



CHALLENGES IN MANAGEMENT OF CAESAREAN SCAR PREGNANCY

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(ABSTRACT)

Introduction: Caesarean scar pregnancy (CSP) is an infrequent yet potentially life-threatening occurrence. With the rising rates of caesarean sections (CS), the incidence of CSP is also increasing. Timely diagnosis and appropriate management of CSP are critical to prevent complications such as uterine rupture, severe haemorrhage, and maternal mortality. **Aims And Objectives:** **Material And Methods:** This retrospective cohort study was conducted among women who presented to the Department of Obstetrics and Gynaecology at MLN Medical College, Prayagraj, Uttar Pradesh, between march 2022 and February 2024, and were diagnosed with caesarean scar pregnancy. The study involved a thorough collection of clinical, laboratory, and radiological data from the medical records of 13 CSP cases. An analysis was performed on demographic and clinical features, as well as treatment modalities, which included variables such as age, gravidity, parity, number of previous caesarean sections, history of dilation and evacuation (D&E), history of abortifacient intake, presenting complaints, serum beta-hCG levels, sonographic features, and the need for blood transfusion. **Type Of Study:** retrospective cohort study. **Place Of Study:** MLN medical college Prayagraj Uttar Pradesh. **Duration Of Study:** March 2022 to February 2024. **Sample Size :** 13 **Results:** The average age of patients diagnosed with CSP was 29.6 ± 3.7 years. Nearly half of the patients (46%) had a history of D&E. Most cases (69.2%) had undergone one previous CS. A significant number of patients (38.46%) reported taking abortifacients during the current pregnancy. Vaginal bleeding was the primary presenting symptom, noted in 7 (53.85%) of the 13 cases, followed by pain, reported by 46.15% of patients. The average gestational sac diameter was 18.3 ± 4.15 mm. The mean serum beta-hCG level at presentation was 35480.27 ± 45214 mIU/ml. Out of 13 patients, seven patients underwent surgical management, with laparotomy involving wedge excision of the scar and trophoblastic tissue and two patients required emergency hysterectomy while the rest were managed medically. **Conclusion:** Prompt and accurate diagnosis of CSP is crucial due to increasing caesarean rates. Maintaining a high index of suspicion is essential to prevent severe complications.

KEYWORDS : caesarean scar pregnancy, myometrial thickness, ectopic, beta-hCG

INTRODUCTION

Ectopic pregnancy is characterized by the implantation of a fertilized ovum outside the endometrial cavity.¹ Specifically, Caesarean scar pregnancy is a form of ectopic pregnancy situated in the myometrium at the site of a prior Caesarean scar.² The combination of serum beta HCG and ultrasound imaging has significantly improved the early and precise diagnosis of Caesarean scar pregnancy (CSP). This advancement plays a key role in successfully preserving the uterus while minimizing maternal complications.³

Caesarean scar pregnancy (CSP) is associated with critical complications like scar rupture, haemorrhage, and disseminated intravascular coagulation (DIC), often necessitating a life-saving hysterectomy.⁴ Various conservative treatments, including dilatation and curettage, excision of trophoblastic tissue, and local or systemic administration of methotrexate, have been used to manage the condition and preserve the uterus.⁵



Image: Intraoperative caesarean scan pregnancy

MATERIAL AND METHODS

This was a retrospective observational study conducted in women presenting to the department of obstetrics and gynaecology MLN Medical College, Prayagraj between January 2021 to March 2023. A total of 10272 deliveries were conducted at our institute out of which 13 were diagnosed as caesarean scar pregnancies.

Out of the 13 patients identified, 7 had undergone various treatments outside our hospital, including MTP pill or surgical MTP, and presented with significant vaginal bleeding. All these cases had been either misdiagnosed or undiagnosed prior to their arrival. Among these, 5 patients had taken MTP pill, with 3 of them subsequently undergoing Dilatation and evacuation. Additionally, 2 out of the 7 patients had undergone Dilatation and evacuation procedures before seeking care at our institute.

Ultrasound diagnostic criteria included an empty uterine cavity and cervical canal with a gestational sac with or without cardiac activity embedded in anterior myometrium or fibrous tissue of the scar at the level of isthmus and separate from endometrial cavity. Myometrial thickness between bladder and gestational sac was also noted.⁶

Clinical laboratory and radiological data from the medical records of 13 Caesarean Scar Pregnancy (CSP) cases were comprehensively collected. An analysis of clinical and demographic features, along with treatment modalities, was conducted.

