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# Cesarian Scar Ectopic Pregnancy: A Tertiary Maternity Hospital Case Series

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## Abstract

**Background and objective:** Higher rates of cesarean section nowadays were accompanied with increased incidence of cesarean scar ectopic pregnancy. The purpose of this study was to investigate the clinical characteristics, therapy and outcome of the caesarean scar ectopic pregnancies

**Methods**: A cross-sectional study implemented in the Maternity Teaching Hospital in Erbil city-Kurdistan region/Iraq through the period of one year from 1st of May 2022, to 30th of April 2023 on sample of 25 women with cesarean scar ectopic pregnancy. The cesarean section ectopic pregnancy was diagnosed in hospital according to history, clinical examination and ultrasonography findings. This study examined characteristics, history, diagnostics, management, and outcomes of pregnant women with cesarean scar ectopic pregnancy

**Results**: Mean age of the women was 31 years and 52% of them were obese. The presenting symptom of cesarean-section ectopic pregnancy among studied women was vaginal bleeding (52%), followed by missed periods (24%), pain & bleeding (16%) and only pain (8%). Common initial management of women with CSEP was medical treatment (76%), followed by combined treatment (16%) and surgical treatment (8%). The mean gestational age was significantly longer among women with cesarean scar ectopic pregnancy treated surgically, while shorter in women treated medically (p=0.001).

**Conclusions:** The risk factors of cesarean-section ectopic pregnancy are increased age, obesity, grand multi-gravidity, prior cesarean-sections and common presentation is vaginal bleeding at early gestational age.

**Keywords:** Cesarean section ectopic pregnancy, Initial management, Resolution

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## Introduction

There is increasing incidence rates of cesarean scar ectopic pregnancy.[1] The incidence rate of the cesarean scar ectopic pregnancy CSEP is about one in two thousand pregnancies globally, and rate of 0.15% among women with previous caesarean section and represented about 6.1% in all ectopic pregnancies.[2] The cesarean scar ectopic pregnancy (CSEP) is the rarest type of ectopic pregnancy.[2] However, increased rates of cesarean sections all over the world, was followed by CSEP.[3] The estimated incidence rate of CSEP in United Kingdom was approximately 0.015%.[4] In Iraq, the incidence rate of ectopic pregnancy was 0.22% and 30% of these ectopic pregnancies are related to previous cesarean section.[5,6] The caesarean scar ectopic pregnancy is a life-threatening condition if undiagnosed or left without treatment and might resulting in severe complications like severe bleeding and ruptured uterus that leads to hysterectomy, infertility or death.[7] High proportion of CSEP cases is a symptomatic. However, the common symptoms reported are first trimester pelvic pain and vaginal bleeding. The majority of women with symptomatic CSEP are presented clinically with light and painless vaginal bleeding, while some of them may presented with mild to moderate lower abdominal pain.[8] Common gestational age at CSPE diagnosis is between 5-16 weeks.[8] Studies suggest that cesarean scar ectopic pregnancies can be divided into two types. The endogenous type expands inward into the uterine cavity as the gestational sac grows, potentially leading to a viable pregnancy but with risks like placenta accreta and severe obstetric hemorrhage. The exogenous type extends outward toward the bladder, increasing the risk of scar rupture and intra-abdominal bleeding.[9] The diagnostic modality of choice for CSEP is transvaginal ultrasound (TVUS). The transabdominal ultrasound has also been used alone or combined with TVUS to improve diagnosis validity.[1] Selecting three-dimensional sonography of uterus is beneficial in exploring uterus pathology. The Magnetic resonance imaging (MRI) is helpful in diagnosis and evaluation of CSEP especially in difficult cases; however, the TVUS is more valid than MRI in CSEP.[10] Treatment plan of CSEP is including medical or surgical treatment, or both of them. The goal of CSEP management plans is aiming to preserve the women's fertility. Some women are managed by medical treatment plan through injecting anti-mitotic agent methotrexate. The potassium chloride is also injected instead of or in combination with methotrexate, especially in cases accompanied with fetal heartbeat. The combination of methotrexate with potassium chloride locally is highly effective embryocide which lowers risk of bleeding.[11] Regarding surgical intervention, some women are managed by removal of ectopic pregnancy by hysteroscopy, laparoscopy or laparotomy. Additionally, uterine artery embolization is sometimes used to prevent bleeding during curettages or hysteroscopies.[12,13] CSEP treatment is accompanied by high risk of bleeding particularly for women characterized by gestational sac is larger than 6 cm, anterior uterine wall is less than 0.2 cm thickness, systolic peak velocity is more than70 cm/s and resistance index is less than 0.35 measured by Doppler study.[14] The purpose of this study was to investigate at the characteristics, therapy and outcome of the caesarean scar pregnancies at a single tertiary center in Erbil City.

