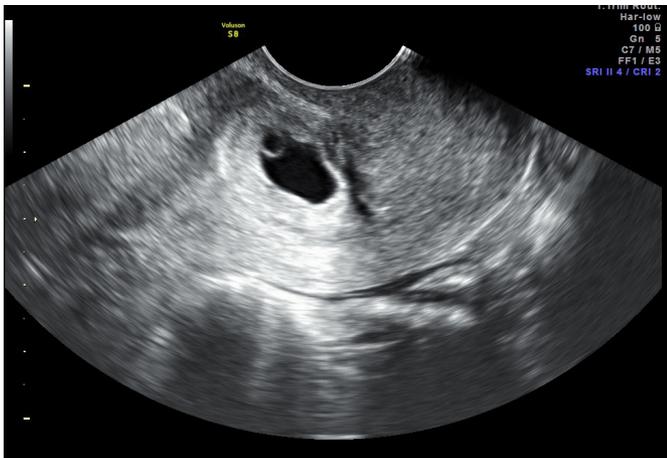


Figure 1. Pregnancy located on the caesarean scar line

Informed consent was obtained from patients with stable hemodynamics, normal hepatic and renal function tests and with no hematological abnormality, then 1 week after the application of a single dose of 1 mg/kg of intramuscular methotrexate (MTX), 4 units of erythrocyte suspension were prepared and dilatation and curettage (D&C) was applied under operating theatre conditions. Patients were discharged 1 day after the D&C procedure and were followed up at weekly intervals until the serum beta-human chorionic gonadotropin (hCG) value dropped to zero.

### RESULTS

A total of 23 CSP cases were identified in the study period of January 2015-December 2017. Two patients who rejected the methotrexate treatment protocol of our clinic and underwent hysterectomy were excluded from the study. The mean age of the patients was  $31.2 \pm 6.9$  years, mean gravida was  $4.4 \pm 1.7$ , mean gestational age was  $7.0 \pm 1.1$  weeks and the number of previous CS deliveries was  $2.0 \pm 0.9$ . There were complaints of vaginal bleeding in 8 (38.1%) cases and abdominal pain in 5 (23.8%) cases. The remaining 10 cases were asymptomatic and diagnosed during routine ultrasonographic examination. In 16 (76.2%) cases no embryo was observed in the gestational sac on USG examination and in 5 cases (23.8%), there was embryonic heart activity (Table 1).

Table 1. Demographic and clinical characteristics

	Study group (n=21)
Gravida, mean $\pm$ SD	$4.4 \pm 1.7$
Parity, mean $\pm$ SD	$2.3 \pm 1.0$
Age (years), mean $\pm$ SD	$31.2 \pm 6.9$
Gestational week, mean $\pm$ SD	$7.0 \pm 1.1$
Presence of embryonic heart activity on USG, n (%)	5 (23.8)
Number of previous caesarean section deliveries, mean $\pm$ SD	$2.0 \pm 0.9$
Vaginal bleeding, n (%)	8 (38.1)
Abdominal pain, n (%)	5 (23.8)

USG: Ultrasonography, SD: Standard deviation

Table 2. Values of serum beta human chorionic gonadotropin and pre-post treatment hemoglobin (mean  $\pm$  standard deviation)

Pre-treatment serum beta hCG value (IU/mL)	$15813 \pm 12740$
Pre-treatment Hb value (g/dL)	$12.3 \pm 1.4$
Hb value (g/dL) after D&C	$11.4 \pm 0.6$

hCG: beta human chorionic gonadotropin, D&C: Dilatation and curettage, Hb: Hemoglobin

A single dose of MTX was applied to all patients followed by a D&C procedure. Before the MTX treatment, the initial serum beta-hCG value was determined as  $15813.1 \pm 12740.5$  IU/mL. The hemoglobin (Hb) level was determined as  $12.3 \pm 1.4$  g/dL before MTX treatment and  $11.4 \pm 0.6$ g/dL after the D&C procedure (Table 2). Hysterectomy was not applied to any patient. In 3 cases who had low pretreatment hemoglobin levels, as the hemoglobin value was measured as  $<7$ gr/dL following the curettage, transfusion of two units of erythrocyte suspension was applied to each of these patients.