RESULTS**Baseline Characteristics (Table 1)**

The mean age of patients diagnosed with caesarean scar pregnancy was 29.6 ± 3.7 years. The mean gravida and parity were 2.5 ± 0.498 and 1.38 ± 0.48 . 46% of patients had a previous history of dilation and evacuation. Majority of cases 69.2% had undergone 1 previous caesarean section (LSCS). The median duration between the last

caesarean section and the diagnosis was 2.5±1.04 years. A significant proportion (38.46%) of patients had a history of abortifacient intake during the present pregnancy. The mean period of gestation at presentation was 8.15±0.948 weeks.

Table1 Clinical Profile Of Patients

CASE	AGE	G R A P I D A T Y	A P A R T Y	h / o D & E	No. of L S C S	I N T E R P R E G N A N C Y I N T E R V A L	h / o M T P P i l l	P O G
1	36	3	2	Y	2	2yr	Y	8
2	29	3	2	Y	2	1yr	Y	9
3	25	2	1	Y	1	2yr	Y	8
4	24	2	1	N	1	3yr	Y	6
5	27	3	1	N	1	2yrs	Y	7
6	36	3	2	Y	1	4yr	N	9
7	33	3	2	Y	2	3yr	N	9
8	30	2	1	N	1	2yr	N	9
9	31	3	1	N	1	5yr	N	7
10	28	2	1	N	1	2yr	N	8
11	25	2	1	N	1	2yr	N	9
12	30	2	1	N	1	3yr	N	8
13	31	3	2	Y	2	18months	N	9

Clinical Characteristics (Table 2)

Among the patients, the predominant presenting symptom was vaginal bleeding, noted in 7(53.85%) of cases out of 13, followed by pain, which was reported by 46.15% of patients. Table 2 summarizes the presenting symptoms in women, the majority of whom presented with vaginal bleeding. Initial ultrasound examinations confirmed a correct diagnosis of CSP in 5 cases (38.46%), while in the remaining 8 patients (61.54%), the initial diagnosis did not indicate CSP. Among the 8 women with initial ultrasound failures to diagnose CSP, adverse outcomes were associated with two cases.

Table 2 Clinical Presentation

CAS E	ABDOMI NAL PAIN	BLEED I N G P V	INITIAL DIAGNOSIS	DELAY I N DIAGNOSIS
1	Yes	Yes	Incomplete abortion	Yes
2	Yes	Yes	Intrauterine pregnancy	Yes
3	No	Yes	Incomplete abortion	Yes
4	No	No	Intrauterine pregnancy	Yes
5	Yes	Yes	Intrauterine pregnancy	Yes
6	No	No	Incomplete abortion	Yes
7	Yes	Yes	Incomplete abortion	Yes
8	No	Yes	Caesarean scar pregnancy	No
9	No	No	Caesarean scar pregnancy	No
10	Yes	No	Caesarean scar pregnancy	No
11	Yes	No	Caesarean scar pregnancy	No
12	No	No	Caesarean scar pregnancy	No
13	no	Yes	Incomplete abortion	Yes

Diagnosis And Management Characteristics (Table 3 And 4)

Gestational sac diameter (GSD) measurements were feasible in ten patients and 3 presented with hematoma formation around the implantation site, making it challenging to measure the sac diameter independently. Among those where measurement was possible, the mean GSD was 18.3±4.15 mm. Embryonic cardiac activity was observed in 6 cases. The mean thickness of the myometrium between the bladder and gestational sac was 3.18 1.17mm. The average serum beta-hCG level upon presentation was 35480.27±45214 mIU/ml.

Treatment strategies for the 13 patients included in this study were diverse, ranging from medical intervention with systemic methotrexate to emergency hysterectomy. Among them, the majority, comprising 9 out of 13 patients, underwent surgical management via laparotomy. This involved wedge excision of the scar and trophoblastic tissue, followed by uterine repair using Vicryl number 1 in two layers. A common operative observation was the presence of trophoblastic tissue bulging at the scar site, varying in size, vascularity, and the involvement of myometrial/serosal layers. In two cases, adhesion of the bladder to the scar tissue covering the ectopic gestation was observed; nevertheless, there was no evidence of intraluminal invasion in any of these cases. Following surgery, all patients had an uneventful postoperative recovery.

In Case 2, surgical termination of pregnancy was performed due to a misdiagnosis of intrauterine pregnancy during bedside ultrasound. Subsequently, significant blood loss ensued, leading to the transfer of the patient to MLN where the diagnosis of CSP was confirmed. In Case 13, initial ultrasound diagnosis indicated a miscarriage, prompting treatment with misoprostol. This intervention was followed by substantial blood loss(>2000 mL), necessitating suction curettage. Upon diagnosis of scar ectopic pregnancy rupture, and considering her hemodynamic instability, persistent vaginal bleeding, and completed family, the decision for hysterectomy was made after obtaining informed consent.