## Patients and methods

The current study was a cross-sectional study implemented in the Maternity Teaching Hospital in Erbil city-Kurdistan region/Iraq through the period of one year from 1st of May 2022, to 30th of April 2023. Inclusion


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criteria were Ultrasound findings of empty uterine cavity; closed and empty cervical canal, placenta &/or a gestational sac embedded in the scar of a previous Caesarean section and thin or absent myometrial layer between the gestational sac and the bladder. Exclusion criteria were tubal ectopic pregnancy, pregnancy of unknown location, ovarian ectopic pregnancy, cervical ectopic pregnancy, interstitial ectopic pregnancy, incomplete or missing patients' data and lost to follow up. The study was approved by the ethical committee of Kurdistan Higher Council of Medical Specialties, oral informed consent of women and management of any complications accordingly. Information of patients was collected retrospectively by researcher through a prepared questionnaire. The patients were identified at the time of their first check-up appointments which was usually 1 month after receiving treatment for CSEP. The questionnaire included general characteristics of pregnant women with CSEP, obstetrical and surgical history of women with CSEP, diagnostic features of women with CSEP and management and outcomes of women with CSEP. The cesarean section ectopic pregnancy was diagnosed by Senior Gynecologist in hospital according to history, clinical examination and ultrasonography findings. The decision of management was also done by Senior Gynecologist on call. After being identified each woman underwent a follow up period of 3 months through phone calls; and visitation appointments were planned at the end of each month to check for Beta Human Chorionic Gonadotropin (BHCG) resolution The researcher followed the women in duration of three months through phone calling and interview for checking the Beta Human Chorionic Gonadotropin (BHCG) resolution. The women's information was entered and interpreted statistically by SPSS program-version 26. Suitable statistical tests (One way ANOVA analysis test) for data were implemented accordingly and p value of ≤0.05 was significant.

## Results

This study included 25 women with cesarean section ectopic pregnancy (CSEP) presented with mean age of (31 years) and range of 20-42 years; 40% of women were in age group 20-29 years, 36% of them were in age group 30-39 years and 24% of them were in age group of 40-42 years. The mean body mass index of women with CSEP was (30.6 $Kg/m^2$); 36% of them were overweight and 52% of them were obese. Table (1).

**Table (1):** General characteristics of women with CSEP.

| Variable | No. | % |
|---|---|---|
| Age mean±SD (31±6.4 years) | | |
| 20-29 years | 10 | 40.0 |
| 30-39 years | 9 | 36.0 |
| 40-42 years | 6 | 24.0 |
| Body mass index mean±SD (30.6±5.1 $Kg/m^2$) | | |
| Normal | 3 | 12.0 |
| Overweight | 9 | 36.0 |
| Obese | 13 | 52.0 |
| Total | 25 | 100.0 |

The grand-multigravidity was the prevalent gravidity history of women with CSEP (56%), while the multiparity was the prevalent parity history of them (80%). Mean gestational age of women with CSEP was (6.3 weeks); 64% of them were presented at 3-6 weeks of gestation. Mean number of prior cesarean sections was (2.4); 68% of women with CSEP had prior 1-2 CSs and 32% of them had 3-4CSs. The past surgical history of women with CSEP was negative in 56% of them, while positive history was commonly dilation & curettage (40%). Mean interval between last CS and current pregnancy was (2.6 years); 64% of women had interval of 2 years and more, Table (2).