In the specified study period, a total of 185 cases of ectopic pregnancy were diagnosed in our clinic. CSP was determined at the rate of 8.0% of all the ectopic pregnancies.

## DISCUSSION

Caesarean scar pregnancy is one of the less commonly seen forms of ectopic pregnancy. CSP constitutes 6.1% of all ectopic pregnancies in cases with a history of CS delivery [1]. Together with increased rates of CS deliveries in recent years, an increase in CSP has been observed. In patients with a history of 2 or more CS, Jurkovic et al. [1] reported a rate of 72% CSP and Maymon et al. [3] found the rate to be 54%. In the current study patients, the mean number of previous CS was determined as 2.0.

Patients with CSP generally present with complaints of vaginal bleeding and/or abdominal pain. In the current study, 38.1% of the patients presented with abdominal pain and 23.8% with vaginal bleeding and the remaining 47.6% were asymptomatic. In a study of 112 patients, Rotas et al [6] reported that a third were asymptomatic and there was painless vaginal bleeding in 38%. Therefore, it is important to keep a diagnosis of CSP in mind when applying USG to pregnant patients with a history of CS even when there are no complaints.

Early diagnosis has a direct effect on the success of the treatment options. There is an increased risk of emergency hysterectomy in CSP cases after the first trimester [1, 5]. As yet, there is no consensus on the best treatment method for CSP. The treatment options can be listed as 1) medical treatment [systemic or local application or a combination of both], 2) D&C, 3) local resection with hysteroscopy, laparoscopy or laparotomy, 4) uterine artery embolization, 5) transvaginal hysterectomy, 6) hysterectomy, 7) expectant [watch and wait] method. In most cases, a combination of a few of these methods is used [2, 5-7].

MTX, which is a folic acid antagonist, prevents trophoblast division by preventing DNA synthesis. MTX has a wide area of use in the treatment of cervical and tubal ectopic pregnancies and was initially used in CSP as an adjuvant therapy to surgery such as hysterectomy. However, it later started to be used as a primary treatment option in early diagnosed CSP cases.

There are studies in literature reporting local and/or systemic use of MTX either alone or in combination in the treatment of CSP (5, 7-9). In a prospective study of 71 CSP cases by Wang et al [10], combined treatment (MTX followed by D&C) was applied to 50 cases and MTX alone was applied to 21 cases. While no significant difference was determined between the two groups in terms of treatment success, the estimated blood loss of the group applied with combined treatment was significantly lower and a shorter time was determined for the resolution of the pregnancy material. Sevketic, et al. reported that the treatment time of patients applied with D&C only was shorter than that of patients applied with MTX followed by suction curettage and the other clinical outcomes of the two treatment methods were similar [9].

Success rates for MTX in CSP treatment have been reported between 57% and 100%. Although there is no consensus on systemic or local use, the optimal dose, the number of applications, or what should be the need for repeated dose application and at what intervals, in systemic use a dose of 50 mg/m<sup>2</sup> has been reported to be effective in patients with serum beta-hCG <5000 IU/mL [7-9]. In the current study, all the patients were administered a systemic single dose of 1mg/kg MTX and no side-effects were determined. Neither were any complications determined related to the D&C procedure applied 1 week after the MTX treatment. However, limitations of this study are the low number of patients and that there was no control group to which MTX alone was applied or D&C alone.

Fertility rates after treatment are a very important parameter in the determination of treatment options for CSP cases who wish to retain fertility. Spontaneous intrauterine pregnancy following MTX treatment in tubal ectopic pregnancies has been reported as 73% [5]. As there were no long-term results for the patients in the current study, pregnancy rates following this CSP treatment could not be determined.

In conclusion, early diagnosis of CSP cases is of the utmost importance as a delay in diagnosis can lead to severe outcomes, even as far as maternal mortality. The patients in this study were successfully treated with a combination of MTX and D&C. There is a need for more extensive studies to define the optimum treatment protocol for CSP cases.

**Conflict of Interests:** The authors declare that they have no conflict of interest.

**Financial Disclosure:** No financial support was received

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