Original Article

Diagnostic Challenges and Management Options of Caesarean Scar Pregnancy in a Tertiary Care Hospital of Bangladesh

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Abstract

Background: The incidence of cesarean section (CS) is on an expanding trend and that is why the incidence of Cesarean Scar pregnancy (CSP) Is also increasing day by day. Failure to confirm diagnosis and initiate immediate management of Cesarean scar pregnancy (CSP) may lead to uterine rupture, massive hemorrhage and even maternal death.

Objective: To determine clinical presentations and different options of management of scar pregnancy in CMH, Dhaka.

Methods: A final diagnosis of cesarean scar pregnancy was made during this observational study, which was conducted in the Obstetrics and Gynecology department of the Combined Military Hospital in Dhaka from July 2024 to June 2025. From 49 CSP patients, extensive clinical, laboratory, and radiographic data were collected. Age, gravidity, parity, number of prior cesarean sections, history of dilation and evacuation (D&E), history of abortifacient intake, presenting complaints, serum beta-HCG levels, sonographic features, and need for blood transfusions were among the clinical and demographic characteristics that were analyzed in relation to treatment modalities.

Results: During the one –year period, there were a total 49 cases of CSP. The mean age of the women in the study was 32. 8years.The previous history of 1 D&C was seen in 44.89% patients. One prior CS was present in the majority of instances (48.98%). The median duration from the last CS was 2 years and history of abortifacient intake in present pregnancy was notably present in 67% of the patients. The mean gestational sac diameter was 8.2±1.06 mm while mean myometrium thickness between the bladder and gestational sac was 2.2±1.18 mm. Vascularity was mild in twenty five and severe in thirteen cases. The mean serum beta-HCG level at presentation was 5036±386.46 miu /ml. Laparotomy with a wedge excision of the scar and trophoblastic tissue, followed by uterine repair, was used to surgically handle the majority of the patients, around 27 out of 49.

Conclusion: The early detection of CSP is crucial for minimizing complications and ensuring effective care. Suction and evacuation can be used to effectively manage patients with low beta HCG and early gestational age. Laparotomy and scar pregnancy excision can be performed on patients with greater beta HCG levels and earlier gestational ages.

The probability of scar ectopic pregnancy should be fully understood by the obstetrician and radiologist, particularly in situations involving myomectomy and prior cesarean sections. Management of cesarean scar pregnancy is challenging because there is no specific treatment option and management guideline for cesarean scar pregnancy.

Keywords: Cesarean section, Dilation and evacuation, Ectopic, Myomectomy, Scar ectopic pregnancy, Ultrasonography, Methotrexate

Introduction:

Scar pregnancy is defined as a gestation located within the myometrium of a prior scar.[1] This is increasing due to a higher number of surgical procedures, particularly cesarean sections. Scar ectopic pregnancy after cesarean section is an uncommon type of ectopic pregnancy in which the gestational sac adheres to the fibrous tissue scar from a prior cesarean delivery. The prevalence of ectopic pregnancy is 6.1% of all pregnancies, while the incidence of cesarean scar pregnancy (CSP) is 0.14%.[2,3]

In addition to implanting in the scar from a cesarean section, scar pregnancy can also be discovered in the uterine scar from a myomectomy or a perforation that occurred during dilation and evacuation. Intra myometrium one of the rarest forms of ectopic pregnancy is ectopic pregnancy in the myometrium, which accounts for less than 1% of all occurrences.[4] One of the most popular delivery methods nowadays is the lower segment cesarean section (LSCS).[5] The percentage of cesarean deliveries in several nations has risen from 21.8 to 25.4%.[6] The primary issue with scar pregnancy is that the placenta adheres to a preexisting scar that has already thinned out, increasing the risk of PAS disorder, which can occasionally affect the bladder. This attachment causes the scar to gradually thin, which eventually stops as the pregnancy goes on, resulting in spontaneous uterine rupture and potentially fatal complications. Therefore, to prevent the difficulties caused by scar pregnancy, early identification and targeted treatment options are required.