Four patients received medical management after thorough counseling regarding prolonged follow-up and readiness for potential surgical intervention if haemorrhage or inadequate response occurred. Initially admitted for 24–48 hours, they shifted to outpatient care for continued follow-up.

In case 4, a 24-year-old female with a history of previous medical termination of pregnancy (MTP) pill intake due to an intrauterine pregnancy on her prior scan presented at 6 weeks of gestation. Considering her stable hemodynamic status and willingness to comply with follow-up, she received medical management with methotrexate (MTX) administered on days 1, 3, 5, and 7. Subsequently, she underwent monitoring of beta-hCG levels on days 4 and 7, followed by weekly assessments until levels dropped below 1. Additionally, ultrasonography was conducted weekly for four weeks and then monthly for three months to monitor progress. Case 12 was also managed medically with multiple dose methotrexate and was subsequently monitored for beta hcg levels weekly took almost 7weeks time to resolve completely.

In case 9, a 31yr old woman who conceived through intrauterine insemination (IUI) after 5 years since her last caesarean section was diagnosed as caesarean scar pregnancy on ultrasound at 7 weeks of gestation After assessment, she was prescribed systemic methotrexate along with orally administered mifepristone (200 mg), followed by a two doses of vaginal misoprostol (400 µg) after 48 hours. Fortunately, she expelled the products of conception within 12 hours.

Case 5 was also managed medically with systemic methotrexate, mifepristone and vaginal misoprostol but became noncompliant and did not consent to any further intervention. Subsequently, she was lost to follow-up.

Diagnosis And Management Characteristics (Table 3 And 4)

case s	Mean sac diameter/ haematoma	Cardiac activity	Myometrial thickness between bladder and gestational sac	hae m oglobi n
1	G sac 20mm	Present	2mm	8.5
2	G sac 22mm	Absent	N o r e s i d u a l m y o m e t r i u m	16
3	G sac 26mm	Present	3mm	8
4	G sac 12mm	Absent	5mm	10.5
5	G sac 18mm	Present	4mm	11
6	G sac 20mm	Present	2mm	8
7	G sac 15mm	Present	2mm	10
8	G sac 12mm	Absent	3mm	11
9	H a e m a t o m a 35*30mm	Present	5mm	12
10	G sac 18mm	Absent	3mm	7.5
11	H a e m a t o m a 52*48*32mm	Absent	2mm	9
12	G sac 20mm	Absent	4mm	9
13	H a e m a t o m a 58*50*38mm	Absent	N o r e s i d u a l m y o m e t r i u m	16

CAS ES	MEDICAL MANAGEM ENT	SURGICAL MANAGE MENT	B E T A H C G O N A D M I S S I O N	T I M E T A K E N T O A C H I E V E H C G < 1	B L O O D T R A N S F U S I O N S
1		Excision of scar with uterine repair	44,176	8wk	1
2		Hysterectomy	N o r e c o r d s		4

3		Excision of scar with uterine repair	32,424	8wk	1
4	Multiple MTX doses		11,236	7wk	0
5	Mifepristone(oral) + Misoprostol(vaginal) + MTX(im)		9,822	Loss to follow up	0
6		Excision of scar with uterine repair	30,411	7wk	1
7		Excision of scar with uterine repair	27,204	7wk	0
8		Excision of scar with uterine repair	21,724	7wk	0
9	Mifepristone(oral) + Misoprostol(vaginal) + MTX(im)		8,444	6wk	0
10		Excision of scar with uterine repair	1,74,414	8wk	2
11		Excision of scar with uterine repair	18,204	7wk	0
12	Multiple MTX doses		12,224	7wk	0
13		hysterectomy	No records		3

DISCUSSION

The earliest documented case of Caesarean scar pregnancy (CSP) dates back to 1978, where a misdiagnosis of incomplete abortion resulted in severe haemorrhage.⁷ More recently, CSPs have been categorized into two types: the first type involves inward growth, potentially leading to a viable fetus but carrying a high risk of abnormally invasive placenta and severe bleeding. The second type, as observed in our case, entails growth towards the serosal uterine surface, posing a significant risk of early pregnancy rupture.⁸

The increasing utilization of early gestational ultrasound and the rising prevalence of caesarean section deliveries have contributed to a notable escalation in the incidence of Caesarean scar pregnancy (CSP).⁷ In our study, we found the incidence to be 1 in 790 ectopic pregnancies, which is considerably higher compared to other research findings, where it ranges from 1 in 2226 to 1 in 1800 pregnancies.^{9,10} This heightened incidence can be attributed to the fact that our hospital serves as a tertiary care and referral center, receiving referrals for complicated cases from nearby cities.

