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# Caesarean Scar Ectopic Pregnancies: A Novel Medical Management Approach in Bangladesh

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**Abstract** **Original Research Article**

***Background:*** Caesarean scar ectopic pregnancy (CSEP) is a rare but potentially life-threatening condition where implantation occurs within the scar tissue of a previous caesarean section. With the increasing rates of caesarean deliveries, the incidence of CSEP is expected to rise, posing significant risks such as uterine rupture, severe hemorrhage, and infertility. Early diagnosis and effective management are critical to preventing severe maternal morbidity. In Bangladesh, where access to specialized surgical interventions is limited, non-invasive treatment approaches such as methotrexate offer a promising alternative. ***Objective:*** This study aims to evaluate the effectiveness and feasibility of methotrexate as a primary medical management strategy for CSEP in Bangladesh, assessing treatment outcomes and comparing findings with existing literature. ***Methods:*** This prospective case study was conducted from July 1, 2022, to December 31, 2024 at Gazi Medical College Hospital and Khalishpur Clinic in Bangladesh. Eleven women diagnosed with CSEP between the ages of 25 to 35 years and at a gestational age of 5 to 7 weeks were included. Diagnosis was confirmed using transvaginal ultrasonography (TVS) and serum beta-human chorionic gonadotropin (BHCG) levels. Patients were treated with a single 50 mg dose of methotrexate, with serial BHCG monitoring on 0, 3, 7, 14 and 30 days post-treatment. Additional methotrexate doses, and/or laparotomy were administered if required. TVS was performed at 7 and 30 days to confirm the resolution of the gestational sac. ***Results:*** In our study, out of 11 cases, 8 required a single dose of methotrexate, while 2 case needed two doses, and one case needed Laparotomy as the gestational sac did not resolve after 2 doses of Methotrexate. Among the eleven cases, eight (72.7%) responded successfully to a single dose of methotrexate, demonstrating a significant reduction in serum BHCG levels and complete resolution of the gestational sac within 7 days. Two patients (18%) needed an additional methotrexate dose because of inadequate BHCG reduction following the initial treatment. One patient needed Laparotomy after the 2nd dose of Methotrexate. By day 30, 10 cases showed complete resolution on TVS, with no residual abnormalities or complications. Only one patient needed Laparotomy after the 2nd dose of Methotrexate. The overall success rate of methotrexate treatment in this study was 90%, among those single doses needed 73% of patients. ***Conclusion:*** Methotrexate demonstrated a high success rate as a non-invasive medical management option for CSEP, highlighting its potential for resource-limited settings such as Bangladesh. The findings align with previous studies, emphasizing the importance of early detection, timely intervention, and patient selection to optimize outcomes. This study supports the integration of methotrexate-based protocols into clinical practice to reduce the need for surgical interventions and improve maternal healthcare.

**Keywords:** Caesarean scar ectopic pregnancy, methotrexate, medical management, transvaginal ultrasonography, BHCG monitoring, Bangladesh, early diagnosis, non-surgical treatment.



## INTRODUCTION

Caesarean scar ectopic pregnancy (CSEP) is a rare but life-threatening form of ectopic pregnancy where the fertilized egg implants within the scar tissue of a previous caesarean section. This condition poses significant risks, including uterine rupture, severe hemorrhage, and infertility if not diagnosed and managed promptly. With the rising number of C-sections worldwide, particularly in Bangladesh, the incidence of

CSEP is expected to increase, necessitating improved awareness, early diagnosis, and effective treatment strategies. Despite its rarity, the condition is gaining attention in medical communities due to advancements in diagnostic techniques and treatment options [1-3].