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**Table (2):** Gestational and surgical history of women with CSEP.

| Variable | No. | % |
|---|---|---|
| Gravidity | | |
| Gravida 3-4 | 11 | 44.0 |
| Gravida ≥5 | 14 | 56.0 |
| Parity | | |
| Para 1-4 | 20 | 80.0 |
| Para ≥5 | 5 | 20.0 |
| Gestational age mean±SD (6.3±1.2 weeks) | | |
| 3-6 weeks | 16 | 64.0 |
| 7-9 weeks | 9 | 36.0 |
| Number of prior cesarean section mean±SD (2.4±0.9) | | |
| 1-2 CSs | 17 | 68.0 |
| 3-4 CSs | 8 | 32.0 |
| Past surgical history | | |
| No | 14 | 56.0 |
| Myomectomy | 1 | 4.0 |
| Dilation & curettage | 10 | 40.0 |
| Interval between last CS and current pregnancy mean±SD (2.6±1.7 years) | | |
| <2 years | 9 | 36.0 |
| ≥2 years | 16 | 64.0 |
| Total | 25 | 100.0 |

The presenting symptom of CSEP among studied women was vaginal bleeding (52%), followed by; missed periods (24%), pain & bleeding (16%) and only pain (8%). The cardiac diagnosis was positive in 16% of women with CSEP. Mean BHCG level of women with CSEP was (14121.5 IU); 72% of women had normal BHCG level, while 4% of them had low BHCG and 24% of them had high BHCG level, Table (3).

**Table (3):** Diagnostic features of women with CSEP.

| | No. | % |
|---|---|---|
| Presenting symptom | | |
| Vaginal bleeding | 13 | 52.0 |
| Pain | 2 | 8.0 |
| Pain & bleeding | 4 | 16.0 |
| Missed period | 6 | 24.0 |
| Cardiac activity diagnosis | | |
| Yes | 4 | 16.0 |
| No | 21 | 84.0 |
| BHCG level mean±SD (14121.5±1837 IU) | | |
| Low | 1 | 4.0 |
| Normal | 18 | 72.0 |
| High | 6 | 24.0 |
| Total | 25 | 100.0 |

Common initial management of women with CSEP was medical treatment (76%), followed by combined treatment (16%) and surgical treatment (8%). The further management required only in
16% of women with CSEP that was related to increased BHCG level. The BHCG was on resolution in 96% of women with CSEP after management, while only one woman had no resolution. The mean time on resolution was (35 days); 52% of women had more than one month time on BHCG resolution, Table (4).

**Table (4):** Management and outcomes of women with CSEP.

| Variable | No. | % |
|---|---|---|
| Initial management | | |
| Medical | 19 | 76.0 |
| Surgical | 2 | 8.0 |
| Combined | 4 | 16.0 |
| Further management required | | |
| Yes | 4 | 16.0 |


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| | | |
|---|---|---|
| No | 21 | 84.0 |
| Reasons for secondary management | | |
| Increased BHCG level | 4 | 100.0 |
| BHCG on resolution | | |
| Yes | 24 | 96.0 |
| No | 1 | 4.0 |
| Time on resolution mean±SD (35±20.7 days) | | |
| Within one month | 12 | 48.0 |
| More than one month | 13 | 52.0 |
| Total | 25 | 100.0 |

No significant differences in management options regarding women's age (p=0.2), body mass index (p=0.2), gravidity (p=0.4), number of prior cesarean sections (p=0.38), interval between current pregnancy and last cesarean section (p=0.18) and BHCG level at first diagnosis (p=0.9). The mean gestational age was significantly longer among women with CSEP treated surgically, while shorter in women treated medically (p=0.001), Table (5).

**Table (5):** Distribution of management options according to study variables.

| Variable | Initial management | | | p-value |
|---|---|---|---|---|
| | Medical | Surgical | Combined | |
| | Mean±SD | Mean±SD | Mean±SD | |
| Age (years) | 31±6.1 | 25.5±7.7 | 35±6.5 | 0.2 NS |
| BMI (Kg/m$^2$) | 29.7±4.8 | 35.8±7 | 32.1±5.1 | 0.2 NS |
| Gravida | 4.8±1.6 | 6.5±3.5 | 4.7±1.2 | 0.4 NS |
| Gestational age (weeks) | 5.9±0.8 | 9±1.4 | 6.2±0.5 | 0.001 S |
| No. of prior CSs | 2.4±0.8 | 1.5±0.7 | 2.5±1.2 | 0.38 NS |
| Interval between pregnancy and last CS (years) | 2.5±1.6 | 4.7±1.7 | 1.8±0.3 | 0.18 NS |
| BHCG level (IU) | 14891.1±1939.9 | 8840.5±7107.1 | 13106.2±2148.6 | 0.9 NS |

NS=Not significant, S=Significant.

