Evaluation of Different Modalities in The Management of Cesarean Scar Ectopic Pregnancy A.M. Nofal, D. I. Morsi

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ABSTRACT

Background: Cesarean Scar Ectopic Pregnancy (CSEP) refers to a condition when an early fertilized ovum implants inside the area of a Cesarean scar.

Objective: This study aimed to evaluate different modalities in management of first trimester CSEP.

Patients and methods: This prospective cohort study included 27 patients with Cesarean scar ectopic in the first trimester of pregnancy. This study was done at Menoufia University Hospital after approval of the Committee of Medical Ethics. Thorough history taken and cases were managed based on the hemodynamic status of the patient, gestational age, patient preference and desire for future fertility. The various treatments that were used are expectant, medical methotrexate either via systemic or local intragestational injection, ultrasound guided dilatation and curettage, suction and evacuation or surgical excision (hysterotomy).

Results: Expectant management had a failure and complication percentage of 100%, systemic methotrexate success percentage was 33.3%, complication percentage was 16.7% and local intragestational methotrexate had success percentage75%. Suction evacuation had success percentage of 80%, complication percentage was 20%, while US-guided D & C had success percentage of 75% and complication percentage of 50%. Surgical excision (hysterotomy) had success percentage of 100% and complication percentage of 20%.

Conclusion: It could be concluded that active management of Cesarean scar ectopic surgically or through local methotrexate injection had a better success rate than systemic methotrexate and expectant management. **Keywords:** CSEP, Surgical excision, Methotrexate, Suction evacuation.

INTRODUCTION

Cesarean scar pregnancy (CSP) refers to the implantation of a fertilized ovum within a prior CS scar ⁽¹⁾. It was classified into two types: Endogenous, which can grow into the uterine cavity but has a danger of developing a placenta accreta. The second kind is exogenous, which can develop outward and increase the risk of uterine scar rupture ⁽²⁾. Although, the incidence of CSP is modest, it has grown due to an increase in the number of Cesarean births ⁽³⁾.

In CSP, the fertilized ovum implants in the myometrium and fibrous scar tissue by penetrating the myometrium via a tiny channel between the CS scar and the endometrial cavity $^{(4, 5)}$.

In the second or third trimester, the CSP may manifest as a spontaneous abortion in the first trimester or with complications such as uterine rupture or a morbidly attached placenta⁽⁶⁾. A variety of techniques have been described for the management of CSEP, such medical or surgical methods of expectant as management or pregnancy termination through hysteroscopy, laparoscopy, open surgery, sharp suction evacuation, curettage, uterine artery embolization (UAE), methotrexate administration both locally and systemically, direct injection of potassium chloride (KCl), high-intensity focused ultrasound imaging, balloon catheters, and combinations of these techniques. Depending on clinical competence and facility characteristics, preferred management may vary throughout institutions ⁽⁷⁾.

Therefore, the aim of this study was to evaluate different modalities in management of first trimester CSEP.

PATIENTS AND METHODS

This prospective observational cohort study was done in Obstetrics and Gynecology Department in Menoufia University Hospitals through the period from February 2023 to October 2024.

The following data were recorded:

Maternal age (Years), Parity, Gestational age (weeks), Number of previous Cesarean deliveries, Presence of fetal cardiac activity in an ultrasound scan, History of medical disorders or previous surgeries. Then the thorough examination was done with assessment of BMI.

CSEP was diagnosed based on a clinical history, pelvic examination, serum b-hCG level, and transvaginal ultrasound scan. The following criteria were satisfied to make a transvaginal ultrasound diagnosis of CSEP: (1) An empty uterine cavity. (2) An empty cervical canal. (3) The presence of a gestational sac, with or without fetal cardiac activity, in the anterior part of the uterine isthmus. (4) The absence or thinning myometrium bladder of at the level. (5)Peritrophoblastic or periplacental flow surrounding the CSEP as seen on a Doppler flow ultrasonogram⁽⁸⁾.

The patient's hemodynamic condition, gestational age, preferences, and desire for future fertility were taken into consideration while making management decisions. Methotrexate doses of 1 mg/kg of maternal weight were among the many treatment paradigms that were employed ⁽⁹⁾. Either by surgical hysterotomy, ultrasound-guided dilatation and curettage, suction and evacuation, or systemic or local intragestational injection (done with a 20-gauge needle under ultrasound guidance utilizing a transvaginal approach).