Materials and Methods:

A retrospective observational study was conducted in the Department of obstetrics and gynecology, Combined Military Hospital, Dhaka, between July 2024 to June 2025. Total 49 cases of CSP were diagnosed during this period who attends at CMH, Dhaka. A distinct gestational sac with or without heart activity buried in the anterior myometrium or fibrous tissue of the scar at the level of the isthmus with peril-trophoblastic vascularity was one of the diagnostic criteria on ultrasonography (USG), along with an empty uterine cavity and an empty cervical canal. Myometrium thickness between the bladder and gestational sac was also noted. Those who peroperatively diagnosed CSP without any USG, are also included in this study Comprehensive clinical presentation, diagnostic modalities, management strategies and outcome were analyzed In this study. Clinical and demographic characteristics, such as age, gravidity, number of prior CS, history of dilatation and evacuation (D&E), history of abortifacient intake, presenting complaints, serum beta-HCG level, sonographic feature, and need for blood transfusion, were analyzed in relation to treatment modalities. This study did not include any other forms of ectopic pregnancy.

Results:

The mean age of patients with the final diagnosis of CSP was 32.68+3.78 years with gravidity and parity of 2.8+.37 and 1.87+0.58, respectively. The previous history of one D&E was seen in this study in 44.89%.

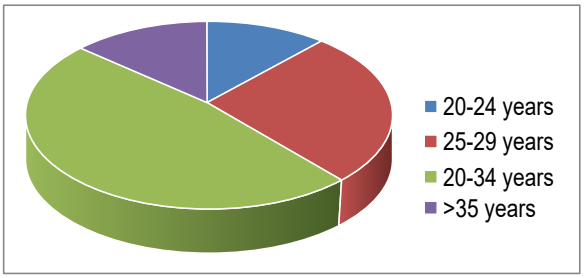

Figure-1: Age distribution of the study

Table-I: Distribution of study patients as per gravida and parity

Variables	Number	Percentage
Gravida		
Gravida 2	16	32.65
Gravida 3	12	44.89
≥Gravida 4	11	22.46
Study patients as per parity		
1	25	51.02
2	18	36.73
≥3	6	12.25

Table-II: Distribution of the study patients as per no of CS and duration from the last caesarian section

Variables	Number	Percentage
Study patients as per no of CS		
1 LSCS	24	48.98
2 LSCS	20	40.53
≥3 LSCS	5	10.49
Duration from the last caesarian section		
<2	20	40.82
≥2	29	59.18

Table-III: History of abortifacient intake in this pregnancy and no of D&C

Intake	Number	Percentage
Yes	29	67
No	20	33
Number of D&C		
One time	15	30.61
Two time	7	14.28
no	27	55.10

More than one D&C in 22.46% of patients. The majority (48.98%) of cases had previous one CS. The median duration from the last CS was 2 years. History of abortifacient intake in present pregnancy was notably present in 67% of patients. Patients were not sure about the indication of CS and there were no documented operative notes available to analyze the indication of CS and techniques for the closure of uterus.

Table-IV: Period of gestation (weeks), Initial diagnosis on first USG and Presenting complaints

Variables	Number	Percentage
Period of gestation		
6-8	26	53.06
8-9	20	40
>9	03	6.122
Mean±SD	8.2±1.06	
Initial diagnosis on first USG		
Incomplete abortion/Missed abortion	21	42.85
Early intrauterine pregnancy	10	20.42
Scar pregnancy	16	32.65
Cervical pregnancy	02	4.08
Presenting complaints		
Pain abdomen	07	14.28
Mild p/v bleeding	20	40.81
Severe p/v bleeding	12	24.45
Asymptomatic	10	20.41

The median gestational age at presentation was 8.2 ± 1.06 weeks. The most common presenting complaint was mild vaginal bleeding seen in twenty patients (40.81%) out of 49 cases followed by pain abdomen in 07 (14.2%)of patients and severe p/v bleeding in 12(20.45%). Only one-third of the patients were diagnosed as CSP in their first USG while two-thirds had a delayed or incorrect diagnosis before presenting. On earlier USG, 11 cases were diagnosed as missed abortion, 10 as early intrauterine pregnancies, and two as cervical pregnancies and 16 scar pregnancy. 11 patients had D&E done in their present pregnancy for a spurious diagnosis before presenting. However, except one case in 10 cases there were torrential bleeding during D&E and a diagnosis of CSP could be made only preoperatively, the rest of the patients were diagnosed correctly as CSP on repeat USG.

