CESAREAN SCAR ECTOPIC PREGNANCY IN RELATION TO PREVIOUS OBSTETRICAL HISTORY

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ABSTRACT

Background

Cesarean scar ectopic pregnancy (CSEP) is the implantation of a gestational sac inside the scar of a previous cesarean section (C/S). CSEP is a life-threatening condition that needs early management.

Objectives

The study aimed to know the associations between CSEP and previous obstetrical history.

Patients and Methods

Twenty-seven women with CSEP who were admitted to the Sulaimani Maternity Teaching Hospital from September 2019 to October 2021 were collected for this cross-sectional study. Complete obstetrical history, clinical features, the interval between the last C/S and CSEP, mode of diagnosis, and types of management were recorded.

Results

The mean of maternal age, gravidity and parity were 32.14±4.63 years (range, 24 to 40 years), 3.73±1.75 (range, 1 to 8) and 2.36±1.33 (range, 1 to 6), respectively. The majority (74.1%) had no significant medical diseases. The mean interval between the last C/S and CSEP was 2.6±1.8 years, and 92.6% complained of vaginal bleeding. The association of gravidity with CSEP presentation was statistically significant. Only 22.2% had a history of one prior C/S alone; however, 74.1, 14.8%, and 3.7% of patients had two, three, and four previous C/Ss, respectively. Besides, the associations of first and second C/Ss with obstetricians' experience who performed the C/Ss were statistically significant.

Conclusion

The risk of CSEP increases when the frequency of gravidity and previous C/S increases.

Keywords: *Cesarean section; Ectopic pregnancy; Scar ectopic.*

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INTRODUCTION

Ectopic pregnancy is a pregnancy that develops outside the uterine cavity [1]. An ectopic pregnancy occurs in about 2% of all pregnancies and 6% of all pregnancy-related death [2]. The most common clinical feature is abnormal vaginal bleeding and pelvic pain during early pregnancy [2]. Ectopic pregnancy risk factors include prior ectopic pregnancy, assisted reproductive methods, increased maternal age, tubal ligation, prior cesarean section (C/S), intrauterine device (IUD), and sexually transmitted infections [3]. The most common site for ectopic pregnancy is the ampulla of the fallopian tube; however, it can occur in the myometrium, cervix, ovaries, or inside the abdominal cavity [2].

Cesarean scar ectopic pregnancy (CSEP) is a rare type of ectopic pregnancy, and it was first described in 1978 by Larsen et al. [4]. In the CSEP has become a serious issue over the last few years because of the increasing C/S risks and C/S rates due to maternal requests [5]. Besides, it is defined as the implantation of the gestational sac inside the myometrial defect in the uterine incision of prior C/S [5]. Further, due to the rise in the rate of doing C/S and the broad usage of transvaginal ultrasonography, the incidence of CSEP has rapidly increased [6]. The incidence of CSEP is 1:2226 to 1:1800, which is about 6% of all ectopic pregnancies [7]. CSEP is life-threatening because it can lead to uterine rupture and maternal haemorrhage [8]. Previous research found few risk factors for CSEP, such as breech presentation, history of endometrial and muscular damage during dilation and curettage (D&C), in vitro fertilization (IVF), adenomyosis, manual removal of placenta (MROP), and surgical methods [6].

There are two main types of CSEP [6]:

1- Endogenous type: the CSEP grows into the uterine cavity and has a potential risk of placenta accreta; thus, major haemorrhage.

2- Exogenous type: the CSEP grows into the outside with the potential of uterine rupture at the scar site, causing intra-abdominal haemorrhage.

Therefore, diagnosing the CSEP as early as possible is essential to decrease associated complications [6].

Although few reports and studies have been performed about the pathogenesis and aetiology of CSEP, its exact cause is still unclear until now [9]. Besides, if not diagnosed early, there are no unique clinical features at an early stage of the disease until serious complications occur, like haemorrhage and death [9]. Also, there is no global agreement on its management due to its rarity; therefore, individualized treatment options should be offered [9].

The current study aimed to know the association between CSEP with obstetrical history.

PATIENTS AND METHODS

This cross-sectional study was performed on 27 women afflicted with CSEP and admitted to the Sulaimani Maternity Teaching Hospital from September 2019 to October 2021.

The inclusion criteria included women with an ectopic pregnancy at the site of a previous C/S scar. The exclusion criteria included women with ectopic pregnancies other than the site of previous C/S scar.

Complete obstetrical and gynaecological histories and demographic features were recorded, including maternal age, residency, educational level, parity, and gravidity. In addition, clinical features at the time of presentation, previous history of D&C, numbers of previous C/S, and the interval between the last C/S and scar ectopic were recorded. Also, the mode of diagnosis, including transabdominal and transvaginal ultrasonography, and types of management were recorded.