In Bangladesh, where maternal health services are still developing, managing CSEP presents unique challenges. Limited access to early pregnancy ultrasound, lack of awareness among healthcare professionals, and delayed referrals often lead to late-stage diagnosis, increasing the risk of complications. Traditionally, CSEP was managed through surgical interventions, including hysterectomy in severe cases [4-5]. However, surgical approaches carry higher risks, including loss of fertility, increased morbidity, and longer recovery periods. As a result, there is an urgent need for alternative, less invasive management strategies that can effectively treat CSEP while preserving the uterus and future reproductive potential [6-7].

Recent advances in medical management have introduced novel approaches for treating CSEP without resorting to major surgery. The use of systemic and local methotrexate, uterine artery embolization, and minimally invasive procedures such as hysteroscopic or laparoscopic interventions have shown promising results in managing CSEP cases effectively [8-10]. These methods are particularly beneficial in resource-limited settings like Bangladesh, where access to highly specialized surgical care may not always be available. Implementing these novel techniques can significantly improve patient outcomes, reduce the burden on healthcare facilities, and lower the risks associated with traditional surgical management.

The introduction of medical management for CSEP in Bangladesh represents a significant step forward in maternal healthcare. By integrating advanced diagnostic tools such as transvaginal ultrasonography and Doppler imaging with conservative treatment approaches, healthcare providers can detect and manage CSEP in its early stages, preventing life-threatening complications. Moreover, increasing awareness among obstetricians, gynecologists, and primary care providers about the risks and symptoms of CSEP can facilitate earlier diagnosis and timely intervention, ultimately improving maternal health outcomes.

### Objective

This study aims to explore the novel medical management strategies for CSEP in Bangladesh, highlighting their effectiveness, safety, and feasibility in the country's healthcare system.

## METHODOLOGY

### Study Type and Duration

This study was designed as a small randomized prospective case study to analyze the medical management of caesarean scar ectopic pregnancy (CSEP). The study was conducted from July 1, 2022, to December 31, 2024, at Gazi Medical College Hospital and Khalishpur Clinic in Bangladesh.

### Study Population

The study included eleven women diagnosed with CSEP. These women were between the ages of 25 to 35 years and presented at 5 to 7 weeks of gestation. The diagnosis was confirmed through transvaginal ultrasonography (TVS) and serum beta-human chorionic gonadotropin (β-hCG) levels.

### Data Collection

Data were collected from patient medical records, including demographic details, previous obstetric history, gestational age at presentation, clinical symptoms, and ultrasound findings. The primary treatment involved administering a single dose or two doses of methotrexate (50 mg) for medical management. Follow-up monitoring was conducted with serial serum β-hCG levels on days 0, 3, 7, 14, and 30 days post-treatment. Additionally, TVS was performed on days 7 and 30 to assess the resolution of the ectopic pregnancy.

### Data Analysis

Descriptive statistical methods were used to analyze the effectiveness of methotrexate treatment. The decline in serum β-hCG levels and ultrasound findings were assessed to determine treatment success. The resolution of ectopic pregnancy without surgical intervention was considered a positive outcome. The findings were compared to existing literature on CSEP management to evaluate the feasibility and success of medical management in the local healthcare setting.

## RESULTS

In our study, out of 11 cases, 8 required a single dose of methotrexate, while 2 cases needed two doses. One patient needed Laparotomy after the 2nd dose of Methotrexate. Table 1 outlines the demographic and clinical characteristics of 11 patients with a history of cesarean sections (C/S) who were treated with Methotrexate for ectopic pregnancies. Key parameters such as age, GTPAL (Gravida, Term births, Preterm births, Abortions, Living children), number of previous C/S, type of C/S scar, gestational age (GA) at diagnosis, and management are presented.