Caesarean scar pregnancy (CSP) is a rare and challenging condition that requires prompt diagnosis and appropriate management to prevent serious complications. Our study aimed to characterize the clinical features, management strategies, and outcomes of patients diagnosed with CSP, and to compare them with existing literature to provide a comprehensive understanding of this condition.

The mean age of patients diagnosed with CSP in our study was 29.6 ± 3.7 years, which is consistent with previous studies indicating that CSP most commonly affects women in their late 20s to early 30s⁽¹¹⁾. This age group is often at higher risk due to the increased rate of caesarean sections in recent years.

A significant proportion (46%) of our patients had a previous history of dilation and evacuation, which could be a potential risk factor for CSP⁽¹²⁾. The majority of patients (69.2%) had undergone one previous caesarean section (LSCS), highlighting the association between previous caesarean delivery and the development of CSP⁽¹³⁾. This finding is consistent with previous studies showing that the risk of CSP is higher in women with a history of caesarean section.

The median duration between the last caesarean section and the diagnosis of CSP was 2.5 ± 1.04 years. This interval is important as it

reflects the time it takes for CSP to develop after a caesarean section⁽¹⁴⁾. A shorter interval may indicate an increased risk of CSP, although further research is needed to establish a definitive association. A significant proportion (38.46%) of our patients had a history of abortifacient intake during the present pregnancy, which could be a potential risk factor for CSP⁽¹⁵⁾. This finding is consistent with previous studies showing that the use of abortifacients is associated with an increased risk of CSP.

The mean period of gestation at presentation was 8.15 ± 0.948 weeks, which is consistent with previous studies indicating that CSP is often diagnosed in the first trimester of pregnancy. Vaginal bleeding was the predominant presenting symptom, noted in 53.85% of cases, followed by pain, reported by 46.15% of patients. These findings are consistent with previous studies showing that vaginal bleeding and pain are common symptoms of CSP.

Initial ultrasound examinations confirmed a correct diagnosis of CSP in 38.46% of cases, while in the remaining 61.54%, the initial diagnosis did not indicate CSP. This highlights the importance of using specific ultrasound criteria for the diagnosis of CSP, such as the presence of a gestational sac embedded in the caesarean scar with a thin or absent myometrial layer between the bladder and the sac⁽⁹⁾.

Gestational sac diameter (GSD) measurements were feasible in ten patients, with a mean GSD of 18.3 ± 4.15 mm. Embryonic cardiac activity was observed in 6 cases. These findings are consistent with previous studies indicating that CSP is often associated with a small gestational sac and embryonic cardiac activity⁽¹⁶⁾.

Treatment strategies for the 13 patients included in our study were diverse, ranging from medical intervention with systemic methotrexate to emergency hysterectomy. The majority of patients (9 out of 13) underwent surgical management via laparotomy, involving wedge excision of the scar and trophoblastic tissue, followed by uterine repair using Vicryl number 1 in two layers⁽¹⁷⁾. This is consistent with current guidelines recommending surgical management as the primary treatment for CSP, especially in cases where medical management is contraindicated or unsuccessful.

Four patients in our study received medical management with methotrexate, mifepristone, and misoprostol, after thorough counseling regarding prolonged follow-up and readiness for potential surgical intervention if hemorrhage or inadequate response occurred.⁽¹⁸⁾ Followed a multi dose regimen consisting of 1mg/kg of methotrexate on day 1,3,5 and 7 alternating with 0.1mg/kg of Leucovorin on day 2,4,6 and 8. This approach is consistent with current guidelines recommending medical management as a first-line treatment option for selected patients with CSP, especially those who are hemodynamically stable and willing to comply with follow-up.

CONCLUSION

Caesarean scar pregnancy (CSP) presents a unique and challenging aspect of ectopic pregnancy, demanding a keen clinical suspicion for timely diagnosis and management. Characterized by the implantation of the embryo near a previous caesarean scar, CSP necessitates a multidisciplinary approach involving skilled sonographers, minimal invasive surgeons, and interventional radiologists.

Early detection is paramount to avoid catastrophic complications such as scar rupture. While termination of pregnancy is often recommended due to potential risks, individualized care is essential, particularly for patients with fertility aspirations. The escalating incidence of CSP underscores the critical need for judicious evaluation of caesarean section indications to mitigate future occurrences.

Future advancements hinge on comprehensive research, including well-designed trials, to establish consensus on optimal management. This is vital not only to enhance fertility preservation options but also to improve overall outcomes and quality of care for women affected by CSP.

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