The "IBM SPSS Statistics version 26" software was used to analyze the data, and descriptive and inferential statistics were used. Further, a P-value of ≤ 0.05 was considered a statistically significant association. Also, Pearson Chi-Square was used to determine the significance of the association between categorical independent and dependent variable pairs.

The Kurdistan Higher Council of Medical Specialties (KHCMS) approved the study proposal (No. 178, Feb 3, 2020), and a formal acceptance letter was obtained from Sulaimani Maternity Teaching Hospital before starting the study. Also, written informed consent was taken from the patients to participate in the study.

RESULTS

The mean±SD (standard deviation) of maternal age was 32.14±4.63 years (24 to 40 years). The mean±SD of gravidity, parity, miscarriage, and dead babies were 3.73 ± 1.75 (range, 1 to 8), 2.36 ± 1.33 (range, 1 to 6),

0.36 ± 0.73 (range, 0 to 3), and 0.14 ± 0.47 (0 to 2), respectively. The demographic characteristics of the patients are shown in (Table 1).

Most patients (77.8%) had no significant medical diseases (Table 2). In addition, all the women had a history of lower segment incision for their C/S(s), and only two (7.4%) women had a history of D&C; one woman had a history of one D&C, and the other woman had a history of two (Table 2). Further, the mean±SD interval between the last C/S and CSEP was 2.6±1.8 years (one month to eight years).

Although the associations of history of parity and abortion with CSEP presentation (mode of diagnosis) were statistically insignificant, this association was statistically significant for gravidity; when gravidity increased, the diagnosis of CSEP was only by routine ultrasonic checkups (Table 3).

All the patients (100%) had a history of at least one previous C/S (only six,22.2% had a history of one prior C/S alone); however, sixteen (74.1%), four (14.8%), and one (3.7%)patient(s) had a history of two previous C/Ss, three previous C/Ss, and four previous C/Ss respectively, (Tables 4).

Table 1. Demographic characteristics of the patients.

Demographic characteristics		Frequency	Percent
Age groups (year)	24 - 29	8	29.6
	30 - 34	9	33.3
	35 - 40	10	37.1
Educational level	Illiterate	4	14.8
	Primary school	10	37.1
	Secondary school	9	33.3
	Preparatory school	3	13.6
	University or institute	1	4.6
Residency	Rural	5	18.5
	Suburban	2	7.4
	Urban	20	74.1
Parity	1-2	13	48.2
	3-4	12	44.4
	≥5	2	7.4
Total		**27**	**100**

Table 2. The patients'Obstetric characteristics and outcomes.

Disease characteristics and maternal outcome		Frequency	Percent
Past medical history	None	21	77.8
	Hypertension and DM	5	18.5
	Hypertension	1	3.7
Presenting symptoms of CSEP	Vaginal bleeding	25	92.6
	Missed period	1	3.7
	Abdominal pain	1	3.7
Number of previous C/S(s)	1	7	25.9
	2	16	59.3
	3	4	14.8
	4	1	3.7
Previous history of D&C	Yes	2	7.4
	No	25	92.6
Mode of CSEP diagnosis	Emergency symptoms by transvaginal U/S	10	37
	Routine checkup by U/S	17	63
Types of management	Transcervical aspiration of the gestational sac	15	55.6
	Open surgery	6	22.2
	Methotrexate and transcervical aspiration of the gestational sac	4	14.8
	Methotrexate	2	7.4
Maternal outcome	Healthy and alive	26	96.3
	Uterine rupture	1	3.7
Total		**27**	**100**

CSEP = cesarean scar ectopic pregnancy; D&C = dilatation and curettage; DM = diabetes mellitus; DVT = deep venous thrombosis; U/S = ultrasonography

Table 3.Associations of obstetrical history with modes of CSEP diagnosis.

Obstetrical history		Mode of CSEPdiagnosis (%)			P-values
		Emergency symptoms by transvaginal U/S	Routine checkup by U/S	Total	
Gravidity	**1-2**	1 (3.7)	4 (14.8)	5 (18.5)	
	3-4	7 (25.9)	7 (25.9)	14 (51.9)	0.022
	≥5	0 (0)	8 (29.6)	8 (29.6)	
Parity	**1-2**	7 (25.9)	6 (22.2)	13 (48.2)	
	3-4	1 (3.7)	11 (40.7)	12 (44.4)	0.251
	≥5	0 (0)	2 (7.4)	2 (3.7)	
Miscarriage	**0**	6 (22.2)	13 (48.8)	19 (70.4)	
	1	2 (7.4)	5 (18.5)	7 (25.9)	0.738
	3	0 (0)	1 (3.7)	1 (3.7)	
Total		**8 (29.6)**	**19 (70.4)**	**27 (100)**	**—**

CSEP = cesarean scar ectopic pregnancy; U/S = ultrasonography

Table 4.Associations of C/Sswith the obstetricians' experience who performed the C/Ss.