The three criteria for a successful CSEP therapy were: (1) Total elimination of the products of conception, (2) no requirement for a second line of treatment, and (3) normalization of blood b-hCG levels within four weeks.

The B-hCG levels in the patients' blood were to be checked once a week until they stabilized. Two weeks following therapy, an ultrasound check was also performed to ensure that all products of conception had been eliminated and to track the condition until it had fully resolved.

Inclusion criteria: Patients who had an CSEP during the first trimester of pregnancy.

Exclusion criteria: Concomitant medical disorders such as DM, HTN, Renal failure etc., - Hypersensitivity to methotrexate. - Patients with CS ectopic beyond first trimester.

Ethical approval: Approval of The Ethical Committee of Menoufia University was taken under number 2/2023OBSG20-2. Informed consent was taken from each patient. Personal privacy and confidentiality were upheld during the study duration. The Helsinki Declaration was followed throughout the course of the study.

Statistical analysis

The following statistics were used once the data were gathered and collated and statistically analyzed using an IBM personal computer running SPSS version 20. Quantitative data were displayed as mean \pm SD, range, median, and interquartile range, whereas qualitative data were displayed as percentages and numbers. Statistical significance was defined as a P value ≤ 0.05 .

RESULTS

Mean maternal age was 29.7 years, mean body mass index (BMI) was 26.5(Kg/m²), mean parity was 2.8, fetal **cardiac pulsation was detected in** 63% of cases, mean **number of previous CS** was 2.3, mean **Basal B** hCG was 13000 m IU/ml, mean hospital stays (days) was 3.8, and mean Gestational age (in weeks) was 9.3(Table 1).

Table (1): Descriptive data of the recruited participants(no= 27)

Item	Frequency (no=27)	Percentage				
Age (in years)						
Mean ± SD	29.7±6.1					
Min- max	20-40					
Median (IQ)	29.5(24-35)					
BMI (Kg/m ²)						
Mean \pm SD	24.5±4.2					
Min- max	19-33					
Median (IQ)	27(23-30)					
Parity						
Mean \pm SD	2.8±1.7					
Range	1-5					
Fetal cardiac pulsation						
Positive	17	63%				
Negative	10	37%				
Gestational age (in weeks)						
Mean \pm SD	9.3±1.3					
Min- max	6-13					
Median (IQ)	10(9-11)					
Number of						
previous CS						
Mean \pm SD	2.3±1.3					
Range	1-4					
Basal B hCG (m						
IU/ml)						
Mean \pm SD	13000±3500					
Range	5000-132000					
Hospital stays (days)						
Mean \pm SD	3.8±1.5					
Range	1-7					

Table (2) showed management outcome in the recruited participants. Expectant management (3) cases: All cases were complicated and needed second intervention. Systemic methotrexate (6) cases: Success percentage was 33.3% and complication percentage was 16.7%. Local intragestational methotrexate (4) cases: Success percentage was 75% and complication percentage was16.7%. Suction evacuation (5) cases: Success percentage was 80% and complication percentage was 20%. U/S-guided D+C (4) cases: Success percentage was 75% and complication percentage was 50%. Surgical Excision (hysterotomy) (5) cases: Success percentage was 20%.

Route of management	Successful cases	Failed cases OR need	Success percentage	Complication percentage	Type of complication
		second intervention			
Expectant (n=3)	ZERO	3	zero	100%	2 cases of rupture ectopic +blood transfusion 1 case turned to PAS
Systemic methotrexate (n=6)	2	4	33.3%	16.7%	1 case needed blood transfusion
Local intragestational methotrexate (n=4)	3	1	75%	25%	1 case needed blood transfusion
Suction evacuation (n=5)	4	1	80%	20%	1 case needed blood transfusion
U/S guided D+C (n=4)	3	1	75%	50%	1 cases perforation +1 case blood transfusion
Surgical excision (hysterotomy). (n=5)	5	zero	100%	20%	1 case needed blood transfusion

 Table (2): Management outcome among recruited patients (n=27)

DISCUSSION

The CSEP is a condition in which an early pregnancy implants in a prior Cesarean scar. Its occurrence has increasingly grown worldwide, which might be attributed to rising Cesarean birth rates, better awareness of the illness, and improved diagnostic facilities.