## Discussion

In present study, mean age of women with CSEP was (31 years). This mean age is close to mean age of (30.31 years) for women with CSEP reported in Mohapatra et al.'s retrospective review study.[15] Mean body mass index of women with CSEP in our study was (30.6 Kg/m$^2$); 36% of them were overweight and 52% of them were obese. There are no prior studies that have commented conclusively about the relationship between BMI and cesarean scar pregnancy (CSP). However, our finding can be supported by Antila-Långsjö et al.'s study, in which they discovered that an increasing BMI raises the risk of developing isthmocele (scar defect) which could explain the increased rate of overweight and obese women among our CSEP patients. [16] The


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grand multigravidity history in current study was prominent in pregnant women with CSEP (56%). The krallah et al. stated that multi-parity increased incidence and complications of cesarean section. [17] Our study found that mean gestational age of women with CSEP was (6.3 weeks); 64% of them were presented at 3-6 weeks of gestation. This finding is parallel to reports of Kaliamoorthi et al's study, in which they reported that women with CSEP commonly presented within 5 to 12 weeks of gestation. [18] Our study found that 68% of women with CSEP had prior 1-2 CSs and 32% of them had 3-4CSs. These findings are in agreement with results of Mishra et al's study, in which they found that CSEP reported for 52% of cases after 1 CS, 36% after 2 CSs and 12% after 3 or more CSs. [19] The past surgical history was positive among 44% of studied women with CSEP, especially dilation & curettage. This finding is similar to results of Vial et al. study in Switzerland which reported that prior dilation and curettage is a risk factor for CSEP. [20] The mean interval between last CS and current pregnancy was (2.6 years); 36% of women had interval of less than 2 years. Consistently, Tjokroprawiro et al. found that shorter interval between last CS and current pregnancy is accompanied by adverse complications. [21] Current study showed that presenting symptom of CSEP among studied women was vaginal bleeding (52%), followed by; missed periods (24%), pain & bleeding (16%) and only pain (8%). These findings are similar to results of Torky's study.[22] Boza et al. reported that common presenting symptom of CSEP was painless vaginal bleeding at earlier weeks of gestation with prior history of CS. In our study, the cardiac diagnosis was positive in 16% of women with CSEP and 24% of them had high BHCG level. These findings are close to results of Boza et al. study in Turkey which found positive fetal cardiac diagnosis and high BHCG level in small proportion of pregnant women with CSEP. [23] In current study, common initial management of women with CSEP was medical treatment (76%), followed by combined treatment (16%) and surgical treatment (8%). These findings are in agreement with results of Agrawal et al. single center study in India which revealed that medical treatment is the common management way of CSEP which might be combined with or replaced by surgical treatment according to hemodynamic status of women. [24] Further management was required in 16% of studied pregnant women with CSEP due to increased BHCG level. This finding is consistent with reports of Glenn et al. literatures review study in United States of America which documented that further medical or surgical treatment is required in some pregnant women with CSEP after medical treatment due to failed BHCG level reduction. [25] In our study, the BHCG was on resolution in 96% of women with CSEP after management, while only one woman had no resolution. Similarly, Malhotra et al. found a decline in BHCG level in majority of pregnant women with CSEP after initial management. [26] In present study, mean time of BHCG resolution was (35 days). This finding is better than results of Younes et al.'s study, in which they reported that mean BHCG resolution time was (56 days). [27] Present study found that mean gestational age was significantly longer among women with CSEP treated surgically, while shorter in women treated medically (p=0.001). This finding is parallel to results of Jameel et al.'s study, in which they found that earlier gestational age at CSEP diagnosis is medically managed with better prognosis.[28] In conclusion, the risk factors of cesarean section ectopic pregnancy are increased age, obesity, grand multi-gravidity, prior cesarean sections and common presentation is vaginal bleeding at early gestational age. Initial management of cesarean section ectopic pregnancy is


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medical treatment that monitored by resolution of BHCG level.

## Conclusions

The risk factors of cesarean-section ectopic pregnancy are increased age, obesity, grand multi-gravidity, prior cesarean-sections and common presentation is vaginal bleeding at early gestational age.

## Conflicts of interest: None

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