C/Ss		Performance of C/Ss (%)		Total (%)	P-values
		Sutured by registrar	Sutured by a senior obstetrician		
Previous one c/s	Elective C/S	3 (11.1)	17 (63)	20 (74.1)	**0.005**
	Emergency C/S	7 (25.9)	0 (0)	7 (25.9)	
Total		10 (37)	17 (63)	27 (100)	
Previous two c/s	Elective C/S	2 (7.4)	12 (44.4)	14 (51.9)	**0.025**
	Emergency C/S	6 (22.2)	0 (0)	6 (22.2)	
Total		8 (29.6)	12 (14.4)	20 (74.1)	
Previous three c/s	Elective C/S	3 (11.1)	0 (0)	3 (11.1)	**0.178**
	Emergency C/S	1 (3.7)	0 (0)	1 (3.7)	
Total		4 (14.8)	0 (0)	4 (14.8)	
Previous four c/s	Elective C/S	0 (0)	1 (3.7)	1 (3.7)	**0.249**
	Emergency C/S	0 (0)	0 (0)	0 (0)	
Total		0 (0)	1 (3.7)	1 (3.7)	

C/S = cesarean section; U/S = ultrasonography

DISCUSSION

Cesarean scar ectopic pregnancy (CSEP) is a rare ectopic pregnancy [10]. The precise pathophysiology of CSEP is not identified yet; however, the most accepted theory is the occurrence of scar dehiscence or defects at the scar secondary to vascularization deficiencies and fibrosis that compromise healing [11]. Four theories have been hypothesized for the pathophysiology of CSEP [10]; first: low or cervical uterine incision; second: inadequate closure of the uterus wall; third: the surgical procedures that may cause adhesions; four: patient factors that may decrease wound healing.

In the current study, all the women had at least one previous C/S; however, most (74.1%) had at least two previous C/Ss. Also, all the women in the current study had a history of lower segment incisions for their prior C/S(s). Therefore, the current study's lower segment incision for prior C/Sssu supports the first theory of CSEP pathophysiology occurrence.

In the current study, the number of pregnant women with CSEP significantly increased and was diagnosed by routine checkups by abdominal U/S when their gravidity increased. Therefore, the precedent findings are likely related to the increased awareness of women when the frequency of their gravidity increases. Thus, most elective patients had been operated on by a senior obstetrician; however, the emergent cases were operated on by a registrar obstetrician.

As there are two types of CSEP, endogenous and exogenous, the clinical features of patients with CSEP are nearly the same as cervical and tubal ectopic pregnancies [12]. Only one patient afflicted with a ruptured uterus presented with abdominal pain alone in the current study; however, most (92.6%) presented with abnormal vaginal bleeding. Also, one woman diagnosed by routine checkup by U/S presented with a missed period, and the interval between the prior C/S was only a month. Thus, most of the CSEP was the endogenous type.

The CSEP is a precursor for a morbidly adherent placenta, and a morbidly adherent placenta is an obstetrical complication that occurs by an invasion of the myometrium by the placenta [13]. Therefore, Shamshiraz et al. [14] and Timor-Tritsch et al. [13] suggested elective cesarean hysterectomy without removing the placenta to decrease maternal morbidities. However, suction and aspiration of the CSEP for the first and second CSEP and laparotomy to excise the prior scar and repair the uterine wall for the third CSEP had been mentioned in the literature [15]. Most (70.4%) of the patients in the current study had been managed by transcervical aspiration of the gestational sac. Open surgeries had been used to manage only 22.2% of the patients, and the remainder had been managed either by transcervical aspiration of the gestational sac and methotrexate (14.8%) or methotrexate alone (7.4%).

There is no uniform guideline for managing CSEP, and previous studies mentioned different approaches, such as elective cesarean hysterectomy [13], aspiration of the CSEP [15], intragestational injection of methotrexate with or without KCL [15], and systemic methotrexate [16]. Therefore, different, less invasive, and patient-tailored methods were used in the current study.

In conclusion, the risk of CSEP increases when the frequency of gravidity increases. Therefore, women should be advised that doing more C/Ss increases the risk of CSEP. However, doing C/Ss by experienced obstetricians decreases the risk of CSEP.

Conflict of interest

The authors declare no conflict of interest.

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