**Table 1: Methotrexate Treatment for Ectopic Pregnancy with Previous Cesarean Sections**

| No of Patient | Age | GTPAL | Number of Previous C/S | C/S scar | GA | Management |
|---|---|---|---|---|---|---|
| 1 | 27 | 2/1/0/0/1 | 1 | LUCS | 7+2 | Methotrexate 50 mg IV once |
| 2 | 25 | 3/1/0/1/1 | 1 | LUCS | 6+3 | Methotrexate 50 mg IV once |
| 3 | 28 | 3/1/0/1/1 | 1 | LUCS | 7+1 | Methotrexate 50 mg IV q1week twice |
| 4 | 30 | 4/2/0/2/2 | 2 | LUCS | 5+4 | Methotrexate 50 mg IV once |
| 5 | 25 | 2/1/0/0/1 | 1 | LUCS | 6+2 | Methotrexate 50 mg IV once |
| 6 | 31 | 3/1/0/1/1 | 1 | LUCS | 7+2 | Methotrexate 50 mg IV q1wk twice, Failed, Laparotomy needed |
| 7 | 8 | 2/1/0/0/1 | 1 | LUCS | 6+2 | Methotrexate 50 mg IV once |
| 8 | 31 | 3/1/0/1/1 | 1 | LUCS | 7+5 | Methotrexate 50 mg IV q1wk twice |
| 9 | 35 | 3/2/0/1/2 | 2 | LUCS | 7+0 | Methotrexate 50 mg IV once |
| 10 | 31 | 3/1/1/0/1 | 1 | LUCS | 5+4 | Methotrexate 50 mg IV once |
| 11 | 28 | 3/1/0/1/1 | 1 | LUCS | 6+2 | Methotrexate 50 mg IV once |

**LUCS-Lower uterine Caesarean Section**

The study included eleven cases of Caesarean scar ectopic pregnancies, with the distribution of the two age groups: 25–30 years (64%), and 31–35 years (36%). Regarding gestational age, the majority of cases (55%) were diagnosed between 5 to 6 weeks of pregnancy, while the remaining 45% were detected at 7 weeks. These are shown in Table 2.

**Table-2: Demographic Characteristics of Patients**

| Parameter | Number of Cases (n=11) | Percentage (%) |
|---|---|---|
| **Age Group (Years)** | | |
| 25 - 30 | 7 | 64% |
| 31 - 35 | 6 | 36% |
| **Gestational Age (Weeks)** | | |
| 5 - 6 | 6 | 55% |
| 7 | 5 | 45% |
| **Dose of methotrexate** | | |
| Single dose of methotrexate | 8 | 72% |
| Two dose of methotrexate | 3 | 27% |

The results of methotrexate treatment for Caesarean scar ectopic pregnancy demonstrated a high success rate with medical management. Among the eleven cases, eight (72.7%) responded effectively to a single 50 mg dose of methotrexate, showing a reduction in serum BHCG levels and complete resolution of the gestational sac within 7 days. Only three cases (27%) required a second dose, as the initial treatment did not lead to a sufficient decline in BHCG levels. However, after the second dose, BHCG levels decreased, and the ectopic pregnancy was resolved in two cases. Follow-up transvaginal scans (TVS) at 7 and 30 days confirmed the complete resolution of the gestational sac in all cases, with no residual abnormalities. Only one patient (9%) needed Laparotomy after the 2nd dose of Methotrexate. These are shown in Table 3.

**Table 3: Methotrexate Treatment and Follow-up Results**

| Case No. | Methotrexate Dose | BHCG Reduction at 7 Days | TVS Findings at 7 Days | BHCG at 30 Days | TVS Findings at 30 Days | Addition al Dose Needed |
|---|---|---|---|---|---|---|
| 1 | 50 mg (Single) | Yes | Resolved | Normal | No Gestational Sac | No |
| 2 | 50 mg (Single) | Yes | Resolved | Normal | No Gestational sac | No |
| 3 | 50 mg (Two Doses) | No (1st Dose) → Yes (2nd Dose) | Resolved after 2nd dose | Normal | No Gestational Sac | Yes |
| 4 | 50 mg (Single) | Yes | Resolved | Normal | No Gestational Sac | No |
| 5 | 50 mg (Single) | Yes | Resolved | Normal | No Gestational Sac | No |
| 6 | 50 mg (Two Doses) | No (1st Dose) → Yes (2nd Dose) | Not resolved after 2nd dose | Normal | Laparotomy done | Yes and laparotomy needed |
| 7 | 50 mg (Single) | Yes | Resolved | Normal | No Gestational Sac | No |
| 8 | 50 mg (Two Doses) | No (1st Dose) → Yes (2nd Dose) | Resolved after 2nd dose | Normal | No Gestational Sac | Yes |
| 9 | 50 mg (Single) | Yes | Resolved | Normal | No Gestational Sac | No |
| 10 | 50 mg (Single) | Yes | Resolved | Normal | No Gestational Sac | No |
| 11 | 50 mg (Single) | Yes | Resolved | Normal | No Gestational Sac | No |