In this study, mean maternal age was 29.7 years, mean BMI was 26.5 Kg/m², mean parity was 2.8 and mean gestational age (in weeks) was 9.3. This is similar to **Gerday** *et al.* ⁽¹⁰⁾ study, mean age was 36.5 years and the mean gestational age was 8 w.

In this study, expectant management failed in all cases and all cases were complicated. This is in line with **Timor** *et al.* ⁽¹¹⁾ study where they said that treating CSEP during pregnancy has a high risk of serious complications, including uterine rupture, placenta accreta spectrum, hysterectomy with infertility, severe bleeding, and even maternal death.

Systemic methotrexate: In this study systemic methotrexate was used in management of 6 cases with Success percentage of 33.3% and complication percentage of 16.7% mostly hemorrhage. This is in line with Harb et al. (12) study where they stated that success rate of systemic Methotrexate therapy was 46% (7/15) and the complication rate was 60%. Kaelin et al. (13) study showed that methotrexate success rate was 38 of 64 cases (59.3%) and complication rate was substantially lower (23%). In contrast, Salari et al. (14) in systematic review of methotrexate therapy for CSPs that comprised 600 individuals showed a success rate of 90.7% and a complication rate of 9% but with a large heterogeneity among the studies. Also, a recent study by Timor-Tritsch et al. (11) revealed a 62.1% complication rate with systemic methotrexate.

Local methotrexate: In this study, local intragestational methotrexate was used in management

of 4 cases with success percentage of 75% and complication percentage of 25%. The findings are consistent with prior research, which indicated that a local gestational sac injection is a good therapy option for early first trimester CSPs. **Gerday** *et al.* ⁽¹⁰⁾ and **Timor-Tritsch** *et al.* ⁽¹¹⁾ said that patients treated with intragestational sac injections of methotrexate were satisfactorily treated and no problems occurred. **Kaelin** *et al.* ⁽¹³⁾ study showed that local methotrexate success rate was 74.5% and complication rate was 9.5%. Additionally, according to **Cheung's** ⁽¹⁵⁾ research, 73.9% of patients who received intragestational methotrexate for CSEP were successful.

Dilatation and curettage: In this study, U/S-guided D+C was used in management of 4 cases with success percentage of 75% and complication percentage of 50%.

Due to its failure to fully reach and remove trophoblastic tissue outside of the uterine cavity and its potential to infiltrate blood vessels, curettage alone, without adjuvant therapies, has been linked to significant complication rates, including bleeding and perforation. This is consistent with a research by **Timor-Tritsch** *et al.* ⁽¹¹⁾ who found a 62.9% complication rate for dilatation and curettage, with bleeding issues being the main cause of this increased complication rate.

Suction and evacuation: In this study, suction evacuation was used in management of 5 cases with success percentage of 80% and complication percentage of 20%. This is consistent with the systemic review and meta-analysis of 22 trials including 374 CSP patients conducted by **Maymon** *et al.* ⁽¹⁶⁾. Similar to the results of this trial, the review indicated a 92.2% success rate for suction evacuation therapy. Additionally, a research by **Verberkt** *et al.* ⁽¹⁷⁾ found that suction curettage had great success rates, a blood transfusion rate of 4.7%, and

one instance of a hysterectomy brought on by bleeding. 6% of patients required further surgery as a result of retained fetal products. **Kaelin** *et al.* ⁽¹³⁾ study showed that suction evacuation success rate was 91.5% and complication rate was 8.5%.

Surgical excision (hysterotomy): In this study, hysterotomy was used in management of 5 cases with success percentage of 100% and complication percentage of 20%. This is like to **Timor-Tritsch** *et al.* ⁽¹¹⁾ who reported that surgical excision had a high success rate with complication rate of 28.6% and study of **Kaelin** *et al.* ⁽¹³⁾, which showed that surgical excision success rate was 91.8% and complication rate was 13.5%. Reproximating the surrounding myometrium after CSEP removal allows for the elimination of scar tissue, which is a benefit of hysterotomy ⁽¹⁷⁾.

LIMITATION

This study was a single center nonrandomized study with small sample size. This may be due to low incidence of the condition. Also, this study didn't evaluate all management options of CSEP due to limited facilities and small sample size.

CONCLUSION

It could be concluded that active management of Cesarean scar ectopic surgically or through local methotrexate injection had a better success rate than systemic methotrexate and expectant management.

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