Table-V: Ultra sonographic feature/MRI Mean gestational sac diameter

Variables	Number	Percentage
Sac size (mm)		
10-15	20	40.81
16-20	13	26.53
>20	O5	10.20
Mean±SD	16.75±2.01	
Fetal cardiac activity (Among 38 patient)		
Present	04	10.52
Absent	34	89.47
Myometrial thickness between bladder and myometrial wall		
No residual myometrium	10	26.315
2-4	18	47.36
>5	10	26.31
Mean±SD	4.6±0.47	

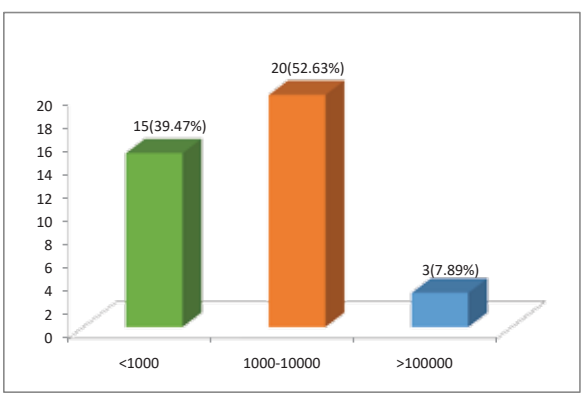

Figure-2: Serum b HCG level mIu/ml before treatment

Table-VI: Management option of study population

Management option	Number	Percentage
Systemic MTX (single dose)	24	48.97
Systemic MTX followed by scar excision and uterine repair	14	28.57
Evacuation and curettage	04	8.16
Hysterectomy	08	16.32
Scar excision followed by uterine repair, during preoperatively diagnosed CSP	13	26.53

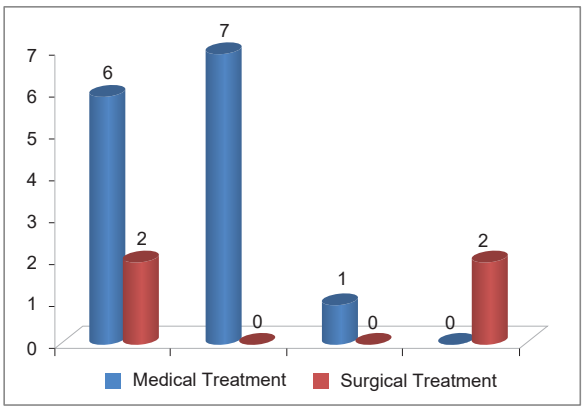

Figure-3: Various complications in medical and surgical treatments

Gestational sac diameter (GSD) was measurable in 38 patients as 10 patients were taken up for emergency laparotomy directly without USG. The mean GSD in patients was 8.2 ± 1.06 mm. Embryonic cardiac activity was seen in four cases. Mean myometrial thickness between the bladder and gestational sac was 2.2 ± 1.18 mm. Vascularity was mild in thirty and severe in eight cases. Serum b HCG <1000 was found in 15 patient, 1000-10000 in 20 and >10000 were found in 03 patients.