## DISCUSSION

The findings of our study highlight the effectiveness of methotrexate in the medical management of Caesarean scar ectopic pregnancy, with 80% of cases responding successfully to a single dose. These results are comparable to previous studies that have examined the use of methotrexate for similar cases [11]. For instance, studies reported success rates between 70% and 90% with single-dose methotrexate therapy, aligning closely with our findings. This suggests that methotrexate remains a reliable and non-invasive option for managing Caesarean scar ectopic pregnancies in selected cases, avoiding the need for surgical intervention.

One similarity between our study and previous research is the gestational age at diagnosis. Studies have noted that early detection (5–7 weeks of gestation) significantly improves treatment outcomes, as was the case in our study [13]. Our study also emphasizes that early diagnosis allows for more effective methotrexate treatment before significant vascularization occurs, reducing the risk of complications [12]. The fact that most of our cases were diagnosed between 5 and 7 weeks reinforces the importance of early transvaginal ultrasonography in identifying and managing scar ectopic pregnancies.

However, a key difference between our study and other reports is the low rate of requiring a second dose of methotrexate. While our study observed only three cases (27%) needed an additional dose, and among those three cases, in two cases gestational sac resolved, and serum BHCG went down to normal at 30 days, and one case (9%) needed laparotomy after the 2nd dose as gestational sac remained in situ and there was profuse bleeding. Previous studies have reported rates as high as 30–40% for multiple-dose regimens [10]. This variation may be due to differences in patient selection, initial BHCG levels, or the timing of intervention. In our study, early detection and prompt administration of methotrexate likely contributed to a lower need for additional doses. However, further research with a larger sample size is needed to confirm whether our findings reflect a broader trend.

Another notable difference lies in the reported success rates of medical versus surgical management. Studies have indicated that while methotrexate is highly effective in many cases, surgical intervention is often required in cases with high BHCG levels or persistent gestational sacs [9, 7]. Our study showed complete resolution of all cases with methotrexate alone, suggesting that careful patient selection plays a crucial role in determining treatment success. In contrast, some studies have recommended surgical approaches, such as suction curettage or laparoscopic resection, for cases with larger gestational sacs or failed medical treatment.

Finally, our study contributes valuable insights into the feasibility of methotrexate management in resource-limited settings such as Bangladesh. Compared to studies conducted in high-income countries, where advanced imaging and surgical techniques are more accessible, our study demonstrates that methotrexate can be a cost-effective and accessible alternative in developing countries. The ability to manage Caesarean scar ectopic pregnancies medically, without the need for expensive and invasive procedures, is particularly relevant for healthcare systems with limited resources.

## CONCLUSION

In conclusion, our findings align with existing literature supporting the use of methotrexate for Caesarean scar ectopic pregnancies while highlighting some unique differences, such as a lower rate of additional dose requirements and complete resolution in all cases. The success of methotrexate treatment in our study underscores the importance of early detection, appropriate patient selection, and close monitoring to achieve optimal outcomes. Future research with larger cohorts and long-term follow-up will be essential to further validate these findings and refine treatment protocols for Caesarean scar ectopic pregnancies.

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