Treatment modalities used for forty- nine patients in this study varied from medical therapy with systemic methotrexate to emergency hysterectomy. The majority, i.e., thirty-five patients out of forty-nine patients were managed surgically, among them twenty-seven for a wedge excision of the scar and the trophoblastic tissue followed by uterine repair in two layers with Vicryl number 1 and eight for hysterectomy. Most of these patients presented after 8 weeks of gestation and had serum beta-HCG levels higher than 20,000 mu/ml. The most common operative finding in them was a bulge of trophoblastic tissue at the scar site varying in size, degree of vascularity, and the presence or absence of any myometrium/ serosa layer. The bladder was adherent to the scar covering a large hematoma (60x50mm) with trophoblastic tissue was seen involving scar and adjacent myometrium almost invading the uterine serosa. Even though bleeding was mild form this surface, a diagnosis of scar ectopic pregnancy rupture was made, and considering her hemodynamic status, continued vaginal bleeding and completed family, the decision for hysterectomy was taken after informed consent. Initial systemic methotrexate(50mg/m) was given to twenty-four patients after being counseled for prolong follow up and preparedness for necessary surgical intervention in case of hemorrhage or in appropriate response was there. Among those who received medical treatment 10 patients experienced successful outcome, while fourteen patients did not. For medical treatment among fourteen patients 6 patient experienced the persistent scar pregnancy, seven patients had vaginal bleeding, one patient had pain abdomen. In contrast for surgical treatment, only two patients experienced persistence of scar pregnancy, two for wound infection and no cases of vaginal bleeding or pain. Among the forty-nine patients twenty –one patients undergo emergency laparotomy for saving life ,due to torrential bleeding started during evacuation, among them.Eight patients need hysterectomy.

Discussion:

Scar pregnancy, is the most uncommon kind of ectopic pregnancy, with post-cesarean scars occurring more frequently.[7] It is regarded as a potentially fatal condition because placental attachment causes the scar to thin, and as gestational age increases, there is a chance of significant blood loss from uterine rupture and death.[8]

For the diagnosis to be confirmed, important previous medical history (such as a Caesarean section, D&C, or myomectomy), complaints, clinical examination, laboratory testing, and radiographic testing are necessary. Since a delayed or incorrect diagnosis could endanger the patient's life, prompt diagnosis and

appropriate treatment are crucial. The pathogenesis of uterine scar ectopic pregnancy can be explained by a variety of explanations. The fundamental pathophysiology appears to be the invasion of a blastocyst through a myometrial niche or a disturbed endometrium in a prior scar, which results in the development of an embryo encircled by the scar's fibrous tissue or myometrium.[9,10]

Trauma sustained during assisted reproductive technology (ART) in patients without a substantial medical history or prior surgery is another widely accepted idea that explains the origin of uterine scar ectopic pregnancy. The devastating behavior of ectopic pregnancy can be explained by the embryo's intramyometrial development.[11]

Aside from the lack of symptoms, the most typical initial sign is light, painless vaginal bleeding. Out of 49 individuals in this study, 20 complained of mild, painless vaginal bleeding, and 12 were asymptomatic.

Cervical pregnancy is a crucial differential diagnosis for scar ectopic pregnancy. Ultrasonography of the transvagina aids in distinguishing between the two situations. Because the gestational sac develops in the anterior part of the isthmus during cervical pregnancy, there is no myometrium between the sac and the bladder.[12]

The number of prior CS, time since the last CS, number of D&C, indication and timing of CS technique of uterine closure, history of curettage, or manual placenta removal are risk factors suggested for CSP. The mean age in this study was 32.68+3.78. This aligns with existing literature on the demographic characteristics of patients with cesarean scar pregnancy. Studies have consistently reported that women in their thirties are more commonly affected, reflecting the age group most likely to have undergone cesarean sections due to various obstetric reasons.[14] Studies such as those by Gul B et al. (2021), Verberkt C et al (2023) and Karahasanoglu A et al., (2018) have similarly reported mean ages in this range, reinforcing the demographic profile observed in this study.[15-17] For instance; Karahasanoglu A et al., (2018) reported that the mean maternal age was 32.5 years, range, 24-39 years, which is compatible with our study.[17] The distribution of previous lower segment cesarean sections (LSCS) among the study population indicated a notable history of multiple cesarean deliveries. Specifically, 40.0% of patients had undergone one prior LSCS, 48.9% had experienced two previous LSCS, and 11.1% had undergone three prior LSCS. This trend highlights a significant incidence of repeat cesarean deliveries among patients with cesarean scar pregnancies. Literature supports the association between multiple previous cesarean deliveries and an increased risk of cesarean scar pregnancies. Studies have shown that each additional cesarean delivery increases the likelihood of scar.

In this study one D&C was found in 24 patients and >1 D&C was found in 11 patients. Since the majority of research and the current study have demonstrated that CSP can develop even after a single CS, a clear relationship between the number of prior CS and risk of CSP has not been established. Twenty patients in this study had two CS, while twenty individuals had one CS.In the present study, the mean age of patients was 32.8(4.57) years, this aligns with existing literature on the demographic characteristics of patients with cesarean scar pregnancy. Studies have consistently reported that women in their thirties are more commonly affected, reflecting the age group most likely to have undergone cesarean sections due to various obstetric reasons. Studies such as those by Gul B et al. (2021), Verberkt C et al (2023) and Karahasanoglu A et al., (2018) have similarly reported mean ages in this range, reinforcing the demographic profile observed in this study.[15-17] For instance; Karahasanoglu A et al., (2018) reported that the mean maternal age was 32.5 years, range, 24-39 years, which is compatible with our study.[17]

This study represents that 48.9% of patients had undergone one prior LSCS, 40.5% had experienced two previous LSCS, and 10.4% had undergone three prior LSCS. Another study align the result of this study. There 40.0% of patients had undergone one prior LSCS, 48.9% had experienced two previous LSCS, and 11.1% had undergone three prior LSCS.[18] This trend highlights a significant incidence of repeat cesarean deliveries among patients with cesarean scar pregnancies.Literature supports the association between multiple previous cesarean deliveries and an increased risk of cesarean scar pregnancies. Studies have shown that each additional cesarean delivery increases

the likelihood of scar defects or abnormalities, which may contribute to the occurrence of cesarean scar pregnancies.[19-21]

Transvaginal ultrasonography is the common imaging technique. MRI can be utilized as a supplemental diagnostic modality when there is doubt. To increase the accuracy of transvaginal ultrasonography, color Doppler imaging a can be employed. Transvaginal ultrasonography confirmed the diagnosis of scar pregnancy in 16 patient in our cases.

Preserving the uterus for future reproductive and general health advantages and preventing severe bleeding are the main objectives of scar pregnancy management. But some of the cases present with failed attempt of MTP or D&C with on and off bleeding per vagina without doing any USG or wrong USG. Even a history of hemorrhagic shock also noted during D&E in the patients with undiagnosed scar pregnancy .In this study 10 patients came severe p/v bleeding with feature of shock and scar pregnancy was diagnosed peroperatively, among them hysterectomy was done for 8 patients to save the life. To avoid this complication, high suspicion and knowledge of the radiologist is necessary for early diagnosis of CSP. At the same time the obstetrician should be well experienced to diagnose a case of scar pregnancy depending on the clinical history and examination.

However, there is no inter nationally recognized diagnosis and treatment protocol for CSP. Among 49 cases of CSP systemic methotrexate was used in 24 cases, D&C in 04 cases, immediate laparotomy due to hemorrhagic shock of 10 cases, fist time laparotomy followed by scar excision of 11 patients.

Total 24 patients were treated with systemic MTX out of 49 cases. Among them 10 patients experience successful outcomes, while 6 patients experienced the persistent scar pregnancy, 07 patients had vaginal bleeding and one patient reported pain abdomen. Overall complication rate for surgical treatment was reported to 04 patients. The benefit of definitive care with a speedy recovery is that surgical scar excision and uterine repair by abdominal or laparoscopic technique avoid unexpected, delayed, or failed response as well as improper timing of complications associated with conservative methods. Additionally, it provides an improved method for myometrial defect repair and hemorrhage management.

Conclusion:

The incidence of CS is increasing day by day so keeping a high index of suspicion for the prompt and accurate diagnosis of CSP by both the gynecologist and ultrasonologist is the need of the hour. Delay in diagnosis or misdiagnosis of CSP leads to high morbidity and mortality of the patient. The necessity to report early in the following pregnancy is necessary because to the long-term problems of recurrence, morbid PAS condition, and ruptured uterus, which call for a multidisciplinary approach and significant competence for various customized therapies. For primary prevention the decision for CS without proper obstetrical indication should not be done.

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